KIRAN INSTITUTE OF CAREER EXCELLENCE

2022 CBE COMPUTER BASED EXAM

SSC CGL

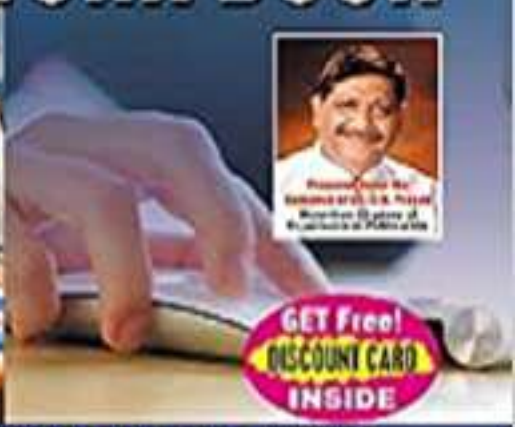
COMBINED GRADUATE LEVEL

TIER-II ONLINE EXAM

Quantitative Abilities and English Language & Comprehension

PRACTICE WORK BOOK

INCLUDING SOLVED PAPERS OF
2019-21 (22)



GET Free! DISCOUNT CARD INSIDE

FOR DAILY CURRENT AFFAIRS
VISIT currenthunt.com

PRACTICE ON MOBILE
Download Our App
KICX App

Or Download Scan QR Code

Kiran's

SSC CGL

COMBINED GRADUATE LEVEL

TIER-II ONLINE EXAM

PRACTICE WORK BOOK

QUANTITATIVE ABILITIES & ENGLISH LANGUAGE & COMPREHENSION

INCLUDING SOLVED PAPER OF 2018-19-20 & 21

TOTAL 36 SETS

22 MODEL PRACTICE SETS (PAPER-I & II)

- SSC CGL TIER-II (CBE) Exam, 19.02.2018 (Paper-I & II)
- SSC CGL TIER-II (CBE) Exam, 20.02.2018 (Paper-I & II)
- SSC CGL TIER-II (CBE) Exam, 11.09.2019 (Paper-I & II)
- SSC CGL TIER-II (CBE) Exam, 12.09.2019 (Paper-I & II)
- SSC CGL TIER-II (CBE) Exam-2021, (15.11.2020) (Paper-I & II)
- SSC CGL TIER-II (CBE) Exam-2021, (29.01.2022) (Paper-I & II)
- SSC CGL TIER-II (CBE) Exam-2021, (03.02.2022) (Paper-I & II)

For Franchisee Contact :

KIRAN INSTITUTE OF CAREER EXCELLENCE PVT. LTD.

RU-67, PITAMPURA, DELHI-110034, Ph : 9821874015, 9821643815

CGL/T-II/PWE–1

Delhi : RU-67,
Opposite Power House,
Pitampura, Delhi-110034,
Ph. : 9821874015,
9821643815
www.kiranprakashan.com

NEW EDITION

Reviewed by : **Think Tank of PRATIYOGITA KIRAN, KIRAN PRAKASHAN & KICX**
Assistance : ● **Govind Pd. Singh** ● **Rakesh Kumar** ● **Auranjeb Khan** ● **Sanket Sah**
Design & Layout by : **KICX COMPUTER SECTION,** New Delhi.

About the Book.....

It has truly been opined that change is constant. Staff Selection Commission introduced some salient changes in SSC Combined Graduate Level Exam 2011. An element of integration was formulated and a variety of jobs were brought under one umbrella. Pattern of exam was changed and questions got objective form. Aspirants readily accepted the change. Kiran Prakashan as usual was loaded with a responsibility to be discharged on its part. There was no bit of escapism and **SSC Combined Graduate Level Tier-II Online Exam Practice Work Book (Quantitative Abilities and English Language & Comprehension)** was published that was gladly embraced by the agile aspirants as it well suited the needs of the said exam.

In 2013 SSC Graduate Level Exam, again a change appears. The syllabus of Quantitative Abilities (Arithmetical Ability) of Graduate Level Tier-II Exam, 2013 is enlarged. The notable topics that have been included are : **Lines and Angles; Similarity and Congruence of Triangles; Quadrilaterals; Circles and their Chords and Tangents; Circular Measure of Angles; Trigonometric Identities and Heights and Distances** etc. These topics are significant keeping in view the enormity of candidates, significance of Arithmetical Ability in deciding the result and complexity of competition. It gives ample view to concentrate on these new topics alongwith other topics in the syllabus as every topic is important. The book in your hand is entirely based on the latest syllabus prescribed by the SSC. In 2016, again a remarkable change had been brought i.e. online exam.

We have presented **36 Sets (22 Model Practice Sets & 14 Solved Papers)** including **Solved Papers of SSC Combined Graduate Level Tier-II (Paper-I & II) Exam was held from 2018 to 2021.**

You have made comprehension of nature of questions and strengthened your foundation. Then, a severe need arises. That is to use the skill to gain expertise. This will be possible only when you practise with utmost sincerity. Hence, our last endeavour was to prepare Model Practice Sets. It was really a tedious job. Every set is consequent of sincere effort, minute analysis and clarity of inference. You get upgraded questions that certainly bear relation with the previous graduate level exams conducted by Staff Selection Commission including various graduate level exams. It is most likely that the questions in the said exam might have resemblance with these questions. Care has been taken that every set is complete in itself and exhibits perfection. You get short answers to check your solution and explanations to remove confusion and sharpen the edge of knowledge. In this way you move on the path of complete preparation and acquire SPEED and ACCURACY – a vital key to succeed in exams of today. Always remember, Quantitative Abilities and English Language & Comprehension will play role as the Lord of Planets – Jupiter – plays in our fortune. Hence, a candidate should be attentive of this fact. Ignorance of the fact will have no excuse.

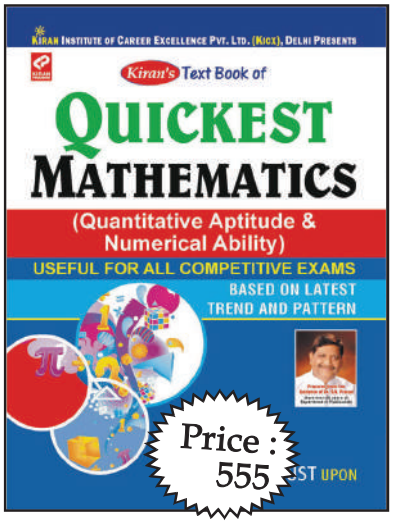
This very view has been shaped while preparing a Model Practice Set. Every topic of prescribed syllabus occupies its space and a proportional representation gets formulated. New topics get their share profoundly. Every Set is followed by short answers and then by explanations. A Quicker Approach has been adopted in giving solution to a problem as it will save time. A candidate needs only a continuous practice as it will raise his/her confidence level. His/her comprehension of the Subject gets sharpened. A sharp knife cuts the apple in no time and with least effort. Thus the book gets its totality. We believe it will add to your expertise. Your endeavours synthesised with skill will get rewarded.

Best Wishes for Forthcoming Exams

— Satya Narayan Prasad
Email : sanket_2000us@yahoo.com

6th REVISED AND ENLARGED EDITION

This book is a comprehensive package that covers the syllabi of almost all Competitive Examinations, almost all the topics from which questions are asked or from which questions may be asked in competitive examinations. Each chapter has been discussed in detail. Revision and updation have been done after scientific analysis of trend of the questions asked in recent exams. For instance, nowadays Algebra, Geometry and Trigonometry are accorded more weightage in the various examinations conducted by Staff Selection Commission. An indepth analysis of the questions asked in various competitive examinations reveals that mere knowledge of mathematical formulae does not serve the purpose. One needs to have clarity of concept and ability to perceive their applicability. Each chapter has been strategically dealt in order to make it easier for you to grasp the subject. The beginning of each chapter defines the topic and explains the fundamental concepts of the subject.



SALIENT HIGHLIGHTS :

- Comprehensive Coverage of Syllabi of almost all Competitive Exams.
- Revised Edition based on analysis of the trend of latest questions of various exams.
- Fundamental concepts dealt in detail with illustrative examples.
- Derivation of Short-cut methods and tricks from fundamentals and their applications.
- Problem-solving by Traditional as well as Tricky/short-cut methods.
- Wide variety of questions covered on each topic.
- Inclusion of questions based on the latest pattern of examinations.
- Exhaustive solved problems in each chapter.
- Caution notes on grey areas prone to common error.
- Wide coverage of previous years' solved problems.
- Frequently used Rules and Formulae marked in boxes.
- A unique approach to Data Sufficiency and Data Analysis & Data Interpretation.

A NEW INTRODUCTION ON HIGH DEMAND

Kiran's Quickest Mathematics Practice Work Book

- It is truly said, " Practice makes a man Perfect" and there can be no better example than Mathematics to suffice this golden rule.
- Keeping alive this spirit, we consciously and cautiously and cautiously decided to have a separate but synergised publication, "Kiran's Practice Work Book on Quickest Mathematics" that serves the very objective of readers elegantly.
- It provides ample opportunity to the Readers of Quickest Mathematics as well other aspirants to hone their skills and apply the Tricky methods.
- It can also work as a tool to review and rate your preparation.
- In this book Answers and Explanations have been provided separately - to make you feel the essence of real exam.
- It will certainly help you identify your Strength and Weaknesses and take remedial steps.

CHAPTERS

1. Numbers **2.** Binary Number System **3.** Addition and Subtraction **4.** Vedic Mathematics **5.** Multiplication **6.** Division **7.** Divisibility **8.** LCM and HCF **9.** Decimal & Fraction **10.** Power and Roots – Square, Cube - Indices, Surds **11.** Algebra **12.** Simplification **13.** Percentage **14.** Profit and Loss **15.** Average **16.** Ratio and Proportion **17.** Alligation or Mixture **18.** Partnership **19.** Problems Based on Ages **20.** Simple Interest **21.** Compound Interest **22.** Time and Work **23.** Work and Wages **24.** Pipes and Cistern **25.** Time and Distance **26.** Trains **27.** Boats and Streams **28.** Races and Games **29.** Geometry : Lines, Angles **30.** Triangles **31.** Quadrilaterals **32.** Circles **33.** Area and Perimeter **34.** Volume and Surface Areas (3-Dimensional Figures) **35.** Trigonometry **36.** Height and Distance **37.** Series **38.** Progression and Sequence **39.** Permutation and Combination **40.** Probability **41.** Logarithms **42.** Calendar **43.** Clocks **44.** Data Analysis **45.** Data Sufficiency **46.** Data Interpretation

CONTENTS

MODEL PRACTICE SETS

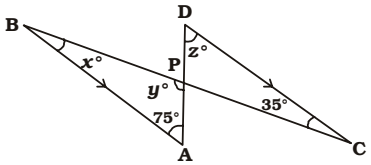
SOLVED PAPERS

SET 1 MODEL PRACTICE SET

PAPER–I ♦ Marks : 200 ♦ No. of Questions : 100 ♦ Time : 2 Hrs.

QUANTITATIVE ABILITIES

1. In the given figure, $AB \parallel CD$, then the values of x, y and z are respectively :



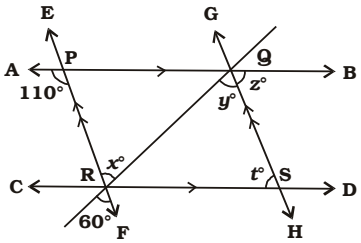
(1) 75°, 35°, 80°
(2) 70°, 35°, 60°
(3) 35°, 70°, 75°
(4) 70°, 35°, 80°

2. Five cubes each of edge 4cm, are joined end to end. What is the total surface area of the resulting cuboid ?
(1) 352 cm^2 (2) 486 cm^2
(3) 720 cm^2 (4) 526 cm^2

3. If $a^3 - b^3 = 208$ and $a - b = 4$, then $(a + b)^2 - ab$ is equal to :
(1) 52 (2) 38
(3) 32 (4) 42

4. Mr. Dutta desired to deposit his retirement benefit of Rs. 3 lacs partly to a post office and partly to a bank at 10% and 6% interests respectively. If his monthly interest income was Rs. 2000, then the difference of his deposits in the post office and in the bank was :
(1) Rs. 50,000
(2) Rs. 40,000
(3) Nil
(4) Rs. 1,00,000

5. In the given figure, $AB \parallel CD$ and $EF \parallel GH$. The values of x, y, z and t are respectively :



(1) 60, 75, 75, 60
(2) 50, 75, 75, 65
(3) 60, 70, 60, 70
(4) 60, 60, 70, 70

6. If $\tan x = \cot (45° + 2x)$. then what is the value of x?
(1) 45° (2) 15°
(3) $\frac{45°}{2}$ (4) 20°

7. $\frac{675 \times 675 \times 675 + 325 \times 325 \times 325}{67.6 \times 67.5 + 32.5 \times 32.5 - 67.5 \times 32.5}$ is equal to :
(1) 100 (2) 10,000
(3) 1,000 (4) 1,00,000

8. A sum of Rs. 20,000 is invested for 15 months at the interest of 10% per annum compounded half yearly. What is the percentage gain, correct to one decimal place, at the end of 15 months ?
(1) 12.5% (2) 13.6%
(3) 13.0% (4) 13.4%

9. What is the sum of digits of the least number, which when divided by 15, 18 and 24 leaves the remainder 8 in each case and is also divisible by 13 ?
(1) 17 (2) 16
(3) 15 (4) 18

10. From the top of a 10 metre high building, the angle of elevation of the top of a tower is 60° and the angle of depression of the foot of the tower is ϕ, such that $\tan \phi = \frac{2}{3}$. What is the height of the tower to nearest metre ?
(1) 34 metre (2) 35 metre
(3) 36 metre (4) 33 metre

11. A wire when bent in the form of a square encloses an area of 484 sq. cm. What will be the enclosed area when the same wire is bent into the form of a circle?
(Take $\pi = \frac{22}{7}$)
(1) 462 sq.cm (2) 539 sq.cm
(3) 616 sq.cm (4) 693 sq.cm

12. If $7x + 2 \geq x - 2$ and $7 + 2x \geq 3 + 3x$; then x can take which of the following values ?
(1) 5 (2) 3
(3) –3 (4) –5

13. $\sin \frac{\pi}{4} \cos \frac{\pi}{12} - \cos \frac{\pi}{4} \sin \frac{\pi}{12}$ is equal to
(1) $\frac{1}{\sqrt{3}}$ (2) $\sqrt{3}$
(3) $\frac{\sqrt{3}}{2}$ (4) $\frac{1}{2}$

14. If $\sqrt{4096} = 64$, then the value of $\sqrt{40.96} + \sqrt{0.4096} + \sqrt{0.004096} + \sqrt{0.00004096}$ up to two places of decimals is :
(1) 7.09 (2) 7.10
(3) 7.11 (4) 7.12

15. If the six digit number $4x4y96$ is divisible by 88, then what will be the value of $(x + 2y)$?
(1) 13 (2) 10
(3) 12 (4) 11

16. The value of $\frac{1}{1 + \sqrt{2} + \sqrt{3}} + \frac{1}{1 - \sqrt{2} + \sqrt{3}}$ is :
(1) $\sqrt{2}$ (2) $\sqrt{3}$
(3) 1 (4) $4\left(\sqrt{3} + \sqrt{2}\right)$

17. The line passing through point (–3, 1) and point (x, 5) is parallel to the line passing through point (–2, –1) and point (6, 3). What is the value of x ?
(1) –5 (2) –2
(3) 2 (4) 5

18. The efficiencies of A, B and C are in the ratio 4 : 5 : 6. Working together, they can complete a work in 12 days. In how many days will A alone be able to complete that work ?
(1) 45 (2) 36
(3) 30 (4) 40

19. If $x + \frac{1}{x} = 5$, then $x^3 + \frac{1}{x^3}$ is equal to :
(1) 110 (2) 130
(3) 145 (4) 125

20. Two pipes A and B can fill a tank in 6 hours and 9 hours respectively. They are opened alternately for 1 hour each, starting with pipe A first. In how many hours will the tank be filled?
(1) 5 (2) 4
(3) 6 (4) 7

21. The value of $\frac{\cos 11° + \sin 11°}{\cos 11° - \sin 11°}$ is
(1) tan 56° (2) tan 32°
(3) tan 55° (4) tan 40°

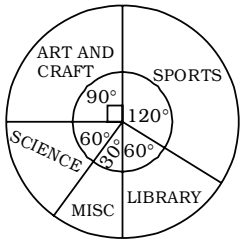
22. If $\Delta ABC \sim \Delta QPR$, $\frac{ar(ABC)}{ar(\Delta PQR)} = \frac{9}{4}$, AC = 12cm, AB = 18 cm and BC = 15 cm, then PR is equal to :
(1) $\frac{20}{3}$cm (2) 12 cm
(3) 8 cm (4) 10 cm

23. If $x = a \sec\theta \cos\phi$, $y = b \sec\theta \sin\phi$, $z = c \tan\theta$, then, the value of $\frac{x^2}{a^2} + \frac{y^2}{b^2} - \frac{z^2}{c^2}$ is :
(1) 1 (2) 4
(3) 9 (4) 0

24. The price of sugar has decreased by 15%. By what percentage can a person increase the consumption so that there is no change in the expenditure ?
(1) $\frac{300}{23}\%$ (2) $\frac{300}{17}\%$
(3) $\frac{50}{3}\%$ (4) $\frac{20}{3}\%$

25. If a number x is 10% less than another number y and y is 10% more than 125, then x is equal to :
(1) 150 (2) 143
(3) 140.55 (4) 123.75

Directions (26–30) : The pie chart shows how the school funds is spent under different heads in a certain school. Using the pie chart answer the questions.



Misc. Miscellaneous

26. What percentage of the total expense is spent on library?
(1) 24.3 (2) 24
(3) 20 (4) 16.6

27. Which head uses 25% of the funds?
(1) Sports
(2) Misc
(3) Library
(4) Art and Craft

28. Which heads have the same amount of expenditure?
(1) Library and Science
(2) Sports and Science
(3) Science and Misc
(4) Misc and Library

29. Which head has the maximum expenditure?
(1) Art and Craft
(2) Sports
(3) Library
(4) Science

30. What is the ratio of expenditure on sports to that on art and craft?
(1) 1 : 1 (2) 4 : 3
(3) 1 : 4 (4) 2 : 1

31. The average age of 30 boys in a class is 15 years. One boy, aged 20 years, left the class, but two new boys came in his place whose ages differ by 5 years. If the average age of all the boys now in the class becomes 15 years, the age of the younger newcomer is :
(1) 20 years (2) 15 years
(3) 10 years (4) 8 years

32. $9\frac{3}{4} \div \left[2\frac{1}{6} + \left\{4\frac{1}{3} - \left(2\frac{1}{2} + \frac{3}{4}\right)\right\}\right]$ is equal to :
(1) 3 (2) $\frac{15}{4}$
(3) 4 (4) $\frac{17}{4}$

33. If ABCD is a rhombus, then :
(1) $AC^2 + BD^2 = 4\ AB^2$
(2) $AC^2 + BD^2 = AB^2$
(3) $AC^2 + BD^2 = 2\ AB^2$
(4) $2\ (AC^2 + BD^2) = 3\ AB^2$

34. A sphere of radius 6 cm is melted and recast into spheres of radius 2 cm each. How many such spheres can be made ?
(1) 36 (2) 25
(3) 27 (4) 24

35. The average of 16 numbers is 48. The average of the first 7 numbers is 45 and the average of the next 6 numbers is 52. If the 14th number is 11 less than the 15th number and is 5 more than the 16th number, then the average of the 15th and 16th number is :
(1) 47.5 (2) 48.5
(3) 49 (4) 48

36. If $(x-5)^3 + (x-6)^3 + (x-7)^3 = 3(x-5)(x-6)(x-7)$, then what is the value of x?
(1) 6 (2) 7
(3) 5 (4) 18

37. A hemisphere and a cone have equal bases. If their heights are also equal, the ratio of their curved surfaces will be :
(1) $1 : \sqrt{2}$ (2) $\sqrt{2} : 1$
(3) 1 : 2 (4) 2 : 1

38. The diameter of a 120 cm long roller is 84 cm. It takes 500 complete revolutions of the roller to level a ground. The cost of levelling the ground at Rs. 1.50 per sq. m. is :
(1) Rs. 6000 (2) Rs. 3762
(3) Rs. 2376 (4) Rs. 5750

39. A shopkeeper marks his goods at a price such that after giving a discount of 25%, he gains 20%. If the cost price of the article is Rs. 460, what is its marked price ?
(1) Rs. 736 (2) Rs. 748
(3) Rs. 725 (4) Rs. 752

40. A point O in the interior of a rectangle ABCD is joined with each of the vertices A, B, C and D. Then :
(1) OB + OD = OC + OA
(2) $OB^2 + OA^2 = OC^2 + OD^2$
(3) OB . OD = OC . OA
(4) $OB^2 + OD^2 = OC^2 + OA^2$

41. If $a^x = b$, $b^y = c$ and $x\,y\,z = 1$, then the value of c^z will be
(1) a (2) b
(3) $a\,b$ (4) a^2

42. If $a = \frac{\sqrt{3}-\sqrt{2}}{\sqrt{3}+\sqrt{2}}$ and $b = \frac{\sqrt{3}+\sqrt{2}}{\sqrt{3}-\sqrt{2}}$, then the value of $a^2 + b^2 - 5ab$ will be
(1) 93 (2) 92
(3) 91 (4) 90

43. If $a + b + c = 9$ and $ab + bc + ca = 40$, then the value of $a^2 + b^2 + c^2$ will be
(1) –1 (2) 2
(3) 0 (4) 1

44. A and B have monthly incomes in the ratio 5 : 6 and monthly expenditures in the ratio 3 : 4. If they save Rs. 1800 and Rs. 1600 respectively, find the monthly income of B :
(1) Rs. 3400 (2) Rs. 2700
(3) Rs. 1720 (4) Rs. 7200

45. If $3x + 5(4 - 3x) > 2 - 4x < 3x - \frac{x}{3}$; then the value of x is
(1) 3 (2) 0
(3) 2 (4) –1

46. Arrange the following in descending order : $\sqrt[3]{4}$, $\sqrt{2}$, $\sqrt[6]{3}$, $\sqrt[4]{5}$
(1) $\sqrt[3]{4} > \sqrt[4]{5} > \sqrt{2} > \sqrt[6]{3}$
(2) $\sqrt[4]{5} > \sqrt[3]{4} > \sqrt[6]{3} > \sqrt{2}$
(3) $\sqrt{2} > \sqrt[6]{3} > \sqrt[3]{4} > \sqrt[4]{5}$
(4) $\sqrt[6]{3} > \sqrt[4]{5} > \sqrt[3]{4} > \sqrt{2}$

47. Find the area which is formed by three lines $2x + 4y = 12$, $3x + 2y = 6$ and x-axis
(1) 6 sq. unit
(2) 4 sq. unit
(3) 8 sq. unit
(4) 3 sq. unit

48. From a window (h metres high above the ground) of a house in a street, the angle of elevation and depression of the top and the foot of another house on the opposite side to the street are θ and ϕ respectively. Then, the height of the opposite house is
(1) $h \cot\theta \cot\phi$
(2) $h[\cot\theta \cot\phi + 1]$
(3) $h \tan\theta \cot\phi$
(4) $h[\tan\theta \cot\phi + 1]$

49. $\sqrt{2+\sqrt{2+\sqrt{2+2\cos 8\theta}}}$ equal to
(1) $2\sin\theta$ (2) $2\cos\theta$
(3) $2\sec\theta$ (4) $2\tan\theta$

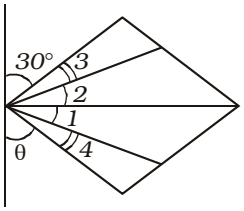
50. If $2\cos\theta = x + \frac{1}{x}$, then $2\cos 3\theta$ equals to
(1) $x^3 + \frac{1}{x^3}$ (2) $x^2 + \frac{1}{x^2}$
(3) $x^3 - \frac{1}{x^3}$ (4) $x^2 - \frac{1}{x^2}$

51. If $\cos\theta + \cos(120° + \theta) + \cos(\theta - 120°) = 0$, then $\cos^3\theta + \cos^3(120° + \theta) + \cos^3(\theta - 120°)$ equals to
(1) $\frac{3}{4}\cos\theta$ (2) $\frac{3}{4}\cos^2\theta$
(3) $\frac{3}{4}\cos 3\theta$ (4) $\frac{3}{4}\sin 3\theta$

52. A boy aged 12 years is left with Rs. 100,000 which is under a trust. The trustees invest the money at 6% per annum and pay the minor boy a sum of Rs. 2500, for his pocket money at the end of each year. The expenses of trust come out to be Rs. 500 per annum. Find the amount that will be handed over to the minor boy after he attains the age of 18 years.
(1) Rs. 120000
(2) Rs. 150000
(3) Rs. 118000
(4) Rs. 125000

53. A 1.5m tall boy is standing at some distance from a 30m tall building. The angle of elevation from his eyes to the top of the building increases from 30° to 60° as he walks towards the building. The distance he walked towards the building will be
(1) $18\sqrt{3}\,m$ (2) $\frac{18}{\sqrt{3}}\,m$
(3) $19\sqrt{3}\,m$ (4) $\frac{19}{\sqrt{3}}\,m$

54. In the given figure $\angle 2 = \angle 1$ and $\angle 3 = \angle 4$. The value of θ equals to



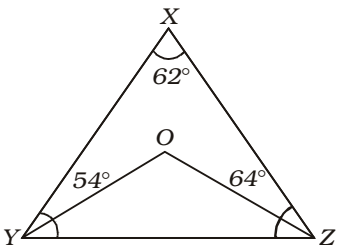
(1) 30° (2) 60°
(3) 45° (4) 40°

55. The bisector of $\angle B$ of an isosceles triangle ABC with AB = AC meets the circum circle of ΔABC at P. If AP and BC produced meet at Q, then CQ equals to
(1) CA (2) $\frac{CA}{2}$
(3) 2CA (4) $\frac{3}{2}CA$

56. If the price of rice is reduced by 20%, one can buy 2 kg more for Rs. 100. The reduced price of rice is :
(1) Rs. 50 per kg.
(2) Rs. 10 per kg.
(3) Rs. 40 per kg.
(4) Rs. 5 per kg.

57. If I would have purchased 11 articles for Rs. 10 and sold all the articles at the rate of 10 for Rs. 11, the profit per cent would have been :
(1) 10% (2) 11%
(3) 21% (4) 100%

58. In the given figure, $\angle X = 62°$, $\angle XYZ = 54°$. If YO and ZO are the bisectors of $\angle XYZ$ and $\angle XZY$, then the values of $\angle OZY$ and $\angle YOZ$ will be



(1) 32°, 120° (2) 32°, 121°
(3) 30°, 120° (4) 121°, 32°

59. An article is sold at a loss of 10%. Had it been sold for Rs. 9 more, there would have been a gain of $12\frac{1}{2}\%$ on it. The cost price of the article is :
(1) Rs. 40 (2) Rs. 45
(3) Rs. 50 (4) Rs. 35

60. A dealer offers a discount of 10% on the marked price of an article and still makes a profit of 20%. If its marked price is Rs. 800, then the cost price of the article is :
(1) Rs. 900 (2) Rs. 800
(3) Rs. 700 (4) Rs. 600

61. ABC is an isosceles triangle with AB = AC. A circle through B touching AC at the middle point intersects AB at P. Then AP : AB is :
(1) 4 : 1 (2) 2 : 3
(3) 3 : 5 (4) 1 : 4

62. The marked price of a watch is Rs. 1000. A retailer buys it at Rs. 810 after getting two successive discounts of 10% and another rate which is illegible. What is the second discount rate?
(1) 15% (2) 10%
(3) 8% (4) 6.5%

63. A motor boat covers a certain distance downstream in a river in 3 hours. It covers the same distance upstream in 3 hours and a half. If the speed of water is 1.5 km/h, then the speed of the boat in still water is :
(1) 17 km/h (2) 19.5 km/h
(3) 17.5 km/h (4) 19 km/h

64. The area of a trapezium whose parallel sides are 55 cm and 40 cm and non parallel sides are 20 cm and 25 cm is
(1) 900 cm^2 (2) 950 cm^2
(3) 1000 cm^2 (4) 1050 cm^2

65. Water is flowing at the rate of 5 km/h through a pipe of diameter 14 cm into a rectangular tank which is 50 m long and 44 m wide. The time in which the level of water in the tank will rise by 7 cm is
(1) 8 hr (2) 7 hr
(3) 4 hr (4) 5 hr

66. A train passes two bridges of lengths 800 m and 400 m in 100 seconds and 60 seconds respectively. The length of the train is :
(1) 80 m (2) 90 m
(3) 200 m (4) 150 m

67. Two cones with same base radius 8 cm and height 15 cm are joined together along their bases. The surface area of the shape so formed is
(1) 840 cm^2 (2) 820 cm^2
(3) 855 cm^2 (4) 810 cm^2

68. The divisor is 25 times the quotient and 5 times the remainder. If the quotient is 16, the dividend is :
(1) 6400 (2) 6480
(3) 400 (4) 480

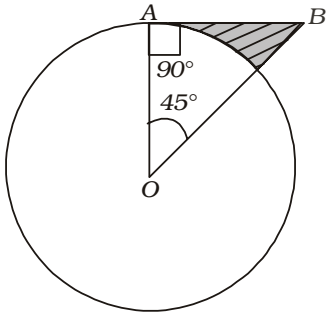
69. Find the least multiple of 23, which when divided by 18, 21 and 24 leaves the remainder 7, 10 and 13 respectively.
(1) 3013 (2) 3024
(3) 3002 (4) 3036

70. If $x(x + y + z) = 20$, $y(x + y + z) = 30$, and $z(x + y + z) = 50$, then the value of $2(x + y + z)$ is :
(1) 20 (2) –10
(3) 15 (4) 18

71. Two posts are 'k' metre apart and the height of one is double that of the other. If from the middle point of the line joining their feet, an observer finds the angular elevations of their tops to be complementary, then the height (in metre) of the shorter post is
(1) $k/2$ (2) $\frac{k}{2\sqrt{2}}$
(3) k
(4) None of these

72. Find the greatest number of five digits which when divided by 3, 5, 8, 12 have 2 as remainder :
(1) 99999 (2) 99958
(3) 99960 (4) 99962

73. AB is a tangent to a circle. The radius of circle is 2 cm. The area of shaded portion is

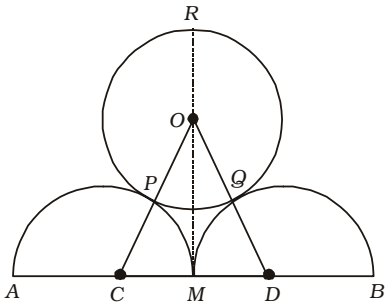


(1) $\left(2-\frac{\pi}{2}\right)cm^2$
(2) $\left(\frac{\pi}{2}-2\right)cm^2$

(3) $\left(4-\frac{\pi}{2}\right)$ cm²

(4) $\frac{\pi}{2}-4$ cm²

74. AB is a line segment and M is its mid-point. Semi circles are drawn with AM, MB and AB as diameters on the same side of line AB. A circle C (0, r) is drawn so that it touches all the three semicircles. Then *r* is equal to :



(1) $\frac{AB}{4}$ (2) $\frac{2AB}{5}$

(3) $\frac{AB}{6}$

(4) None of these

75. If 5 men or 8 women can do a piece of work in 12 days, how many days will be taken by 2 men and 4 women to do the same work?

(1) 15 days (2) $13\frac{1}{2}$ days

(3) $13\frac{1}{3}$ days (4) 10 days

76. What is the sum of the mean proportional between 10.8 and 4.8 and the third proportional of 2 and 4 ?

(1) 15.2 (2) 11.2

(3) 8.2 (4) 10.2

77. In ΔABC, ∠A = 50°. Its sides AB and AC are produced to the point D and E. If the bisectors of ∠CBD and ∠BCE meet at the point O, then ∠BOC is equal to :

(1) 70° (2) 65°

(3) 55° (4) 40°

78. Zinc and copper are in the ratio of 5 : 3 in 200 gm of an alloy. How much grams of copper be added to make the ratio as 3 : 5?

(1) $133\frac{1}{3}$ (2) $\frac{1}{200}$

(3) 72 (4) 66

79. The price of 10 chairs is equal to that of 4 tables. The price of 15 chairs and 2 tables together is Rs. 4000. The total price of 12 chairs and 3 tables is :

(1) Rs. 3750 (2) Rs. 3840

(3) Rs. 3500 (4) Rs. 3900

80. A shopkeeper sold two articles for Rs. 9471 each. On one, he gained 23% and on the other, he lost 23%. What is the overall percentage gain or loss ?

(1) 5.29% loss

(2) 6.29% gain

(3) 5.29% gain

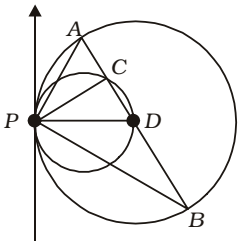
(4) 6.29% loss

81. The point Q (*a*, *b*) is first reflected in *y*–axis to Q1 and Q1 is reflected in *x*–axis to (–5, 3). The co-ordinates of point Q are

(1) (–5, –3) (2) (5, 3)

(3) (–5, 3) (4) (5, –3)

82. Two circles touch internally at a point P and a chord AB of the larger circle intersects the other circle at C and D. Then which statement is true?



(1) ∠CPA = ∠DPB

(2) ∠CPA = ∠CPD

(3) ∠DPC ~ ∠DPY

(4) ∠ACP = ∠DPB

83. 4 bells ring at intervals of 30 minutes, 1 hour, $1\frac{1}{2}$ hour and 1 hour 45 minutes respectively. All the bells ring simultaneously at 12 noon. They will again ring simultaneously at :

(1) 12 mid night

(2) 3 a.m.

(3) 6 a.m.

(4) 9 a.m.

84. A boy on being asked what $\frac{6}{7}$ of a certain fraction was, made the mistake of dividing the fraction by $\frac{6}{7}$ and so got an answer which exceeded the correct answer by $\frac{13}{70}$. Find the fraction :

(1) $\frac{2}{3}$ (2) $\frac{3}{5}$

(3) $\frac{4}{5}$ (4) $\frac{7}{9}$

85. If $2m + 2m^{+1} = 96$, then the *maximum* prime order pair form, which satisfy the given equation is

(1) 1 (2) 2

(3) 3 (4) 4

86. The list price of an electric fan is Rs. 300. If two successive discounts of 15% and 10% are allowed, its selling price would be

(1) Rs. 227.50 (2) Rs. 225

(3) Rs. 230 (4) Rs. 229.50

87. $\sqrt{2a^2+2\sqrt{6}ab+3b^2}$ equals to

(1) $\sqrt{2}a+\sqrt{3}b$ (2) $\sqrt{3a}+\sqrt{2b}$

(3) $\sqrt{2a}-\sqrt{3b}$ (4) $\sqrt{3b}-\sqrt{2a}$

88. With the vertices of a triangle ABC as centre three circles are described, each touching the other two circles externally. If the sides of the triangle are 9 cm, 7 cm, and 6 cm, then the radii of the circles are

(1) 4, 5, 2

(2) 4, 5, 6

(3) 3, 2, 3

(4) all equal to 3 cm.

89. A cistern can be filled with water by a pipe in 5 hours and it can be emptied by a second pipe in 4 hours. If both the

pipes are opened when the cistern is full, the time in which it will be emptied is :
(1) 9 hours (2) 18 hours
(3) 20 hours (4) $20\frac{1}{2}$ hours

90. A and B can do a piece of work in 10 days, B and C in 15 days and C and A in 20 days. C alone can do the work in :
(1) 60 days (2) 120 days
(3) 80 days (4) 30 days

91. A and B invest in a business in the ratio 3 : 2. If 5% of the total profit goes to charity and A's share in profit is Rs. 8,550, then total profit is
(1) Rs. 15,760 (2) Rs.15,735
(3) Rs. 14,250 (4) Rs. 15,000

92. A does half as much work as B in one sixth of the time. If together they take 10 days to complete a work, how much time shall B take to do it alone?
(1) 70 days (2) 30 days
(3) 40 days (4) 50 days

93. If one of the interior angles of a regular polygon is found to be $\frac{9}{8}$ times of one of the interior angles of a regular hexagon, then the number of sides of the polygon is :
(1) 8 (2) 14
(3) 12 (4) 10

94. If (a, b), (x, y) and $(a + x, b + x)$ are collinear, then find the relation between, a, b, x & y
(1) $ax = by$ (2) $ab = xy$
(3) $ay = bx$
(4) $a - b = x + y$

95. If $2x - 2(x - 2) < 5 - x > -2x + 2$; then the value of x is
(1) 0 (2) 2
(3) 3 (4) –4

96. The points A (3, –2), B (1, 4) and C (–2, x) are collinear. What is the value of x?
(1) 13 (2) –2
(3) 5 (4) 3

97. If $\frac{a}{b} = \frac{25}{6}$, then the value of $\frac{a^2 - b^2}{a^2 + b^2}$ is

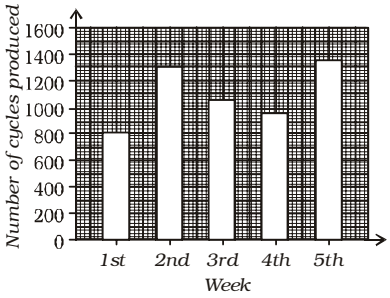
(1) $\frac{589}{661}$ (2) $\frac{661}{589}$

(3) $\frac{625}{36}$ (4) $\frac{589}{651}$

Directions (98 – 100) : Given here is a bar graph showing the number of cycles produced in a factory during five consecutive weeks.

Observe the graph and answer the questions based on this graph.

Graph showing the number of cycles produced in a factory in 5 consecutive weeks



98. The number of cycles produced during third and fourth weeks together is
(1) 1060 (2) 1980
(3) 920 (4) 1900

99. The number of cycles produced in the 5th week is
(1) 1400 (2) 1300
(3) 1440 (4) 1600

100. Total number of cycles produced in five consecutive weeks is
(1) 5520 (2) 1600
(3) 7200 (4) 7000

ANSWERS

1.(3)	**2.**(1)	**3.**(1)	**4.**(3)
5.(4)	**6.**(2)	**7.**(4)	**8.**(3)
9.(1)	**10.**(3)	**11.**(3)	**12.**(2)
13.(3)	**14.**(3)	**15.**(3)	**16.**(3)
17.(4)	**18.**(1)	**19.**(1)	**20.**(4)
21.(1)	**22.**(4)	**23.**(1)	**24.**(2)
25.(4)	**26.**(4)	**27.**(4)	**28.**(1)
29.(2)	**30.**(2)	**31.**(2)	**32.**(1)
33.(1)	**34.**(3)	**35.**(4)	**36.**(1)
37.(2)	**38.**(3)	**39.**(1)	**40.**(4)
41.(1)	**42.**(1)	**43.**(4)	**44.**(4)
45.(3)	**46.**(1)	**47.**(1)	**48.**(4)
49.(2)	**50.**(1)	**51.**(3)	**52.**(3)
53.(3)	**54.**(1)	**55.**(1)	**56.**(2)
57.(3)	**58.**(2)	**59.**(1)	**60.**(4)
61.(4)	**62.**(2)	**63.**(2)	**64.**(2)
65.(2)	**66.**(3)	**67.**(3)	**68.**(1)
69.(1)	**70.**(1)	**71.**(2)	**72.**(4)
73.(1)	**74.**(3)	**75.**(3)	**76.**(1)
77.(2)	**78.**(1)	**79.**(4)	**80.**(1)
81.(4)	**82.**(1)	**83.**(4)	**84.**(2)
85.(1)	**86.**(4)	**87.**(1)	**88.**(1)
89.(3)	**90.**(2)	**91.**(4)	**92.**(3)
93.(1)	**94.**(3)	**95.**(1)	**96.**(1)
97.(1)	**98.**(2)	**99.**(3)	**100.**(1)

EXPLANATIONS

1. (3) $x = 35°$ (acute angle)
$z° = 75°$ (acute angle)
$x + y + 75° = 180°$
(Δ *BPA*)
$= 180° - (75° + 35°)$
$y = 70°$

2. (1) Length of cuboid
$= 4 \times 5 = 20$ cm
Width = height = 4 cm
$\therefore$ Total surface area of cuboid
$= 2(l \times b + b \times h + h \times l)$
$= 2(20 \times 4 + 4 \times 4 + 4 \times 20)$ sq.m.
$= 2(80 + 16 + 80)$ sq. cm.
$= (2 \times 176)$ sq. cm.
$= 352$ sq. cm.

3. (1) Given, $a^3 - b^3 = 208$
$\Rightarrow (a - b)(a^2 + ab + b^2) = 208$

$\Rightarrow a^2 + ab + b^2 = \frac{208}{4} = 52$

$\Rightarrow (a + b)^2 - ab = 52$

4. (3) Let the amount deposited in Post Office be Rs. x lakhs.
$\therefore$ Amount deposited in bank
= Rs. $(3 - x)$ lakhs
According to the question,

$$\frac{x \times 10 \times 1}{100 \times 12} + \frac{(3 - x) \times 6 \times 1}{100 \times 12}$$

$$= \frac{2000}{100000} = \frac{1}{50}$$

$\Rightarrow 10x + 18 - 6x = \frac{1}{50} \times 1200$

$= 24$

$\Rightarrow 4x = 24 - 18 = 6$

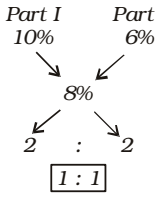
$\Rightarrow x = \frac{6}{4} = \text{Rs. } \frac{3}{2}$ lakhs

$\therefore$ Required difference = 0

Aliter :
for total sum of 3 lacs, Interest for 1 year = 2000 × 12
= Rs. 2400

$$R\% = \frac{I \times 100}{P \times T} = \frac{24{,}000 \times 100}{3{,}00{,}000 \times 1}$$

= 8%
Applying Alligation Concept



So Both the amounts are same.

5. (4) $x^\circ = 60^\circ$ (vertically opposite)
$x = y$ (acute angles)
$\Rightarrow y = 60^\circ$
$\angle PRS = 110^\circ$
$\angle QRS + x^\circ = 110^\circ$
$\angle QRS = 110^\circ - 60^\circ = 50^\circ$
$t = 180^\circ - (y + \angle QRS)$
$= 180^\circ - (60^\circ + 50^\circ)$
$t = 70^\circ$
Also $t = z$ = (acute angles)
$z = 70^\circ$

6. (2) $\tan x = \cot(45^\circ + 2x)$
$\Rightarrow \cot(90^\circ - x) = \cot(45^\circ + 2x)$
$\Rightarrow 90^\circ - x = 45^\circ + 2x$
$\Rightarrow 3x = 90^\circ - 45^\circ = 45^\circ$

$$\Rightarrow x = \frac{45^\circ}{3} = 15^\circ$$

7. (4) Let $67.5 = a \Rightarrow 675 = 10a$
and $32.5 = b \Rightarrow 325 = 10b$
$\therefore$ Expression =

$$\frac{10a \times 10a \times 10a + 10b \times 10b \times 10b}{a^2 + b^2 - ab}$$

$$= \frac{1000(a^3 + b^3)}{a^2 + b^2 - ab}$$

$$= \frac{1000(a+b)(a^2 + b^2 - ab)}{a^2 + b^2 - ab}$$

$= 1000(a + b)$
$= 1000(67.5 + 32.5)$
$= 1000 \times 100 = 100000$

8. (3) Rate = 10% p.a. = 5% per half year

$$\text{Time} = 15 \text{ months} = \frac{5}{4} \text{ years}$$

$$= \frac{5}{2} \text{ half years}$$

$$\therefore \text{Amount} = P\left(1 + \frac{R}{100}\right)^T$$

$$= 20000\left(1 + \frac{5}{100}\right)^2\left(1 + \frac{5}{100 \times 2}\right)$$

$$= 20000\left(\frac{21}{20}\right)^2\left(\frac{41}{40}\right)$$

$$= 20000 \times \frac{441}{400} \times \frac{41}{40}$$

= Rs. 22601.25
C.I. = Rs. (22601.25 – 20000)
= Rs. 2601.25
$\therefore$ Required percent

$$= \frac{2601.25}{20000} \times 100$$

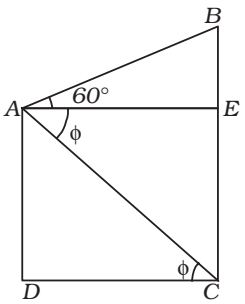
$\approx 13\%$

9. (1) LCM of 15, 18 and 24 :

2	15, 18, 24
3	15, 9, 12
	5, 3, 4

$\therefore$ LCM = 2 × 3 × 3 × 4 × 5
= 360
$\therefore$ Required number
= 360x + 8 which is divisible by 13.
Now, 360x + 8 = 13 × 27x + 9x + 8
$\therefore$ (9x + 8) must be divisible by 13.
For $x = 2$,
9x + 8 = 26 which is divisible by 13.
$\therefore$ Required number
= 360 × 2 + 8 = 728
$\therefore$ Required sum
= 7 + 2 + 8 = 17

10. (3)



AB = Height of building
= 10 metre
CD = Height of tower = h metre
AB = CE = 10 metre
$\angle DAE = 60^\circ$
$\angle EAC = \angle ACB = \phi$.
In ΔADE,

$$\tan 60^\circ = \frac{DE}{AE}$$

$$\Rightarrow \sqrt{3} = \frac{h-10}{AE}$$

$$\Rightarrow AE = \frac{h-10}{\sqrt{3}} \quad \text{...(i)}$$

In ΔABC,

$$\tan\phi = \frac{AB}{BC} \Rightarrow \frac{2}{3} = \frac{10}{BC}$$

$$\Rightarrow BC = \frac{10 \times 3}{2} = 15 \text{ metre} = AE$$

From equation (i),

$$15 = \frac{h-10}{\sqrt{3}}$$

$\Rightarrow h - 10 = 15\sqrt{3} = 15 \times 1.732$
$\Rightarrow h - 10 = 25.98$
$\Rightarrow h = 10 + 25.98$
$= 35.98 \approx 36$ metre

11. (3) Area of the square
$= (\text{side})^2$
484 sq.cm. $= (\text{side})^2$

$$\text{Side} = \sqrt{484} = 22 \text{ cm}$$

$\therefore$ Perimeter of the square
= 4 × side = 4 × 22 = 88 cm
According to the question, the circle is made by same wire.
Therefore,
Perimeter of the square
= circumference of the circle
88 cm = 2πr

$$88 \text{ cm} = 2 \times \frac{22}{7} \times r$$

$$\therefore r = \frac{88 \times 7}{2 \times 22} = 14 \text{ cm}$$

$\therefore$ Area of circle $= \pi r^2$

$$= \frac{22}{7} \times (14)^2 = \frac{22}{7} \times 14 \times 14$$

= 616 sq.cm.

12. (2) $7x + 2 \geq x - 2$
$\Rightarrow 7x - x \geq -2 - 2$
$\Rightarrow 6x \geq -4$

$$\Rightarrow x \geq -\frac{4}{6}$$

$$\Rightarrow x \geq -\frac{2}{3}$$

Again,
$7 + 2x \geq 3 + 3x$
$\Rightarrow 7 - 3 \geq 3x - 2x$
$\Rightarrow 4 \geq x$
$\therefore -\frac{2}{3} \leq x \leq 4$

13. (3) $\sqrt{\frac{\left(\sqrt{12}-\sqrt{8}\right)\left(\sqrt{3}+\sqrt{2}\right)}{5+\sqrt{24}}}$

$= \sqrt{\frac{\sqrt{36}-\sqrt{24}+\sqrt{24}-\sqrt{16}}{5+\sqrt{24}}}$

$= \sqrt{\frac{6-4}{5+\sqrt{24}}} = \sqrt{\frac{2}{5+\sqrt{24}}}$

$= \sqrt{\frac{2}{5+\sqrt{6\times 4}}} = \sqrt{\frac{2}{5+2\sqrt{6}}}$

$= \sqrt{\frac{2}{5+2\sqrt{6}} \times \frac{5-2\sqrt{6}}{5-2\sqrt{6}}}$

$= \sqrt{\frac{2\left(5-2\sqrt{6}\right)}{25-24}} = \sqrt{2\left(5-2\sqrt{6}\right)}$

$= \sqrt{2\left[\left(\sqrt{3}\right)^2+\left(\sqrt{2}\right)^2-2\sqrt{3}\sqrt{2}\right]}$

$= \sqrt{2\left(\sqrt{3}-\sqrt{2}\right)^2} = \sqrt{2}\left(\sqrt{3}-\sqrt{2}\right)$

$= \sqrt{6} - 2$

14. (3) Given $\sqrt{4096} = 64$

$\therefore \sqrt{40.96} = 6.4$

$\sqrt{0.4096} = 0.64$

$\sqrt{0.004096} = 0.064$

$\sqrt{0.00004096} = 0.0064$

Again,

$\sqrt{40.96} + \sqrt{0.4096} + \sqrt{0.004096} + \sqrt{0.00004096}$

$= 6.4 + 0.64 + 0.064 + 0.0064$
$= 7.1104 \approx 7.11$

15. (1) A number is divisible by 88 if it is divisible by 8 and 11.
The given number is divisible by 8 if y 96 is divisible by 8.
Clearly, $y = 0$ or 2
Again, for divisibility by 11,
$(6 + y + x) - (9 + 4 + 4) = 0$
$\Rightarrow 6 + x + y = 17$
$\Rightarrow x + y = 11$
$\therefore y \neq 0$ but $y = 2$
$\therefore x = 11 - 2 = 9$
$\therefore x + 2y = 9 + 4 = 13$

16. (3) Expression

$= \frac{1}{\left(1+\sqrt{3}\right)+\sqrt{2}} + \frac{1}{\left(1+\sqrt{3}\right)-\sqrt{2}}$

$= \frac{1+\sqrt{3}-\sqrt{2}+1+\sqrt{3}+\sqrt{2}}{\left(1+\sqrt{3}+\sqrt{2}\right)\left(1+\sqrt{3}-\sqrt{2}\right)}$

$= \frac{2+2\sqrt{3}}{\left(1+\sqrt{3}\right)^2-\left(\sqrt{2}\right)^2}$

$= \frac{2\left(1+\sqrt{3}\right)}{1+3+2\sqrt{3}-2}$

$= \frac{2\left(1+\sqrt{3}\right)}{2\left(1+\sqrt{3}\right)} = 1$

17. (4) Slope of the line joining points (–2, –1) and (6, 3)

$= m_1 = \frac{3-(-1)}{6-(-2)} = \frac{4}{8} = \frac{1}{2}$

Slope of the line joining ponits (–3, 1) and (x, 5)

$= m_2 = \frac{5-1}{x+3} = \frac{4}{x+3}$

Both straight lines are parallel.
$\therefore m_1 = m_2$
$\Rightarrow \frac{4}{x+3} = \frac{1}{2}$
$\Rightarrow x + 3 = 8$
$\Rightarrow x = 8 - 3 = 5$

18. (1) Ratio of the efficiencies of A, B and C = 4 : 5 : 6

Ratio of time taken = $\frac{1}{4} : \frac{1}{5} : \frac{1}{6}$

$= \left(\frac{1}{4}\times 60\right) : \left(\frac{1}{5}\times 60\right) : \left(\frac{1}{6}\times 60\right)$

[$\because$ LCM of 4, 5 and 6 = 60]
= 15 : 12 : 10

$\therefore \frac{1}{15x}+\frac{1}{12x}+\frac{1}{10x}=\frac{1}{12}$

$\Rightarrow \frac{4+5+6}{60x} = \frac{1}{12}$

$\Rightarrow \frac{1}{4x}=\frac{1}{12} \Rightarrow 4x = 12$

$\Rightarrow x = 3$

$\therefore$ Time taken by A = 15 × 3
= 45 days

19. (1) $x + \frac{1}{x} = 5$

Cubing both sides,

$\left(x+\frac{1}{x}\right)^3 = 125$

$\Rightarrow x^3 + \frac{1}{x^3} + 3\left(x+\frac{1}{x}\right) = 125$

$\Rightarrow x^3 + \frac{1}{x^3} + 3 \times 5 = 125$

$\Rightarrow x^3 + \frac{1}{x^3} = 125 - 15 = 110$

20. (4) Part of tank filled in first two hours = $\frac{1}{6}+\frac{1}{9}=\frac{3+2}{18}=\frac{5}{18}$

Part of tank filled in first 6 hours = $\frac{15}{18} = \frac{5}{6}$

Remaining part = $1 - \frac{5}{6} = \frac{1}{6}$

Now, it is the turn of A.

Time taken = $\frac{1}{6} \times 6 = 1$ hour

$\therefore$ Required time
= 6 + 1 = 7 hours

21. (1) $\frac{\cos 11^\circ + \sin 11^\circ}{\cos 11^\circ - \sin 11^\circ} = \frac{1+\tan 11^\circ}{1-\tan 11^\circ}$

$= \frac{\tan 45^\circ + \tan 11^\circ}{1 - \tan 45^\circ . \tan 11^\circ}$

$= \tan(45^\circ + 11^\circ) = \tan 56^\circ$

22. (4) $\Delta ABC \sim \Delta QPR$

$\therefore \frac{\text{Area of } \Delta ABC}{\text{Area of } \Delta PQR} = \frac{BC^2}{PR^2}$

$\Rightarrow \frac{15^2}{PR^2} = \frac{9}{4}$

$\Rightarrow PR^2 = \frac{15 \times 15 \times 4}{9}$

$= 5 \times 5 \times 4 = 100$

$\Rightarrow PR = \sqrt{100} = 100$ cm.

23. (1) $x = a \sec\theta . \cos\phi$; $y = b \sec\theta . \sin\phi$, $z = c \tan\theta$

$\therefore \frac{x^2}{a^2} + \frac{y^2}{b^2} - \frac{z^2}{c^2}$

$= \sec^2\theta . \cos^2\phi + \sec^2\theta . \sin^2\phi - \tan^2\theta$

$= \sec^2\theta(\cos^2\phi + \sin^2\phi) - \tan^2\theta$

$= \sec^2\theta - \tan^2\theta = 1$

24. (2) Required per cent

$= \frac{x}{100-x} \times 100$

$= \frac{15}{100-15} \times 100$

$= \frac{1500}{85} = \frac{300}{17}\%$

25. (4) y is 10% more than 125

$= 125 \times \frac{110}{100} = 137.5 = y$

and x is 10% less than y

$= \frac{90}{100} \times y = \frac{90}{100} \times 137.5$

= 123.75

26. (4) Corresponding angle of expenditure on library = 60°

∴ Required percent

$= \frac{60}{360} \times 100$

$= \frac{50}{3} = 16.67\%$

27. (4) ∵ 100% ≡ 360°

$\therefore 1\% \equiv \frac{360}{100}$

$\therefore 25\% \equiv \frac{360}{100} \times 25 = 90°$

⇒ Art and craft

28. (1) Corresponding angle of expense on library = 60°
Corresponding angle of expense on science = 60°

29. (2) Corresponding angle of expense on sports = 120°.

30. (2) Required ratio = 120° : 90° = 4 : 3

31. (2) Total age of 30 boys
= 30 × 15 = 450 years
One boy, aged 20 years, left the class
Now total age of 29 boys
= 450 – 20 = 430 years
Again, two new boys join the class
Then, the total age of 31 boys
= 15 × 31 = 465 years
∴ Age of two new boys
= 465 – 430 = 35 years
Let the individual ages of two boys be x and y years
∴ x + y = 35
x – y = 5 (According to the question)
∴ 2x = 40

$x = \frac{40}{2} = 20$ years

∴ y = 15 years
∴ Age of the younger new comer = 15 years
Aliter :
Resultant Age increase of the group = 15 yrs
∴ sum of the ages of two new comers = 20 + 15 = 35 yrs.
∴ $a + b = 35$, $a - b = 5$ kg
$2a = 40$ yrs
⇒ $a = 20$ yrs, $b = 15$ yrs
Age of younger new comer
=15 kg

32. (1) Expression

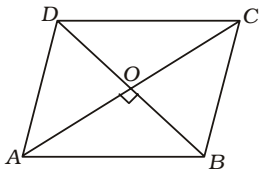
$= \frac{39}{4} \div \left[\frac{13}{6} + \frac{13}{3} - \frac{5}{2} - \frac{3}{4}\right]$

$= \frac{39}{4} \div \left[\frac{26+52-30-9}{12}\right]$

$= \frac{39}{4} \div \frac{78-39}{12}$

$= \frac{39}{4} \div \frac{39}{12} = \frac{39}{4} \times \frac{12}{39} = 3$

33. (1) As ABCD is a rhombus



So, AO = OC = $\frac{1}{2}$ AC

BO = OD = $\frac{1}{2}$ BD

∠ AOB = 90°
∴ $AB^2 = OA^2 + OB^2$

$AB^2 = \frac{AC^2}{4} + \frac{BD^2}{4}$

⇒ $4AB^2 = AC^2 + BD^2$

34. (3) Number of smaller spheres

$= \frac{\frac{4}{3}\pi R^3}{\frac{4}{3}\pi R^3} = \left(\frac{R}{r}\right)^3 = \left(\frac{6}{2}\right)^3$

$= (3)^3 = 27$

35. (4) 14th number = x
15th number = $x + 11$
16th number = $x - 5$
∴ $7 \times 45 + 6 \times 52 + x + x + 11 + x - 5 = 16 \times 48$
⇒ $315 + 312 + 3x + 6 = 768$
⇒ $3x + 633 = 768$
⇒ $3x = 768 - 633 = 135$

⇒ $x = \frac{135}{3} = 45$

∴ Required average

$\frac{x + 11 + x - 5}{2}$

$= \frac{2x+6}{2} = x + 3 = 48$

36. (1) If $a^3 + b^3 + c^3 = 3abc$, then $a + b + c = 0$
∴ $x - 5 + x - 6 + x - 7 = 0$
⇒ $3x - 18 = 0$
⇒ $3x - 18 \Rightarrow x - 6$

37. (2) According to the question
Base of hemisphere
= Base of cone
i.e. radius of hemisphere
= radius of cone ....(i)
and height of hemisphere
= height of cone ....(ii)
We know that height of hemisphere = radius of hemisphere
or, height of cone = radius of hemisphere [From (i)]
or, height of cone = radius of cone [From (ii)]
Now,
Curved surface area of hemisphere $= 2\pi r^2$
Curved surface area of cone

$= \pi r\sqrt{r^2 + h^2}$

$= \pi r\sqrt{r^2 + r^2}$ $(r = h)$

$= \pi r\sqrt{2r^2} = \pi r \times \sqrt{2}\, r$

$= \sqrt{2}\,\pi\, r^2$

∴ Ratio of curved surface areas of hemisphere and cone

$= 2\pi r^2 : \sqrt{2}\pi r^2$

$= 2 : \sqrt{2} = \sqrt{2} : 1$

38. (3) Levelled area in one revolution of roller = $2\pi rh$

$= 2 \times \frac{22}{7} \times 42 \times 120$

= 31680 sq. cm.
Area levelled in 500 revolutions
= (31680 × 500) sq. cm.
= 15840000 sq. cm.
= 1584 sq. metre

∴ Required cost
= Rs. (1584 × 1.5)
= Rs. 2376

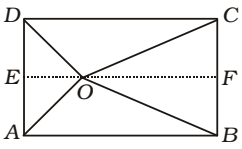
39. (1) Let the marked price of article be Rs. x.
∴ $x \times (100 - 25)\%$
= 120% of 460

$$\Rightarrow x \times \frac{75}{100} = \frac{460 \times 120}{100}$$

$$\Rightarrow x = \frac{460 \times 120}{75}$$

= Rs. 736

40. (4) Draw EF || AB
In right angled Δ EOA and Δ OCF
$OA^2 = OE^2 + AE^2$ and OC^2
$= OF^2 + CF^2$
∴ $OA^2 + OC^2 = OE^2 + AE^2 + OF^2 + CF^2$
……(i)
In right angled Δ DEO and Δ OBF



$OD^2 = OE^2 + DE^2$,
$OB^2 = OF^2 + BF^2$
$\Rightarrow OD^2 + OB^2 = OE^2 + OF^2 + DE^2 + BF^2$ ……(ii)
As FB = EA and DE = CF
Here from (i) and (ii)
$OA^2 + OC^2 = OD^2 + OB^2$

41. (1) Given,
$ax = b$
Multiply by y in both side powers,
$\Rightarrow (ax)y = by$
$\Rightarrow axy = c$
Multiply by z in both side powers,

$$\Rightarrow \left(a^{xy}\right)^z = c^z$$

$\Rightarrow axyz = cz$
$\Rightarrow a^1 = cz$
$\Rightarrow cz = a$

42. (1) $a = \dfrac{\sqrt{3}-\sqrt{2}}{\sqrt{3}+\sqrt{2}} \times \dfrac{\sqrt{3}-\sqrt{2}}{\sqrt{3}-\sqrt{2}}$

$$a = \left(\frac{\sqrt{3}-\sqrt{2}}{3-2}\right)^2$$

$$\left[\because (a-b)(a+b) = a^2 - b^2\right]$$

$a = 3 + 2 - 2\sqrt{6}$

$$\boxed{a = 5 - 2\sqrt{6}}$$

$$b = \frac{\left(\sqrt{3}+\sqrt{2}\right)}{\sqrt{3}-\sqrt{2}} \times \frac{\left(\sqrt{3}+\sqrt{2}\right)}{\sqrt{3}+\sqrt{2}}$$

$$b = \frac{\left(\sqrt{3}+\sqrt{2}\right)^2}{3-2}$$

$b = 3 + 2 + 2\sqrt{6}$

$$\boxed{b = 5 + 2\sqrt{6}}$$

$a^2 + b^2 - 5ab$

$$= \left(5 - 2\sqrt{6}\right)^2 + \left(5 + 2\sqrt{6}\right)^2 - 5$$

$$\left(\frac{\sqrt{3}-\sqrt{2}}{\sqrt{3}+\sqrt{2}}\right)\left(\frac{\sqrt{3}+\sqrt{2}}{\sqrt{3}-\sqrt{2}}\right)$$

$$= 5^2 + \left(2\sqrt{6}\right)^2 - 20\sqrt{6} + 5^2 +$$

$$\left(2\sqrt{6}\right)^2 + 20\sqrt{6} - 5$$

= 25 + 24 + 25 + 24 – 5
= 98 – 5 = 93

43. (4) Here, $a + b + c = 9$
Squaring both side,
$(a + b + c)^2 = 9^2$
$a^2 + b^2 + c^2 + 2ab + 2bc + 2ac = 81$
$\Rightarrow a^2 + b^2 + c^2 + 2(ab + bc + ca) = 81$
Here, $ab + bc + ca = 40$
$a^2 + b^2 + c^2 + 80 = 81$
$\Rightarrow a^2 + b^2 + c^2 = 81 - 80 = 1$

44. (4) Given

$$\frac{\text{Monthly income of A}}{\text{Monthly income of B}} = \frac{5}{6}$$

∴ Monthly income of A
= 5x
and that of B = 6x (x is a constant)
According to the question

$$\frac{5x - 1800}{6x - 1600} = \frac{3}{4}$$

20x – 7200 = 18x – 4800
2x = 2400
∴ x = 1200
∴ Monthly income of B
= 1200 × 6 = Rs. 7200

45. (3) $3x + 5(4 - 3x) > 2 - 4x$
$\Rightarrow 3x + 20 - 15x > 2 - 4x$
$\Rightarrow 20 - 12x > 2 - 4x$
$\Rightarrow 20 - 2 > 12x - 4x$
$\Rightarrow 18 > 8x$

$$\Rightarrow x < \frac{18}{8} \Rightarrow x < \frac{9}{4}$$

Again,

$$2 - 4x < 3x - \frac{x}{3}$$

$\Rightarrow 6 - 12x < 9x - x$
$\Rightarrow 6 - 12x < 8x$
$\Rightarrow 6 < 12x + 8x$
$\Rightarrow 6 < 20x$

$$\Rightarrow x > \frac{6}{20} \Rightarrow x > \frac{3}{10}$$

$$\therefore \frac{3}{10} < x < \frac{9}{4}$$

46. (1) $\sqrt[3]{4}, \sqrt{2}, \sqrt[6]{3}, \sqrt[4]{5}$
L.C.M. of 3, 2, 6, 4, = 12

$$\sqrt[3]{4} = (4)^{\frac{1}{3}} = (4)^{\frac{4}{12}}$$

$$= \left(4^4\right)^{\frac{1}{12}} = (256)^{\frac{1}{12}}$$

$$\sqrt{2} = (2)^{\frac{1}{2}} = (2)^{\frac{6}{12}}$$

$$= \left(2^6\right)^{\frac{1}{12}} = (64)^{\frac{1}{12}}$$

$$\sqrt[6]{3} = (3)^{\frac{1}{6}} = (3)^{\frac{2}{12}} = \left(3^2\right)^{\frac{1}{12}}$$

$$= (9)^{\frac{1}{12}}$$

$$\sqrt[4]{5} = (5)^{\frac{1}{4}} = (5)^{\frac{3}{12}} = \left(5^3\right)^{\frac{1}{12}}$$

$$= (125)^{\frac{1}{12}}$$

$$\therefore (256)^{\frac{1}{12}} > (125)^{\frac{1}{12}} > (64)^{\frac{1}{12}} > (9)^{\frac{1}{12}}$$

or, $\sqrt[3]{4} > \sqrt[4]{5} > \sqrt{2} > \sqrt[6]{3}$

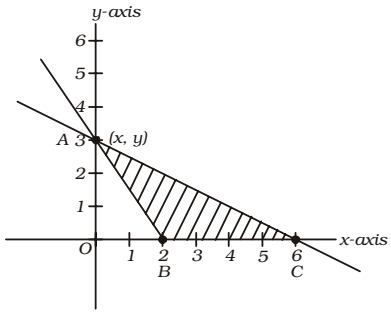
47. (1) $2x + 4y = 12$

$$\frac{x}{6} + \frac{y}{3} = 1 \quad \text{...(i)}$$

$3x + 2y = 6$

$\frac{x}{2} + \frac{y}{3} = 1$ ...(ii)

$y = 0$ ...(iii)



From (i) and (ii) equation we find

$x = 0, y = 3$

BC = 6 – 2 = 4

$\therefore$ Area of $\Delta ABC = \frac{1}{2} \times 4 \times 3$

= 6 sq. unit

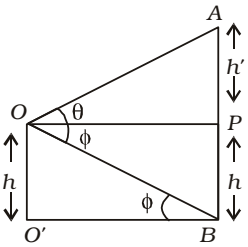
48. (4) Let O be the window and AB be the house on the opposite side of the street.

Then, OP is the width of the street.

Let AP = h', BP = 00' = h

In right angled Δ AOP

$$\frac{h'}{OP} = \tan\theta$$



and in right angled ΔBOP,

$$\frac{h}{OP} = \tan\phi$$

$$\therefore \frac{h'}{h} = \frac{\tan\theta}{\tan\phi}$$

$\Rightarrow$ h' = h tan θ cot ϕ

$\therefore$ Height of the house

AB = AP + PB = h tan θ cot ϕ + h

= h [tan θ cot ϕ +1]

49. (2) $\sqrt{2+\sqrt{2+\sqrt{2+2\cos 8\theta}}}$

$= \sqrt{2+\sqrt{2+\sqrt{2(1+\cos 8\theta)}}}$

$= \sqrt{2+\sqrt{2+\sqrt{(2\ .\ 2\cos^2 4\theta)}}}$

$[\because 1+\cos 2\theta = 2\cos^2\theta]$

$= \sqrt{2+\sqrt{2+2\cos 4\theta)}}$

$= \sqrt{2+\sqrt{2(1+\cos 4\theta)}}$

$= \sqrt{2+\sqrt{2\ .\ 2\cos^2 2\theta)}}$

$= \sqrt{2+2\cos 2\theta}$

$= \sqrt{2(1+\cos 2\theta)}$

$= \sqrt{2\ .\ 2\cos^2\theta}$

= 2 cos θ

Aliter :

Put $\theta = 0$

$= \sqrt{2+\sqrt{2+\sqrt{2+2+\cos 8\theta}}}$

$= \sqrt{2+\sqrt{2+\sqrt{2+2+\cos 0°}}}$

$= \sqrt{2+\sqrt{2+2}} = \sqrt{2+2} = 2$

विकल्पों की सहायता से, विकल्प (2) से

$\Rightarrow$ 2 cos 0° = 2 cos 0° = 2

50. (1) Here, $2\cos\theta = x + \frac{1}{x}$

we know that,

$\cos 3\theta = 4\cos^3\theta - 3\cos\theta$

$\Rightarrow 2\cos 3\theta = 8\cos^3\theta - 6\cos\theta$

$= (2\cos\theta)^3 - 3(2\cos\theta)$

$= \left(x+\frac{1}{x}\right)^3 - 3\left(x+\frac{1}{x}\right)$

$= x^3 + \frac{1}{x^3} + 3\left(x+\frac{1}{x}\right) -$

$3\left(x+\frac{1}{x}\right) = x^3 + \frac{1}{x^3}$

51. (3) Here,

$\cos\theta + \cos(120° + \theta) + \cos(\theta - 120°) = 0$

$\Rightarrow$ Let $\cos\theta = a$, $\cos(120° + \theta) = b$, $\cos(\theta - 120°) = c$

$\Rightarrow a + b + c = 0$

$\Rightarrow a^3 + b^3 + c^3 = 3abc$

$\Rightarrow \cos^3\theta + \cos^3(120° + \theta) + \cos^3(\theta - 120°)$

$= 3.\cos\theta.\cos(120° + \theta).\cos(\theta - 120°)$

$= \frac{3}{2}\cos\theta[2\ .\ \cos(120° + \theta)\cos(\theta - 120°)]$

$= \frac{3}{2}\cos\theta[\cos(120° + \theta + \theta - 120°) + \cos(120° + \theta - \theta + 120°)]$

$\because$ 2 cos A cos B = cos (A + B) + cos (A – B)

$= \frac{3}{2}\cos\theta[\cos 2\theta + \cos 240°]$

$= \frac{3}{2}\cos\theta[\cos 2\theta + \cos(180° + 60°)]$

$= \frac{3}{2}\cos\theta[\cos 2\theta - \cos 60°]$

$[\because \cos(180° + \theta) = -\cos\theta]$

$= \frac{3}{2}\cos\theta\left[2\cos^2\theta - 1 - \frac{1}{2}\right]$

$= \frac{3}{2}\cos\theta\left[\frac{4\cos^2\theta - 3}{2}\right]$

$= \frac{3}{4}\cos\theta[4\cos^2\theta - 3]$

$= \frac{3}{4}[4\cos^3\theta - 3\cos\theta]$

$= \frac{3}{4}\cos 3\theta$

Aliter :

Let $\theta = 120°$

$\cos 120° + \cos(120° + 120°)\cos(120° - 120°) = 0$

$-\frac{1}{2} - \frac{1}{2} + 1 = 0$

$\boxed{0 = 0}$

$\therefore \cos^3\theta + \cos^3(120° + \theta) + \cos^3(\theta - 120°)$

$= \cos^3 120° + \cos^3(120° + 120°) + \cos^3(120° - 120°)$

$= \left(-\frac{1}{2}\right)^3 + \left(-\frac{1}{2}\right)^3 + 1 = \frac{3}{4}$

From option

$\frac{3}{4}\cos 3\theta = \frac{3}{4}\cos 3 \times 120°$

$= \frac{3}{4}\cos 360°$

(∵ cos 360° = cos (270 + 90°) = sin 90° = 1)

$= \frac{3}{4}$

52. (3) S.I.

$= \frac{Principal \times Time \times Rate}{100}$

$= \frac{100000 \times 6 \times 6}{100}$

= Rs. 36000

Total pocket money

= 6 × 2500 = Rs. 15000

Total expenses of trust

= 6 × 500 = Rs. 3000

Total expenses

= Rs. (15000 + 3000)

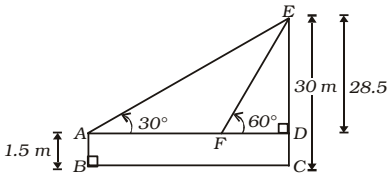
= Rs. 18000

∴ Amount to be received by the boy

= Rs. (100000 + 36000 – 18000)

= Rs. 118000

53. (3)



From ΔADE,

30° : 60° : 90°

1 : √3 : 2

ED : AD : AE

$AD = ED\sqrt{3}$

$\boxed{AD = 28.5\sqrt{3}\ m}$

From ΔDEF,

30° : 60° : 90°

1 : √3 : 2

FD : ED : EF

$ED = \sqrt{3}\ FD$

$FD = \frac{ED}{\sqrt{3}} = \frac{28.5}{\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}}$

$FD = 9.5\sqrt{3}$

Distance covered

$= 28.5\sqrt{3} - 9.5\sqrt{3} = 19\sqrt{3}\ m$

Aliter :

$d = h(\cot\theta_1 - \cot\theta_2)$

$= 28.5(\cot 30° - \cot 60°)$

$= 28.5\left(\sqrt{3} - \frac{1}{\sqrt{3}}\right)$

$= \frac{28.5 \times 2}{\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}}$

$\boxed{d = 19\sqrt{3}\ m}$

54. (1) Here, ∠2 = ∠1 तथा ∠3 = ∠4

Adding both sides,

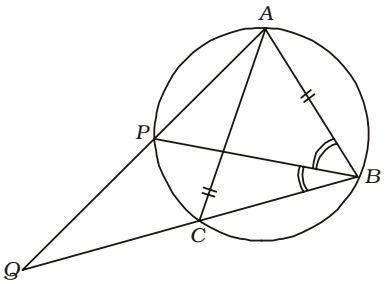
∠2 + ∠3 = ∠1 + ∠4

Add 30° both sides,

∠2 + ∠3 + 30° = ∠1 + ∠4 + 30°

⇒ θ = 30°

55. (1) In ΔAQC, we have



∠ACB = ∠AQC + ∠QAC

(∵ किसी triangle में exterior angle सामने के interor angle के sum के बराबर होता है।)

⇒ ∠ABC = ∠AQC + ∠QAC

[∵ AB = AC

∴ ∠ACB = ∠ABC]

2∠PBC = ∠AQC + ∠PBC

⇒ ∠PBC = ∠AQC

[∵ ∠PBC = ∠PAC (angles in the same segment)]

⇒ ∠PAC = ∠AQC

⇒ ∠QAC = ∠AQC

⇒ CQ = CA

56. (2) Let the original price of rice be Rs. x per kg.

New price = Rs. (x – 20% of x)

= Rs. (x – 0.20x) = Rs. 0.80 x

Saving on Rs. 100

= 20% of 100 = Rs. 20

New price of 2 kg. rice

= 2 × 0.80 = Rs. 1.6 x

These additional 2 kg of rice bought out of saving due to reduction in price of the rice,

So, 1.6x = 20

$\therefore x = \frac{20}{1.6} = \frac{200}{16}$ = Rs. 12.5

Old price of rice per kg

= Rs. 12.5

New price of rice per kg

= 12.5 × 0.80 = Rs. 10

Aliter :

When the expense on a commodity is constant. There will be inverse relation in price and quantity of the commodity.

$Price\ \alpha \frac{1}{Quantity}$

	Case I	Case II
Price	100	80 (∵ 20% decrease)
Quantity	5	4

5 : 80

5

+ 1 unit = 2 kg

5 unit = 10 kg for Rs. 100

Rs/kg = $\frac{100}{10}$ = Rs. 10/kg

57. (3) C.P. of an article = $Rs.\frac{10}{11}$

S.P. of an article = $Rs.\frac{11}{10}$

$\therefore$ Profit = $\frac{11}{10} - \frac{10}{11}$

$= \frac{121-100}{110} = Rs.\frac{21}{110}$

$\therefore$ Profit % = $\frac{\frac{21}{110} \times 100}{\frac{10}{11}}$

$= \frac{2100}{110} \times \frac{11}{10} = 21\%$

Aliter :

Let no. articles = 110

(∵ LCM of 10 & 11 ⇒ 110)

CP of 110 articles = $\frac{110}{11} \times 110$

= Rs. 100

SP of 110 articles = $\frac{110}{11} \times 110$

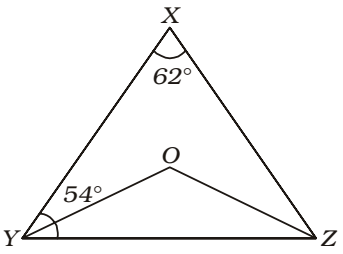
= Rs. 121

Profit % = $\frac{Profit}{CP} \times 100$

$= \frac{SP - CP}{CP} \times 100$

$= \frac{121-100}{100} \times 100 = 21\%$

58. (2) Here, ∠X = 62° and ∠XYZ = 54°



In ΔXYZ,
$\angle XYZ + \angle YXZ + \angle XZY$
$\Rightarrow 54° + 62° + \angle XZY = 180°$
$\Rightarrow \angle XZY = 180° - 116°$
$\angle XZY = 64°$
OY and OZ, $\angle XYZ$ and $\angle XZY$ angle are bisector.

$$\Rightarrow \angle OZY = \frac{1}{2} \times 64° = 32°$$

We know,

$$\angle YOZ = 90° + \frac{1}{2}\angle YXZ$$

$$= 90° + \frac{1}{2} \times 62°$$

$$= 90° + 31°$$

$\angle YOZ = 121°$
$\Rightarrow \angle OZY = 32°$ & $\angle YOZ = 121°$

59. (1) Let the cost price of the article = Rs. x
S.P. at 10% loss

$$= x \times \frac{90}{100} = Rs.\ 9x$$

S.P. at $12\frac{1}{2}\%$ gain

$$= x \times \frac{100 + 12\frac{1}{2}}{100} = Rs.\ \frac{225x}{200}$$

According to the question

$$9x + 9 = \frac{225x}{200}$$

$\Rightarrow 180x + 1800 = 225x$
$\Rightarrow 225x - 180x = 1800$
$\Rightarrow 45x = 1800$
$\therefore x = Rs.\ 40$
Aliter :
SP at 10% loss = 90% of CP...(i)
SP at 12.5% profit
= 112.5% of CP ...(ii)
As per question (ii)–(i)
(112.5% – 90%) of CP = Rs 9

$$CP = \frac{9}{22.5} \times 100 = Rs\ 40$$

60. (4) S.P. of that article

$$= 800 \times \frac{90}{100} = Rs.\ 720$$

He still makes 20% profit
$\therefore$ C.P. of that article

$$= 720 \times \frac{100}{120} = Rs.\ 600$$

Aliter :
As per question
SP = 90% of MP = 120% of CP

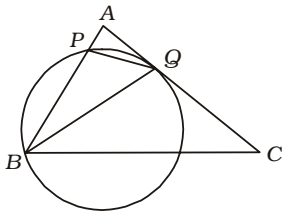
$$\frac{MP}{CP} = \frac{120}{90} = \frac{4}{3}$$

$\because$ MP = 800 (Given)

$$\Rightarrow CP = \frac{3}{4} \times MP$$

$$= \frac{3}{4} \times 800 = Rs.\ 600$$

61. (4)



AB = AC = 2x
AQ = QC = x
AB is a secant.
$\Rightarrow AP \times AB = AQ^2$
$\Rightarrow AP \times 2x = x^2$

$$\Rightarrow AP = \frac{x}{2}$$

$$\therefore \frac{AP}{AB} = \frac{x}{2 \times 2x} = \frac{1}{4}$$

62. (2) Price after 10% first discount

$$= 1000 \times \frac{100 - 10}{100}$$

$$= 1000 \times \frac{90}{100} = Rs.\ 900$$

Given :
Price after second discount
= Rs. 810
$\therefore$ Second discount
= 900 – 810 = Rs. 90
$\therefore$ Percentage second discount

$$= \frac{90 \times 100}{900} = 10\%$$

Aliter :
Let two successive discounts are D_1 & D_2.

$$SP = MP \times \frac{(100 - D_1)}{100} \times \frac{(100 - D_2)}{100}$$

$$810 = 1000 \times \frac{(100 - 10)}{100} \times \left(\frac{100 - D_2}{100}\right)$$

$(100 - D_2) = 90$
$D_2 = 10\%$

63. (2) Let the speed of boat in still water be x kmph and the distance be y km.
$\therefore$ Rate downstream
= $(x + 1.5)$ kmph
Rate upstream
= $(x - 1.5)$ kmph
According to the question,

$$\frac{y}{x + 1.5} = 3 \quad \text{--- (i)}$$

$$\frac{y}{x - 1.5} = \frac{7}{2} \quad \text{--- (ii)}$$

On dividing equation (i) by (ii),

$$\frac{x - 1.5}{x + 1.5} = \frac{3 \times 2}{7} = \frac{6}{7}$$

$\Rightarrow 7x - 10.5 = 6x + 9$
$\Rightarrow x = 10.5 + 9 = 19.5$ kmph.
Aliter :
Let Speed of Boat in still waater = x km/hr
Speed of current = y km/hr
$\therefore$ Speed of Boat (Upstream)
= $(x - y)$ km/hr
$\therefore$ Speed of Boat (downstream)
= $(x + y)$ km/hr
Speed (downstream – upstream) = $2y$ km/hr
in given question y = 1.5 k/hr
$\therefore \Delta$ Speed (Downstream – upstream = 3 km/hr
For same distance covered.
Three will be in herse relation in time & speed

$$\boxed{Time\ \alpha\ \frac{1}{Speed}}$$

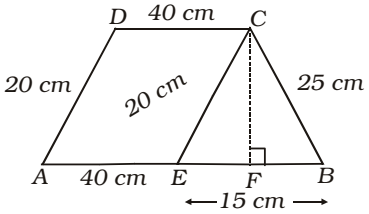
	Down steam	Up steam	
Time	3	3.5	$\because$
	6	:	7
Quantity	7	:	6

1 unit = 3 km/hr

7 unit = 21 km/hr
$\therefore x + y = 21$ km/hr
$x = 21 - y = 21 - 1.5$ km/hr
= 19.5 km/hr

64. (2) Given ABCD trapezium

$\Rightarrow$ AB = 55 cm
CD = 40 cm
AD = 20 cm
BC = 25 cm
CE || DA and 11^{gm} AECD



$\Rightarrow$ CE = 20 cm and AE = 40 cm
Also, BE = AB – AE
BE = 55 – 40 = 15 cm
CF $\perp$ AB and CF = h cm
In ΔEBC,
a = 20 cm, b = 25 cm and c = 15 cm

$\Rightarrow S = \frac{a+b+c}{2}$

$= \frac{20+25+15}{2} = \frac{60}{2} = 30$ cm

Area of ΔEBC

$= \sqrt{S(S-a)(S-b)(S-c)}$

$= \sqrt{30(30-20)(30-25)(30-15)}$

$= \sqrt{30\times10\times5\times15}$
$= 10 \times 3 \times 5 = 150$ cm^2
Also area of ΔEBC,

$= \frac{1}{2} \times b \times h$

$150 = \frac{1}{2} \times 15 \times h$

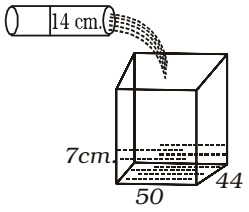
h = 20 cm
Area of Trapezium ABCD,

$= \frac{1}{2}$ × (sum of parallel sides) × Height

$= \frac{1}{2} \times (40 + 55) \times 20$

$= 95 \times 10$
$= 950$ cm^2

65. (2) Let the water level of the tank will rise by x cm.
Speed of flow = 5 km/hr
Length of flow
= 5x km
= 5000x m in x hrs.



Cylindrical pipe का diameter = 14 cm.

$\Rightarrow$ Radius, r = $\frac{14}{2}$ = 7 cm.

$= \frac{7}{100}$ m

Volume of water flowing through pipe in x h

$\Rightarrow \pi r^2 h = \frac{22}{7} \times \left(\frac{7}{100}\right)^2 \times 5000x$

$= 77\,x$ m^3
Volume of water = p × b × h

$= 50 \times 44 \times \frac{7}{100} = 154$ m^3

$\Rightarrow 77\,x = 154$
$x = 2$
$\Rightarrow$ water rises by 7 cm. in 2h.

66. (3) Let the length of the train = x m
$\therefore$ Speed of the train

$= \frac{x+800}{100}$ m/s

Since train passes the 800 m bridge in 100 seconds.
Again train passes the 400 m bridge in 60 seconds.

$\therefore \frac{400+x}{\frac{x+800}{100}} = 60$

$\Rightarrow \frac{(400+x)\times100}{x+800} = 60$

$\Rightarrow$ 40000 + 100x
= 60x + 48000
$\Rightarrow$ 100x – 60x
= 48000 – 40000
$\Rightarrow$ 40x = 8000

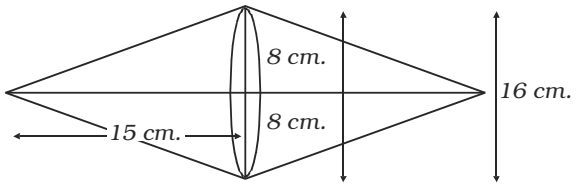
$\therefore x = \frac{8000}{40} = 200m$

Aliter :
$\because$ 100 – 60 = 40 Second in covered distance
= (800 – 400) = 400 m
$\therefore$ 60 second in covered distance

$= \frac{400}{40} \times 60 = 600$ m

(i.e. train + 400 m bridge)
train length + 400 m bridge
= 600 m
train length= 600 + 400 = 200m

67. (3) Join the cones, we can get this type of figure,



r = 8 cm.
h = 15 cm.
S.A. of shape = C.S.A of Ist cone + C.S.A. of 2nd Cone
= 2 × πrl

$= 2 \times \frac{22}{7} \times r \times \sqrt{r^2+h^2}$

$= 2 \times \frac{22}{7} \times 8 \times \sqrt{8^2+15^2}$

$= \frac{44\times8\times\sqrt{289}}{7} = \frac{44\times8\times17}{7}$

$= \frac{5984}{7} = 854.85$ cm.^{2}

$\approx$ 855 cm.^{2}

68. (1) Let the divisor be x
According to the question

Quotient will be $= \frac{x}{25}$

Remainder $= \frac{x}{5}$

Given, quotient = 16

So, $\frac{x}{25} = 16$

$\therefore$ x = 25 × 16 ....(I)

Dividend = Divisor × Quotient + Remainder

$= x \times \frac{x}{25} + \frac{x}{5} \quad = \frac{x}{5}\left(\frac{x}{5} + 1\right)$

$= \frac{16 \times 25}{5}\left(\frac{25 \times 16}{5} + 1\right)$

[Putting the value of x]

$= \frac{16 \times 25 \times 405}{25} = 6480$

Quicker Approach

Divisor = 25 × 16 = 400

Remainder = $\frac{400}{5} = 80$

$\therefore$ Dividend

= 400 × 16 + 80 = 6480

69. (1) LCM of 18, 21 and 24

2	18, 21, 24
3	9, 21, 12
	3, 7, 4

LCM = 2 × 3 × 3 × 7 × 4 = 504

Now compare the divisors with their respective remainders. We observe that in all the asses the remainder is just 11 less than their respecitve divisor. So the number can be given by 504 K – 11. Where K is an positive integer

Since 23 × 21 = 483

We can write = 504 K – 11

= (483 + 21) K – 11

= 483 K + (21K – 11)

483 K is multiple of 23, since 483 is divisible by 23.

So, for (504K – 11) to be multiple of 23, the remainder (21K – 11) must be divisible by 23.

Put the value of K = 1, 2, 3, 4, 5, 6, ... and so on successively. We find that the minimum value of K for which (21K – 11) is divisible by 23. is 6, (21 × 6 – 11)

= 115 which is divisible by 23.

Therefore, the required least number

= 504 × 6 – 11 = 3013

70. (1) $x(x + y + z) = 20$

$\Rightarrow x^2 + xy + xz = 20$ --- (i)

Again, $y(x + y + z) = 30$

$\Rightarrow xy + y^2 + yz = 30$ --- (ii)

and, $z(x + y + z) = 50$

$\Rightarrow xz + yz + z^2 = 50$ --- (iii)

On adding all three equations,

$x^2 + y^2 + z^2 + 2xy + 2yz + 2zx =$ 20 + 30 + 50

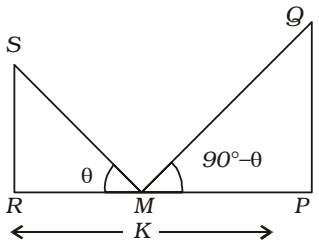
$\Rightarrow (x + y + z)^2 = 100$

$\Rightarrow x + y + z = 10$

$\Rightarrow 2(x + y + z) = 20$

71. (2) Let PQ and RS be the two posts, such that PQ = 2RS.

If M is the mid point of RP



RM = PM = $\frac{k}{2}$

$\because \angle RMS = \theta$

and $\angle QMP = 90° - \theta$

Let RS = h, then PQ = $2h$

Now, in Δ PMQ,

$\tan(90° - \theta) = \frac{PQ}{MP}$

$\frac{PQ}{MP} = \cot\theta \Rightarrow \frac{2h}{k/2} = \cot\theta$

or $\cot\theta = \frac{4h}{k}$ ..... (i)

In Δ SRM,

$\tan\theta = \frac{SR}{RM}$

$\Rightarrow \frac{h}{k/2} = \tan\theta$

$\Rightarrow \frac{2h}{k} = \tan\theta$ ..... (ii)

Multiplying Eq. (i) by Eq. (ii), we get

$\frac{4h}{k} \times \frac{2h}{k} = 1 \Rightarrow 8h^2 = k^2$

$\Rightarrow h^2 = \frac{k^2}{8}$

$\Rightarrow h = \frac{k}{2\sqrt{2}}m$

72. (4) The greatest number of five digits is 99999.

LCM of 3, 5, 8 and 12

2	3, 5, 8, 12
2	3, 5, 4, 6
3	3, 5, 2, 3
	1, 5, 2, 1

$\therefore$ LCM = 2 × 2 × 3 × 5 × 2 = 120

After dividing 99999 by 120, we get 39 as remainder

99999 – 39 = 99960

= (833 × 120)

99960 is the greatest five digit number divisible by the given divisors.

In order to get 2 as remainder in each case we will simply add 2 to 99960.

$\therefore$ Greatest number

= 99960 + 2 = 99962

73. (1) Area of $\Delta AOB = \frac{1}{2} \times OA \times$ AB [$\because$ OA = AB]

$= \frac{1}{2} \times 2 \times 2 = 2$ cm^2

Area of sector $= \frac{\pi r^2\theta}{360°}$ [$\theta = 45°$]

$= \frac{\pi \times (2)^2 \times 45°}{360°} = \frac{\pi}{2}$ cm^2

Shaded area $= \left(2 - \frac{\pi}{2}\right)$cm^2

74. (3) Let AB = x, then AM = $\frac{x}{2}$

and, AC = CM = MD = BD = $\frac{x}{4}$

Now, OC = OP + PC = OP + CM

$= \left(r + \frac{x}{4}\right)$

and, OD = OQ + QD = OQ + MD

$= \left(r + \frac{x}{4}\right)$ [$\because$ OC = OD]

$\therefore$ OCD is an isosceles triangle.

As M is the mid-point of CD,

So $\angle OMC = 90°$

In right angled ΔOMC

$OC^2 = OM^2 + CM^2$

$\because$ OM = RM – OR = $\left(\frac{x}{2}-r\right)$

$\therefore \left(r+\frac{x}{4}\right)^2=\left(\frac{x}{2}-r\right)^2+\left(\frac{x}{4}\right)^2$

$\Rightarrow r=\frac{1}{6}x=\frac{1}{6}AB$

75. (3) According to the question
5 men = 8 women

$\therefore$ 2 men $=\frac{8}{5}\times 2=\frac{16}{5}$ women

$\therefore$ Total women $=\frac{16}{5}+4$

$=\frac{36}{5}$ women

$\therefore$ No. of days to do the same work $=\frac{8\times 12}{\frac{36}{5}}=\frac{8\times 12\times 5}{36}$

$=\frac{40}{3}=13\frac{1}{3}$ days

76. (1) Mean proportional of 10.8 and 4.8

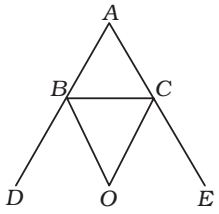
$=\sqrt{10.8\times 4.8}=7.2$

Third proportional of 2 and 4

$=\frac{4\times 4}{2}=8$

$\therefore$ Required sum
= 7.2 + 8 = 15.2

77. (2)



$\angle BAC = 50°$

$\therefore \angle BOC = 90° - \frac{A}{2}$

$= 90° - \frac{50°}{2} = 65°$

78. (1) Weight of zinc

$=200\times\frac{5}{8}=125$ gram

Weight of copper

$=200\times\frac{3}{8}=75$ gram.

Let the ratio of 125 gram zinc and x gram copper be 3 : 5

$\therefore \frac{125}{x}=\frac{3}{5}$

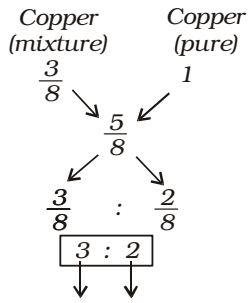
$\therefore x=\frac{125\times 5}{3}=\frac{625}{3}$ gram

$\therefore$ Addition of copper in mixture

$=\frac{625}{3}-75=\frac{625-225}{3}$

$=\frac{400}{3}=133\frac{1}{3}$ gram.

Aliter :
Applying Alligation concept



200 gm $\therefore \frac{200}{3}\times 2=133\frac{1}{3}$ gm

79. (4) According to question
Price of 4 tables
= price of 10 chairs.
$\therefore$ Price of 2 tables = price of 5 chairs, price of 3 tables

$=\frac{10}{4}\times 3$

= price of $\frac{30}{4}=\frac{15}{2}$ chairs

Again,
Price of 15 chairs and 2 tables = Rs. 4000
or, price of 15 chairs + 5 chairs = Rs. 4000
or, price of 20 chairs = Rs. 4000
$\therefore$ Price of 1 chair

$=\frac{4000}{20}=Rs.\ 200$

$\therefore$ Price of 12 chairs and 3 tables
= price of 12 chairs + price $\frac{15}{2}$ chairs

= price of $\left(12+\frac{15}{2}\right)=\frac{39}{2}$ chairs

$=\frac{39}{2}\times 200=$ Rs. 3900

Aliter :
CP of 10 chairs
= CP of 4 tables

$\boxed{\frac{CP\ chair}{CP\ table}=\frac{2}{5}}\Rightarrow\frac{2x}{5x}$

15 chairs + 2 tables = Rs. 4000
$(15\times 2x)+2\times 5x=4000$
$\Rightarrow 40x=4000$

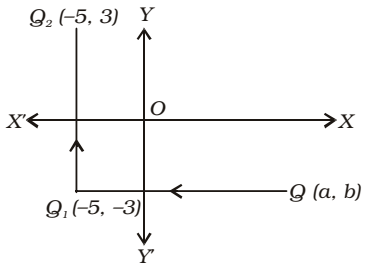
$\Rightarrow \boxed{x=Rs.\ 100}$

As per question
$\Rightarrow$ 12 chairs + 3 tables
$=(12\times 2x)+(3\times 5x)$
$=39x=$ Rs. 3900

80. (1) $\therefore$ Here, S.Ps are same
$\therefore$ There will be loss
Loss per cent

$=\left(\frac{23\times 23}{100}\right)\%=5.29\%$

81. (4)



Clearly, Q (a, b) is in fourth quadrant.
$\therefore$ Co-ordinates of Q = (5, –3)

82. (1) $\angle BPY = \angle BAP$
(angels in alternate segments)
$\angle DPY = \angle DCP$
(angels in alternate segments)
$\therefore \angle DPY - \angle BPY = \angle DCP - \angle BAP$
$\Rightarrow \angle DPB = \angle CPA$

83. (4) $1\frac{1}{2}$ hours = 90 minutes

1 hour and 45 minutes
= 105 minutes
1 hour = 60 minutes
∴ LCM of 30 minutes, 60 minutes, 90 minutes and 105 minutes

3	30,	60,	90,	105
5	10,	20,	30,	35
2	2,	4,	6,	7
	1,	2,	3,	7

∴ LCM = 3 × 5 × 2 × 2 × 3 × 7
= 1260 minutes

1260 minutes $= \frac{1260}{60} = 21$ hours

∴ The bell will again ring simultaneously after 21 hours.
∴ Time will be
= 12 noon + 21 hours = 9 a.m.

84. (2) Let the fraction = x
According to the question ;

$$\Rightarrow \frac{7x}{6} - \frac{6x}{7} = \frac{13}{70}$$

$$\Rightarrow \frac{49x - 36x}{42} = \frac{13}{70} \Rightarrow \frac{13x}{42} = \frac{13}{70}$$

$$\therefore x = \frac{13 \times 42}{70 \times 13} = \frac{3}{5}$$

85. (1) Here, $2m + 2m^{+1} = 96$

$\Rightarrow 2m + 2m \times 2 = 96$

$2m(1 + 2) = 96$

$\Rightarrow 2m = \frac{96}{3}$

$2m = 32$

$\Rightarrow 2m = 2^5$

$m = 5$

Here, 2 and 3 is small prime number of 5.
∴ Their sum = 2 + 3 = 5
∴ required pairs = (2, 3) or (3,2)

86. (4) Single equivalent discount for 15% and 10%.

$$= \left(15 + 10 - \frac{15 \times 10}{100}\right)\%$$

= (25 – 1.5)% = 23.5%
∴ Required S.P.
= (100 – 23.5)% of 300

$$= \frac{300 \times 76.5}{100} = \text{Rs. } 229.5$$

Aliter :

When successive discounts are D_1 & D_2

SP = MP

$$\times\left(\frac{100 - D_1}{100}\right) \times \left(\frac{100 - D_2}{100}\right)$$

$$SP = 300 \times \frac{85}{100} \times \frac{90}{100}$$

= Rs. 229.5

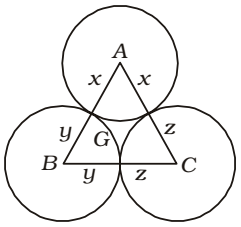
87. (1) $\sqrt{2a^2 + 2\sqrt{6}\,ab + 3b^2}$

$$= \sqrt{\left(\sqrt{2}a\right)^2 + \left(\sqrt{3}b\right)^2 + 2.\sqrt{2}a\sqrt{3}b}$$

$$= \sqrt{\left(\sqrt{2}a + \sqrt{3}b\right)^2}$$

$$= \sqrt{2}a + \sqrt{3}b$$

88. (1)



Let AB = 9 cm, BC = 7 cm
AC = 6 cm
Let, *x*, *y*, *z* be radii of cirlces with centre, A, B, C.
Then, $x + y = 9$, $y + z = 7$ and $z + x = 6$
∴ $2(x + y + z) = 22$
or $(x + y + z) = 11$
∴ $z = 11 - 9 = 2$ cm
$x = 11 - 7 = 4$ cm
$y = 11 - 6 = 5$ cm
So
radii are 4 cm, 5 cm, and 2 cm.

89. (3) According to the question
Cistern can be filled in 1 hour

$= \frac{1}{5}$ part

Cistern can be emptied in 1 hour $= \frac{1}{4}$ part

When the both pipes are opened, simultaneously;
Cistern can be emptied in 1 hour

$$= \frac{1}{4} - \frac{1}{5}$$

$$= \frac{5 - 4}{20} = \frac{1}{20} \text{ part}$$

∴ The time in which it will be emptied = 20 hours.

90. (2) According to the question
Work done by A and B together in one day $= \frac{1}{10}$ part

Work done by B and C together in one day $= \frac{1}{15}$ part

Work done by C and A together in one day $= \frac{1}{20}$ part

By adding all the equations

$$A + B = \frac{1}{10} \quad \text{....(i)}$$

$$B + C = \frac{1}{15} \quad \text{...(ii)}$$

$$C + A = \frac{1}{20} \quad \text{....(iii)}$$

$$2(A + B + C) = \frac{1}{10} + \frac{1}{15} + \frac{1}{20}$$

$$2(A + B + C) = \frac{6 + 4 + 3}{60} = \frac{13}{60}$$

$$A + B + C = \frac{13}{120} \quad \text{....(iv)}$$

Putting the value of eqn. (i) in eqn. (iv)

$$\frac{1}{10} + C = \frac{13}{120}$$

$$C = \frac{13}{120} - \frac{1}{10} = \frac{13 - 12}{120} = \frac{1}{120}$$

∴ Work done in 1 day by C is

$\frac{1}{120}$ part

Hence C will finish the whole work in 120 days

Aliter :

Capacity = work/day		day	
6 unit	← A + B →	10	Total work 60 unit (LCM of 10, 15, 20)
4	← A + B →	15	
3	← A + B →	20	
13 unit	← 2 (A + B + C)		

A + B + C = 6.5 units

$\Rightarrow$ C = (A + B + C) – (A + B)
= 6.5 – 6

$\boxed{C = 0.5 \text{ Units / day}}$

$\Rightarrow$ days required for C to complete work alone

$= \frac{60 \text{ units}}{0.5 \text{ unit / day}} = 120$ days

91. (4) Let total profit be Rs. x.

Remaining profit after donations to charity

$= \text{Rs. } \frac{95x}{100}$

$= \text{Rs. } \frac{19x}{20}$

A : B = 3 : 2

Sum of the terms of the ratio = 3 + 2 = 5

$\therefore$ A's share $= \frac{19x}{20} \times \frac{3}{5}$

$\therefore \quad \frac{19 \times 3x}{100} = 8550$

$\Rightarrow x = \frac{8550 \times 100}{19 \times 3} = \text{Rs. } 15000$

92. (3) Let B does the whole work in x days

$\therefore$ Work done by B in 1 day $= \frac{1}{x}$

According to question

A does the $\frac{1}{2}$ work in $\frac{x}{6}$ days

$\therefore$ A does the whole work in

$\frac{2x}{6}$ days $= \frac{x}{3}$ days

$\therefore$ Work done by A in one day $= \frac{3}{x}$

$\therefore$ Work done by A and B together in one day

$= \frac{1}{x} + \frac{3}{x} = \frac{4}{x}$

$\therefore$ Time taken to complete the whole work by A and B together

$= \frac{1}{\frac{4}{x}} = \frac{x}{4}$ days

Again, given that $\frac{x}{4} = 10$

$\therefore$ x = 40 days

Aliter :

	A		B
work	1	:	3
time	1	:	6

Capacity $= \frac{work}{time}$

$\Rightarrow \quad 1 \quad : \quad \frac{2}{6}$

Total work = 10 (A + B)
= 10 (3 + 1) = 40 units
Days required B to complete work alone

$= \frac{\text{total work}}{\text{B's capacity}} = \frac{40}{1} = 40$ days

93. (1) Exterior angle of a regular hexagon $= \frac{360°}{6} = 60°$

$\therefore$ Each of interior angles
= 180° – 60° = 120°

$\therefore$ Each interior angle of the given polygon

$= \frac{9}{8} \times 120° = 135°$

$\therefore$ Each of exterior angle of the given polygon
= 180°– 135° = 45°

$\therefore \frac{360°}{n} = 45°$

$\Rightarrow n = \frac{360°}{45°} = 8$

94. (3) In collinear condition slopes are same.

(a, b) (x, b) (a + x, b + y)

$\therefore \quad \frac{y-b}{x-a} = \frac{b+y-y}{a+x-x}$

$ay - ab = bx - ba$

$ay = bx$

95. (1) $2x - 2(x-2) < 5 - x$

$\Rightarrow 2x - 2x + 4 < 5 - x$

$\Rightarrow 4 < 5 - x$

$\Rightarrow x < 5 - 4 \Rightarrow x < 1$

Again,

$5 - x > -2x + 2$

$\Rightarrow -x + 2x > -5 + 2$

$\Rightarrow x > -3$

$\therefore -3 < x < 1$

96. (1) If A (x_1, y_1), B (x_2, y_2) and C (x_3, y_3) be collinear, then

$x_1 (y_2 - y_3) + x_2 (y_3 - y_1) + x_3 (y_1 - y_2) = 0$

$\therefore 3(4 - x) + 1(x + 2) - 2(-2 - 4) = 0$

$\Rightarrow 12 - 13x + x + 2 + 12 = 0$

$\Rightarrow 2x = 26$

$\Rightarrow x = \frac{26}{2} = 13$

97. (1) $\frac{a}{b} = \frac{25}{6}$

$\Rightarrow \frac{a^2}{b^2} = \frac{25^2}{6^2} = \frac{625}{36}$

By componendo and dividendo,

$\frac{a^2 - b^2}{a^2 + b^2} = \frac{625 - 36}{625 + 36} = \frac{589}{661}$

98. (2) Required number of cycles = 1060 + 920 = 1980

99. (3) Required number of cycles = 1440

100. (1) Required number of cycles = 800 + 1300 + 1060 + 920 + 1440 = 5520

□□□

SET 2

MODEL PRACTICE SET

PAPER–II ♦ Marks : 200 ♦ No. of Questions : 200 ♦ Time : 2 Hrs.

ENGLISH LANGUAGE AND COMPREHENSION

Directions (1-30) : In the following questions, you have three passages. In each of the following passages, some of the words have been left out. First read each passage over and try to understand what is about. Then fill in the blanks with the help of the alternatives given.

PASSAGE-I

I will always **(1)** the trip I made to the zoo in 1988. It was then that I **(2)** measles from one of my friends. Peter, who had **(3)** along too.

Before he met us at the zoo, he had gone to visit his cousin who was **(4)** from measles. The next day, Peter was **(5)** of a sore throat, a bad cold and high fever. When he was diagnosed by a doctor as having measles, his parents rang me up to warn me that I had been **(6)** to measles too. By the next day, I was also showing/having the same symptoms. My doctor **(7)** me to stay at home for the next two weeks.

I was quite pleased with the doctor's instruction. I spent the time reading story-books, **(8)** to music and watching television. When I get bored, I would call up Peter, who also had to spend two weeks at home, for a chat. Unfortunately, the two weeks passed too/by quickly. When we **(9)** to school, we had to work twice as hard to **(10)** with our classmates. It was definitely not worth the 'holiday'.

1. (1) remember
   (2) remembered
   (3) be remember
   (4) remembering
2. (1) catch (2) will catch
   (3) caught (4) catching
3. (1) went (2) gone
   (3) going (4) go
4. (1) recover (2) revealed
   (3) removed (4) recovering
5. (1) complained
   (2) complain
   (3) complaining
   (4) explained
6. (1) exposed (2) exposing
   (3) expose (4) exposable
7. (1) advise (2) advised
   (3) is advised (4) advising
8. (1) listening (2) looking
   (3) listen (4) listened
9. (1) returning (2) is returned
   (3) return (4) returned
10. (1) caught up (2) catching up
    (3) catch up (4) catch

PASSAGE-II

When we visited the volcano it was in a state of **(11)**. We stood near the **(12)** on an irregular plane. It was heaped **(13)** stones and cinders and **(14)** rocks which had been regularly **(15)** out from the volcano.

During the volcanic eruption, large quantities of rocks and stones were hurled out from the summit in terrible **(16)**. From the summit volumes **(17)** smoke and fountains of liquid fire **(18)** forth continuously. The smoke now white, now impenetrably black was **(19)** by a deep fiery roar. Stones **(20)** down and the molten lava moved on with a horrible sound.

11. (1) movement (2) eruption
    (3) ejection (4) insertion
12. (1) point (2) summit
    (3) path (4) curve
13. (1) on (2) in
    (3) with (4) by
14. (1) slanting (2) curving
    (3) pointed (4) big
15. (1) flung (2) toppled
    (3) distanced (4) over-flown
16. (1) calm (2) confusion
    (3) horror (4) speed
17. (1) in (2) about
    (3) of (4) with
18. (1) flew (2) extracted
    (3) poured (4) oozed
19. (1) together (2) turned
    (3) stuck
    (4) accompanied
20. (1) rose (2) ascended
    (3) rained (4) poured

PASSAGE-III

The Earth's temperature is rising **(21)** Scientists say that the rise in the average temperature ranges from 1.8°C to 4°C. This **(22)** in temperature is called global warming or climate change. Although it is a natural phenomenon, human action is the **(23)** cause of global warming The burning of fossil fuels such as petroleum and coal **(24)** a lot of greenhouse gases into the Earth's atmosphere. Carbon dioxide. methane and nitrous oxide are the main greenhouse gases **(25)** for global warming. Besides greenhouse gases, deforestation is **(26)** major cause of this problem. Global warming has led to changes in temperature and rainfall patterns which have severely **(27)** agriculture. No one can **(28)** that this is the most serious environmental challenge that mankind is facing today. While it is not possible to reverse the process, the rate of global warming can be checked if all the countries **(29)** some measures. **(30)** of the measures is the recycling and reusing articles like paper, glass, Aluminum and plastic.

21. (1) strongly (2) steadily
    (3) stability (4) simply
22. (1) high (2) increase
    (3) incline (4) raise
23. (1) major (2) slowest
    (3) rapid (4) mutual
24. (1) realizes (2) releases
    (3) revives (4) leads
25. (1) responsible
    (2) dependent
    (3) account
    (4) available
26. (1) another (2) together
    (3) other (4) further

27. (1) renewed (2) reduced
(3) affected (4) effected

28. (1) deny (2) accept
(3) mean (4) regret

29. (1) check (2) watch
(3) adapt (4) adopt

30. (1) one (2) none
(3) all (4) few

Directions (31-55) : In the following questions, you have five passages with five questions following each passage. Read the following four passages carefully and choose the best answer to each question out of the four alternatives.

PASSAGE-I

The general reader enjoys cartoons for two reasons. First, these cartoons make him smile because they draw his attention to something that is unusual and unexpected. The cartoonist highlights some aspects of a well-known personality in the field of politics, social work, cinema, sports, business etc. and criticises the person involved. Here, the purpose is not to offend but to make him understand that there is something funny about his actions or behaviour. Secondly, the cartoonist may target some wrong practices or situations from different walks of life. Here, his aim is to use humour to not only criticize but also correct the wrong practices. In other words. correction through entertainment. The cartoonist can never beat around the bush because he needs to make his point with just a few strokes of his pen.

Political cartoons, that is, cartoons making humorous comments on current political situations and events are a regular feature of both English newspapers and regional language newspapers. They can be found in the editorial pages of a daily newspaper, in news magazines and on political websites. Political cartoons can be very funny, especially if people can understand the message in the cartoon. Their main pupose, though, is not only to amuse him but also make him think about current events and influence his opinion about the events. The best political cartoonist uses humour so skilfully that the reader's own opinions on various political issues are formed even without him even realizing how it happened.

31. What are the aims of the cartoonist?
(1) To criticize people and all their practices.
(2) To be humorous and offend people.
(3) To make positive criticism about people and change wrong practices.
(4) To show the people funny things and criticize them.

32. What does the passage talk about?
(1) Cartoons and their purpose
(2) Cartoons in different language papers
(3) Humorous cartoons
(4) Cartoonists in India

33. Why does the cartoonist use humour?
(1) To influence public opinion.
(2) To help people have ideas about their society.
(3) To make people understand their duties.
(4) To change the political issues in the country.

34. Cartoons make the general reader smile because they make him notice something that is:
(1) general and unexpected
(2) curious and unusual.
(3) beautiful and unusual.
(4) uncommon and unexpected.

35. To beat around the bush means:
(1) to talk about a lot of unimportant things
(2) to give an example
(3) to highlight unique features
(4) to say what is most important

PASSAGE-II

For months the old tanker, African Queen , lay turned over on her side, stuck fast in the sands off the coast of Maryland. She had run aground so badly that her owners had decided to leave her to her fate. It was considered impossible to refloat her and the ship began to rust and sink deeper and deeper into the sands. Men frequently came out in small boats and removed any parts that could be sold-until two men decided to attempt the impossible : to float the African Queen once more. Both men were engineers and had no experience of ships so that few people thought they could succeed.

The men began by studying the exact state of the African Queen and came to the conclusion that she would float again if air was pumped into the tanks which were now full of sea-water. A diver was sent down to examine the underside of the ship. In the cold, dark water he found an enormous hole in her side which had been torn when the ship ran aground. It was plain that nothing could be done until the hole was repaired. As no single sheet of steel would cover it, the men were obliged to order a great number of sheets which had to be joined together. For several weeks divers worked continually to close the hole. At times, the sea was so rough that it was difficult to go down; and on more than one occasion, they had to contend with sharks.

At last the hole was covered and the men began to pump the seawater out of the ship's tanks. It seemed as if they were bound to succeed, for when the tanks were full of air, the African Queen began to stir in the water. The men could not understand why she still would not float until they discovered that her rudder was embedded in mud. Huge cranes were brought to haul the sunken rudder out and the ship was again afloat. By this time, the men were almost exhausted. They had worked ceaselessly for three months to save the African Queen and had succeeded when everyone thought they would fail. Now they stood on the bridge of the ship, tired but proud, as tugs brought the African Queen into the harbour.

36. Men frequently went out to the African Queen because
(1) It was a rare sight to see a sunken ship.
(2) They attempted to float the ship once again.
(3) They wanted to take parts of the ship and sell them.
(4) It was an interesting exercise.

37. How did the two men propose to float the ship again ?
(1) By sending divers to examine the damage.
(2) By closing the large hole in her side.
(3) By joining a large number of steel sheets together.
(4) By pumping air into the tanks.

38. What was the danger which the divers faced ?
(1) The rough sea.
(2) The cold and dark situation underwater.
(3) Having to contend with sharks.
(4) The cutting edges of the steel sheets.

39. The two men felt proud because
(1) They could float the ship in three months.
(2) They had succeeded when everyone thought they would fail.
(3) The African Queen was coming into the harbour.
(4) The African Queen began to stir in the water.

40. The part of the ship used for steering is called
(1) Rudder (2) Bridge
(3) Underside (4) Tank

PASSAGE - III

Speech is a great blessing but it can also be a great curse for while it helps us to make our intentions and desires known to our fellows, it can also if we use it carelessly make our attitudes completely misunderstood. A slip of the tongue, the use of an unusual word or of an ambiguous word may create an enemy where we have hoped to win a friend. Again different classes of people use different vocabularies and the ordinary speech of an educated man may strike an uneducated listener as showing pride; unwillingly we may use a word which bears a different meaning to our listeners from what it does to men of our own class. Thus speech is not a gift to use lightly without thought but one which demands careful handling, only a fool will express himself alike to all.

41. Speech is a great blessing,
(1) if we use it indiscriminately
(2) if we use it carefully
(3) if we use it to please others
(4) if we use it to play one against the other

42. Speech can also be a great curse
(1) if we express ourselves alike to all
(2) if we adopt different vocabularies to different classes of people
(3) if we always try to please every one with it
(4) if we always try to win friends with it

43. A slip of the tongue means
(1) biting the tongue while speaking
(2) telling lies to defend oneself
(3) using words carelessly
(4) incurring loss of profit in hasty bargain.

44. The passage reveals that
(1) the use of ambiguous and unusual words brings us friends.
(2) careless use of words creates enemies.
(3) careful use of words may bring us profit but not friends.
(4) speech always reflects one's attitudes.

45. A fool will express himself alike to all kinds and conditions of the men because
(1) he wants to play with people.
(2) he wants to deceive every one.
(3) he wants to amuse every one.
(4) he lacks the power of discrimination in the use of words.

PASSAGE-IV

They closed in on him three boys and one girl, silently, menacingly slow. The girl spoke first.

"It was him", she pointed an accusing finger at the boy. "He kicked me purposely, I am sure. He made me spill my, lunch all over the place, and ran away.

The boy stared at her, his face a mask of fear. He hadn't learned much Dutch in the six months of his stay in Amsterdam, despite the special language classes for foreign students in the afternoons.

His fists clenched and unclenched nervously as he desperately searched for words. But all that came to him was a confused jumble of Iranian phrases. He backed away. His eyes darted around the empty school yard nobody was in sight, not even the housekeeper.

"Look here, you bully ! " The leader's words hit him like a lash. "Teasing the girls, he ? Come on, apologise". The boy drew back. "Proud ? Eh ?" another boy sneered "Too proud to apologise ? He kicked the boy.

The boy stared at the children bewildered. "No," he murmured, "no"

"Apologise !" the girl echoed with a cruel smirk, "Apologise ! Or is it against your pride ?"

The boy didn't answer. "Speak up !" The leader struck the boy sharply on the shoulder. The boy didn't move. The next blow landed on his nose. For a moment he thought he would cry. But he didn't. He wiped his face with the back of his sleeve. Anger burnt in him, hot and explosive. That frightened him. "Come on", one of them said, he's asking for it."

They fell on him, punching him with knotted fists. Blows rained down on him Left-right-left..... . "Hold it! Stop it!" a voice cracked like a whip. Strong hands grabbed the children by their collars and pulled them away. They stood there, shifting uncomfortably, avoiding the eyes of the tall boy in the blue and yellow sweet–shirt.

"What's going on here ?", thundered Meer, the captain of the ' school's football team. "Why have you picked on him ? All of you ? This is not the way to settle an argument.

"You see", cried the girl, "he hit me hard. The least he can do is apologise. But he will not".

The tall lad turned to the Iranian boy looking at him with dark, serious eyes.

"Come on, boy, "he said kindly, "Reach out a hand and apologise".

The boy didn't move. He stood there tense. "Come on," urged Meer. "Be not proud. Apologise to these wild cats".

The dark eyes of the Iranian boy filled with misery. He swallowed hard.

"Come on, boy, why don't you ?"

A dry sob broke from the boy's lips "No, No". "Why not? For God's sake why not ?"

"Because,, "the boy's voice rose. "Because, I do not know 'apologise'. I no understand apologise'. I speak little Dutch, very little Dutch. Please forgive!

46. Which of the following is correct about the, boy "?
(1) He was quite at ease with Dutch
(2) He had been staying in Amsterdam for some years.
(3) He had not hit the girl.
(4) He was attending special Dutch classes

47. Which of the following is the meaning of the phrase "closed in on" as used in the passage ?
(1) shut down (2) encircled
(3) put down (4) restricted

48. Who came to the rescue of the boy
(1) School Principal
(2) Housekeeper
(3) Leader of the group
(4) Captain of the school's football team

49. Whom did Meer call "wild cats" ?
(1) The group of three boys and a girl
(2) Group of girls
(3) His school's football team
(4) Not mentioned

50. Why did the boy hit the girl ?
(1) She had teased him
(2) She was not sharing lunch with him
(3) He had some old score to settle
(4) Not mentioned

PASSAGE-V

From the outbreak of the Second World War, the Congress was in a dilemma. It had sympathy with the democracies and considered Fascism and Nazism as an evil. But it also realized that India could join in the struggle only as an equal to Britain. It wanted assurances about India's future within a definite time frame. Britain refused to give any pledge of granting Dominion Status to India within a specified time. All that Britain was prepared to promise was consultation with representatives of various communities, parties of India, including the princes for such modifications in the Government as might be necessary. Mahatma Gandhi was disappointed. He said, "The Viceroy's declaration shows clearly that there is to be no democracy for India. Another round table conference is promised at the end of the War. Like its predecessor, it is bound to fail. The Congress asked for bread and it has got a stone."

The Congress Ministries in the provinces resigned when the Working Committee found that the British attitude was totally uncompromising. But still the Congress wanted to give Britain and her allies another chance. Gandhiji declared that he did not want to win freedom for India at the cost of ruin of the United Kingdom and was prepared to wait till the end of the war. The Congress had till then declared non–violence as its creed. In order to help bring about settlement it declared that non-violence was to be practised only for the internal struggle for freedom but was not suitable for defence against foreign aggression. The Working Committee went a step forward when it extended a hand for co-operation in the war effort provided a national government was formed. This was the furthest that the Congress could go.

51. When the War broke out, Congress faced which of the following issues ?
(1) Whether or not it should give full support to the Britain
(2) Whether to join the war as an equal of the Britain or otherwise
(3) Whether it should consider Fascism and Nazism as an evil
(4) Whether the Britain would give assurance about India's future

52. What was Britain's reaction over India's demand ?
(1) It assured to decide the future of India within a definite time frame
(2) It refused India's offer to join the war against Fascism and Nazism
(3) It promised India an equal status provided India supported the Britain
(4) It declined to give any assurance about granting freedom to India

53. To what extent did Britain yield to India's demand ?
(1) It assured to grant Dominion Status to India but without any specified time limit
(2) It refused to consult with any of the representatives
(3) It accepted to consult the representatives of different communities for modifications in he Government
(4) It accepted India's demand of considering Nazism and Fascism as an evil

54. Which of the following disappointed Mahatma Gandhi'?
(1) Britain's refusal to have sympathy for Fascism and Nazism
(2) The Viceroy's refusal to the demand for another round table conference
(3) The Viceroy's refusal to the demand for freedom for India
(4) Acceptance of the proposal of holding another round table conference

55. The Congress Ministries resigned their offices because
(1) the working committee's attitude was unfavourable to them
(2) the British had a stubborn approach towards India's post war status
(3) the working committee had, decided to give the Britain one more chance
(4) the Britain and her allies had moved away from Fascism

Directions (56-75) : In the following questions, some of the sentences have errors and some have none. Find out which part of a sentence has an error. The number of that part is your answer. If there is no error, the answer is (4) i.e. No error.

56. I found (1)/ the two first chapters of the book (2)/ particularly interesting. (3)/ No error (4).

57. Bacon, the father of the English essay (1)/ had a thirst (2)/ of knowledge. (3)/ No error (4).

58. The train had left (1)/ when he had reached (2)/ the station. (3)/ No error (4).

59. He said (1)/ that he will never (2)/ repeat the mistake. (3)/ No error (4).

60. I am able (1)/ to cope up with (2)/ all these difficulties. (3)/ No error (4).

61. I wish I am (1)/ the richest person (2)/ in the whole wide world. (3)/ No error (4).

62. She is confident (1)/ to win the gold medal (2)/ this time. (3)/ No error (4).

63. They boy laid in the shelter (1)/ for a long time before (2)/ somebody came to rescue him. (3)/ No error (4).

64. Standing at (1)/ the top of the hill, (2)/ the houses below were hardly visible. (3)/ No error (4).

65. Kambli is one of the players (1)/ who has been selected (2)/ for the test match. (3)/ No error (4).

66. The report has been (1)/ prepared on the basis (2)/ of information we had and on our judgement. (3)/ No error (4)

67. Why we do not (1)/ meet to discuss (2)/ this matter in detail on next Friday ? (3)/No error (4)

68. Had we know (1)/ that there was a catch (2)/ in the offer we would not have accepted it.(3)/No error (4)

69. One of the secret (1)/ of success is (2)/ to keep up trying and not to give up. (3)/No error (4)

70. The present study have been designed (1)/ to examine whether or not (2)/ traditional approaches are still applicable. (3)/No error (4)

71. If you inform me (1)/ of your's arrival time (2)/ I shall come to meet you at the airport. (3)/ No error (4)

72. Provided you promise (1)/ me not to repeat this (2)/ 1 shall not allow you to take it up. (3)/ No error (4)

73. You cannot be (1)/ granted admission (2)/ unless you do not submit all the certificates in original. (3)/No error (4)

74. I promise (1)/ to teach you (2)/ everything you need to known. (3)/No error (4)

75. To arrive at a decision (1)/ all the interesting parties (2)/ should be invited and involved in discussion. (3)/No error (4)

Directions (76-80) : In the following questions, out of the four alternatives, choose the one which expresses the **right meaning** of the given word.

76. DUBIOUS
(1) doubtful (2) disputable
(3) duplicate (4) dangerous

77. FLABBERGASTED
(1) scared
(2) embarrassed
(3) dumbfounded
(4) humiliated

78. ETERNAL
(1) innumerable
(2) unmeasurable
(3) prolonged
(4) perpetual

79. GENUINE
(1) authentic (2) legitimate
(3) reliable (4) pure

80. OBSCENE
(1) indecent (2) incorrigible
(3) ridiculous (4) intolerable

Directions (81-85) : In the following questions, out of the four alternatives choose the word **opposite** in meaning to the given word.

81. DESPAIR
(1) Belief (2) Trust
(3) Hope (4) Faith

82. IN TOTO
(1) Bluntly (2) Partially
(3) Entirely (4) Strongly

83. PROTEAN
(1) Amateur (2) Catholic
(3) Unchanging(4) Rapid

84. PREDILECTION
(1) Acceptance(2)Attraction
(3) Dislike (4) Choice

85. ADMONISH
(1) Condemn (2) Bless
(3) Praise
(4) Congratulate

Directions (86-95) : In the following questions, sentences have been given with blanks to be filled in with an appropriate and suitable word. Four alternatives have been suggested for each question. Choose the correct alternative out of the four.

86. Are you really desirous _____ visiting Japan ?
(1) of (2) in
(3) to (4) about

87. When Indians from the south move north, they find certain aspects of life quite ____ from their own.
(1) strange (2) separate
(3) different (4) divergent

88. The sky is overcast, we _____ the storm will soon burst.
(1) expect (2) hope
(3) trust (4) suspect

89. Population increase ____ with depletion of foreign reserves has led to great daily hardships.
(1) joined (2) mixed
(3) added (4) coupled

90. The National Anthem is _____ at every official function.
(1) uttered
(2) sung
(3) whispered
(4) chanted

91. The doctor took out his _____ to examine the patient.
(1) horoscope
(2) microscope
(3) telescope
(4) stethoscope

92. The candidate's exposition was ____ for its brevity and clarity.
(1) complimentary
(2) conspicuous
(3) incomprehensible
(4) remarkable

93. The new India that Nehru led called itself a sovereign _____ Democratic Republic.
(1) capitalist
(2) revisionist
(3) populist
(4) socialist

94. _____ you work hard, you won't be able to clear even the preliminaries.
(1) If (2) Until
(3) Unless (4) Lest

95. Last year our company made a ____ of several lakhs of rupees.
(1) profit (2) gain
(3) rise (4) raise

Directions (96-105) : In the following questions, four alternatives are given for the **bold** idiom/phrase. Choose the alternative which best expresses the meaning of the underlined idiom/phrase.

96. The principal has to **carry out** the orders issued by the higher authorities.
(1) obey
(2) communicate
(3) execute (4) modify

97. The young engineer was hauled up for **spilling the beans** about the new project to the competitor.
(1) suppressing the information
(2) hiding the details
(3) revealing the information indiscreetly
(4) spoiling the plans

98. The Government claims that Indian industry is progressing **by leaps and bounds**.
(1) intermittently
(2) leisurely
(3) at a rapid pace
(4) at a desired pace

99. **Laying off of** thousands of workers is inevitable under the new economic policy.
(1) Dismissal from jobs of
(2) Offering new jobs to
(3) Reduction of workers' wages of
(4) Sending on leave

100. "**I take thee at thy word**", said Romeo to Juliet.
(1) Listen to you carefully
(2) Do not believe you
(3) Feel angry with you
(4) Truly believe you

101. People who do not **lay out** their money carefully, soon come to grief.
(1) earn (2) spend
(3) distribute (4) preserve

102. Having bought the house, they decided **to go the whole hog** and buy all the furniture needed.
(1) to live there
(2) to do it completely
(3) to go all the way
(4) to go in the fog

103. There is a lot of **bad blood** between them.
(1) jealousy (2) fight
(3) angry feeling
(4) distrust

104. The village headman pretends to be **a good samaritan**.
(1) a religious person
(2) a helpful person
(3) a citizen of Samaria
(4) a law-abiding citizen

105. The beleaguered politician was anxious to **set the record straight**.
(1) give a speech
(2) win party support
(3) give a correct account
(4) make a confession

Directions (106-115) : In the following questions, out of the four alternatives, choose the one which can be substituted for the given words/sentence

106. To be biased against
(1) Partial (2) Objective
(3) Prejudiced (4) Predestined

107. Motion of head, hands etc., as a mode of expression indicating attitude
(1) Gesture (2) Grin
(3) Gestation (4) Grimace

108. Bitter and violent attack in words
(1) Diaspora (2) Diacritics
(3) Diadem (4) Diatribe

109. Treatment by means of exercise and massage
(1) Chemotherapy
(2) Hydrotherapy
(3) Physiotherapy
(4) Psychotherapy

110. The abandonment of one's country or cause
(1) Defection (2) Disloyalty
(3) Desertion (4) Migration

111. A place where birds are kept
(1) Aquarium (2) Den
(3) Aviary (4) Sanctuary

112. A method which never fails
(1) Unflinching
(2) Irreparable
(3) Irremediable
(4) Infallible

113. Something which cannot be believed
(1) Inevitable (2) Ineffable
(3) Incredible (4) Ineluctable

114. Body of a human being or animal embalmed for burial
(1) Corpse (2) Mummy
(3) Morgue (4) Mortuary

115. Of very bad morals; characterised by debasement or degeneration.
(1) Desultory (2) Dilapidated
(3) Depraved (4) Dilatory

Directions (116-120) : In the following questions, four words are given in each question, out of which only one word is wrongly spelt. Find the misspelt word.

116. (1) Accomplice
(2) Accompaniment
(3) Accomplishment
(4) Accomodation

117. (1) Replaceable
(2) Replaceing
(3) Replacement
(4) Replaced

118. (1) Relieve (2) Protein
(3) Deceit (4) Frieght

119. (1) Labrinth
(2) Laboratory
(3) Laborious (4) Library

120. (1) Commit (2) Comedian
(3) Committee
(4) Comunication

Directions (121-140) : In following questions, a part of the sentence is printed in **bold**. Below are given alternatives to the **bold** part at 1, 2 and 3 which may improve the sentence. Choose the correct alternative. In case no improvement is needed, your answer is '4'.

121. He **declined** all the allegations against him.
(1) spurned (2) refused
(3) refuted
(4) No improvement

122. It is time we **leave**.
(1) left
(2) have to leave
(3) would leave
(4) No improvement

123. We spent an **hour discussing about his character.**
(1) on his chracter
(2) of his character
(3) upon his character
(4) his character

124. **After the letter reached me,** I shall know the result.
(1) After the letter reaches
(2) After the letter will reach
(3) After the letter has reached
(4) No improvement

125. I **have returned** the library books yesterday.
(1) had returned
(2) have had returned
(3) returned
(4) No improvement

126. How long **are you working here** ?
(1) have you been working here ?
(2) you are working here
(3) were you working ?
(4) No improvement

127. The officer asked his secretary to **remember** him about the meeting.
(1) recall (2) remind
(3) recollect
(4) No improvement

128. I acquainted him **about** the facts of the case.
(1) with (2) on
(3) to
(4) No improvement

129. He **denied** to be party to the deal.
(1) refused (2) disagreed
(3) rejected
(4) No improvement

130. It is necessary to consider separately these problems, **is indeed** ?
(1) is that it ? (2) isn't it ?
(3) are they ?
(4) No improvement

131. To learn a language well, one must have patience and **readiness to work** hard.
(1) readiness to working
(2) be ready to working
(3) ready to working
(4) No improvement

132. You can't imagine **that she is rude and arrogant**.
(1) that she is rudely and arrogant
(2) how rude and arrogant she is
(3) what rudeness and arrogance she has
(4) No correction required

133. The train is running **late** time.
(1) after
(2) behind
(3) off
(4) No improvement

134. When the party ended, the band **pack up** its equipment and left.
(1) will pack up
(2) will have packed up
(3) packed up
(4) No improvement

135. I **made** a lecture.
(1) will make (2) gave
(3) would make
(4) No improvement

136. They **prevented** me from danger.
(1) was preventing
(2) were preventing
(3) protected
(4) No improvement

137. The room is **smoky.**
(1) by smokes
(2) filled with smoke
(3) with smokes
(4) No improvement

138. I really enjoyed the way the fashion show was executed and **I also very much liked its theme.**
(1) its theme conveyed
(2) and the executing of the fashion shows theme
(3) I really liked its theme
(4) No improvement

139. **Ronald might fail the test, in which point he'd re-sit it next year.**
(1) Ronald might fail the test, in which time he'd re-sit it next year.
(2) Ronald might failed the test, in which point he'd re-sit it next year.
(3) Ronald might fail the test, in which case he'd re-sit it next year.
(4) No improvement

140. **He saw looking through the window, the beggar standing right there.**
(1) He saw the beggar looking through the window standing right down there.
(2) He, looking through the window, saw the beggar standing right down there.
(3) Looking through the window, he saw the beggar standing right there.
(4) No improvement

Directions (141-160) : In the following questions, a sentence has been given in Active/Passive Voice. Out of the four alternatives suggested below, select the one which best expresses the same sentence in Passive/Active Voice.

141. Please give me your pen and take your seat.
(1) Let your pen given me and take your seat.
(2) You are requested to give me your pen and take your seat.
(3) You are warned to give me your pen and take your seat.
(4) You are ordered to give me your pen and take your seat.

142. The prisoner is known to have assaulted warden earlier too.
(1) It is known that the prisoner has assaulted the warden earlier too.
(2) The warden was assaulted by the prisoner earlier too.
(3) It is known that the warden has been assaulted by the prisoner earlier too.
(4) It is known that the warden has assaulted the prisoner earlier too.

143. Can she write an interesting story ?
(1) Can an interesting story be written for her ?
(2) Can an interesting story be written to her ?
(3) Can an interesting story be written by her ?
(4) Could an interesting story be written by her ?

144. The poet, Blake, wrote many poems for children.
(1) Many poems were written for children by the poet, Blake.
(2) Many poems were written by children for the poet, Blake.
(3) Many are the poems written by children for the poet Blake.
(4) Children wrote many poems by the poet Blake.

145. Each person exhibited various facial expressions.
(1) Various facial expressions are exhibited by each person.
(2) Various facial expressions were exhibited by each person.
(3) Various facial expressions were being exhibited by each person.
(4) Various facial expressions have been used by each person.

146. The school was damaged by the earthquake which caused havoc to other buildings as well.
(1) The earthquake damaged the school and other buildings.
(2) The earthquake damaged other buildings.
(3) The earthquake caused havoc to the school.
(4) The earthquake damaged the school besides causing havoc to other buildings.

147. You don't need to wind this watch.
(1) This watch need not be wound.
(2) This watch does not wind.
(3) This watch need not be wounded.
(4) This watch need not be winded up.

148. Has somebody broken the window ?
(1) Have the window been broken ?
(2) Had the window been broken by somebody ?
(3) Has the window been broken by somebody ?
(4) Has been the window broken ?

149. The children are making a noise.
(1) A noise is made by the children.
(2) A noise is being made by the children.
(3) The children should be making a noise.
(4) A nose has been made by the children.

150. The child's shrill wail broke the silence.
(1) The silence was being broken by the child's shrill wail.
(2) The child's shrill wail was broken by the silence.
(3) The silence was broken by the child's shrill wail.
(4) The silence was being broken by the child's shrill wail.

151. Who teaches you English ?
(1) By whom you are taught English ?
(2) By whom English is taught to you ?
(3) By whom was you taught English ?
(4) By whom are you taught English ?

152. Do not insult the poor.
(1) Let the poor not to insult.
(2) Let not the poor be insulted.
(3) Let the poor to be not insulted.
(4) Let us not insulted the poor.

153. It interests me.
(1) I have been interested in it.
(2) I am interested in it.
(3) I will be interested in it.
(4) I was interested in it.

154. The boy laughed at the lame man.
(1) The boy laughed seeing the lame man.
(2) The lame man was laughed at by the boy.
(3) The boy laughed when he saw the lame man.
(4) The lame man was laughed by the boy.

155. Rohit was taken to the hospital by the villagers.
(1) Rohit was helped by the villagers to reach the hospital.
(2) The villagers took Rohit to the hospital.
(3) The hospital was reached by the villagers with Rohit.
(4) The villagers reached the hospital with Rohit.

156. Complete the minutes of the last meeting.
(1) The last meeting's minutes are completed.
(2) The completed minutes of last meeting is to be tabled
(3) Minutes of the last meeting are to be completed.
(4) The meeting's last minutes are completed.

157. Grandfather was digging the flowerbeds.
(1) The grandfather was digging flowerbeds.
(2) The flowerbeds were digging grandfather.
(3) Grandfather's flowerbeds were being dug.
(4) The flowerbeds were being dug by grandfather.

158. I will complete my project next week.
(1) Next week my project I will complete.
(2) Next week my project will be completed.
(3) My project will be completed by me next week.
(4) My project I will complete next week.

159. God helps those who help themselves.
(1) Those who help themselves help God.
(2) Those who help themselves are helped by God.
(3) Those who help God help themselves.
(4) Those who are helped by themselves are helped by God.

160. He will object to my proposal.
(1) My proposal will be objected to by him.
(2) The objection to my proposal will come from him.
(3) His objection will be to my proposal.
(4) There will be an objection to my proposal by him.

Directions (161-180) : In the following questions, the first and the last parts of the sentence are numbered 1 and 6. The rest of the sentence is split into four parts and named P, Q, R and S. These four parts are not given in their proper order. Read the parts and find out which of the four combinations is correct. Then find the correct answer.

161. 1. Early to bed, early to rise, makes a man healthy, wealthy and wise.
P. But for the morning tea, I had to wait for someone to get up before me.
Q. This saying inspired me to rise early.
R. That day I was the first to get up.
S. One day I got up early in the morning.
6. One day I realised that it was a waste of time to get up early and wait for the morning tea.
(1) QSRP (2) QPRS
(3) PQRS (4) SPQR

162. 1. A wood-cutter was cutting a tree on a river bank.
P. He knelt down and prayed.
Q. His axe slipped and fell into the water.
R. God Mercury appeared before him and asked about the matter.
S. He could not get it back as the river was very deep.
6. He dived into the water and came up with an axe of gold.
(1) RPQS (2) RPSQ
(3) QSRP (4) QSPR

163. 1. A dog stole a piece of a meat from a butcher's shop.
P. He barked in anger.
Q. He ran to the jungle with the piece of meat.
R. He saw his reflection.
S. He crossed a river on the way.
6. He lost his piece of meat.
(1) QPSR (2) QSRP
(3) QPRS (4) SRPQ

164. 1. Ramai and Samai were two poor young men.
P. On market day they sold their labour.
Q. The lived near Mahespur.
R. On other days, they remained in the village looking for work.
S. They wanted regular work.
6. The headman gave them two plots.
(1) QPRS (2) RPQS
(3) SPQR (4) PQRS

165. 1. Roger wanted to become a doctor.
P. He put away enough money to pay his first year fees.
Q. They could not afford the fees.
R. Undaunted, he got himself a job in the dockyard.
S. However, he came from a poor family.
6. Once enrolled, he was recognised as a gifted student, and scholarships took care of the rest of this studies.
(1) SRPQ (2) PRSQ
(3) SQRP (4) QRSP

166. 1. I went to my friend last week.
P. He politely refused to oblige me.
Q. I did not speak even a single word.
R. Actually I wanted his scooter for a day.
S. I felt ashamed of my self.
6. I was mistaken in assessing a true friendship.
(1) RPQS (2) PRQS
(3) SRPQ (4) QRSP

167. 1. He wanted to adopt his father's profession.
P. He was influenced by his strong desire to see India free.
Q. From now on, he was a changed man.
R. He made up his mind.
S. He came in contact with Mahatma Gandhi.
6. He wished to change the lot of the naked and hungry masses of India.
(1) QRPS (2) SPRQ
(3) RSPQ (4) PQSR

168. 1. Reena made a cup of tea in this manner.
P. Next, she added milk and sugar.
Q. When the water was boiling she added tea-leaves.
R. She turned off the gas.
S. First she put the water to boil.
6. Finally, she poured the tea into cup.
(1) SQPR (2) QPRS
(3) PRSQ (4) RSQP

169. 1. Once upon a time, there was a little man.
P. Some people called him Rabi.
Q. He walked like a rabbit.
R. His face and hands were brown.
S. That is why people called him Brownie.
6. But his real name was Thomas Cook, though he never cooked anything.
(1) QPSR (2) SRPQ
(3) RSQP (4) RQPS

170. 1. She was an old woman with a large purse that had everything in it.
P. It was about eleven O'clock at night.
Q. It had a long strap.
R. She carried it slung across her shoulder.
S. A boy ran up behind her.
6. He tried to snatch her purse.
(1) PQRS (2) SQRP
(3) QRPS (4) SRQP

171. 1. When a boy grows into a young man, he finds himself in a new and strange world.
P. The relationship remains but its nature changes.
Q. The emotional ties that he had with them are now loosened.
R. The old pattern of his life in which his parents were the nucleus around which his life revolved now undergoes a change.
S. He finds in himself an emotional void which he must somehow fill.

6. At this stage of his life he is like a body without a soul, an eye without light or a flower without fragrance.

(1) PRQS (2) RQPS
(3) RSQP (4) SRPQ

172. 1. Ingratitude stings strongest where relationship is closetst.
P. Expectation turns innocent relationship into commerce.
Q. Human relationship is adulterated with sly commerce.
R. In commerce, of course, give and take is understood.
S. Most relationships are founded on mutual expectations.
6. From any warm and healthy human relationship expectation of returns has to be weeded out.

(1) PQRS (2) QSPR
(3) RPSQ (4) SRQP

173. 1. If you want to do well in your examinations you need to be able to think for yourself which means not just following the guidebooks but write what you think yourself.
P. That will not help much.
Q. Few if any students do this.
R. By discussing things with other students, with your teachers, and with any intelligent people you meet you will find you can pick up a lot of new ideas but it is no good first accepting these ideas, swallowing them undigested and then repeating them in the examination.
S. At first you will find it difficult but if you go on trying you will find clear independent thought becomes easier.
6. If however you turn these ideas over in our mind accepting those which you agree with and fitting them into your stock of knowledge and rejecting the others you may get somewhere.

(1) PSQR (2) QSRP
(3) RSQP (4) SRQP

174. 1. We are living in an age in which technology has suddenly 'annihilated distance'.
P. Are we going to let this consciousness of our variety make us fear and hate each other ?
Q. Physically we are now all neighbours, but physiologically we are still strangers to each other.
R. How are we going to react ?
S. We have never been so conscious of our variety as we are now that we have come to such close quarters.
6. In that event, we should be dooming ourselves to wipe each other our.

(1) PQSR (2) PSQR
(3) QSRP (4) RQSP

175. 1. As a dramatist Rabindranath was not what might be called a success.
P. His dramas were moulded more on the lines of the traditional Indian village dramas than the dramas of the modern world.
Q. His plays were more a catalogue of ideas than a vehicle of the expression of action.
R. Actually drama has always been the life of the Indian people, as it deals with legends of gods and goddesses.
S. Although in this short stories and novels he was able to create living and well-defined characters, he did not seem to be able to do so in his dramas.
6. Therefore, drama forms the essential part of the traditional Indian culture.

(1) QPRS (2) QSPR
(3) RSQP (4) SRQP

176. 1. One of the most dangerous insect pests in the locust.
P. At first they look just like ordinary grasshoppers, which are harmless and unable to fly very far.
Q. Until about thirty years ago, no one knew where locusts came from or why they appeared in the different countries they attacked.
R. Then they change in appearance and develop wings which enable them to fly long distances.
S. Then it was discovered that there are two stages in the life of locusts.
6. At this stage, they gather in huge numbers and rise from the ground on their powerful wings in cloud.

(1) PSQR (2) PSRQ
(3) QSPR (4) QSRP

177. 1. In 1857, fighting broke out all over the country.
P. Everywhere the people rose in rebellion.
Q. In March 1858 British troops attacked the fort at Jhansi.
R. Thousands of people were killed on both sides.
S. The British fought back.
6. The Rani's troops fought back bravely.

(1) PSRQ (2) QSPR
(3) RPSQ (4) SQPR

178. 1. Savita was lonely in the house.
P. She was very good at that.
Q. She sat all day in a little room off the main drawing room.
R. She would sit on the rug and do needle work.
S. It was a little room with nothing in it but a few chairs and a rug.
6. It was the only thing she had learnt from the Convent School.

(1) PQRS (2) QSRP
(3) RSPQ (4) SRPQ

179. 1. We talk about democracy, but when it comes to any particular thing, we prefer a man belonging to our caste and community.
P. We must be in a position to respect a man as a man.
Q. It means our democracy is a phoney kind of democracy.
R. We must extend opportunities of development to those who deserve them.
S. Our weakness for our own caste and community should not influence our decision.
6. Favouritism and nepotism have been responsible for much discontent in our country.

(1) PQRS (2) QPRS
(3) RPQS (4) SRPQ

180. 1. A man handed a pair of trousers to the departmental store—clerk and said, "I'd like these altered please."
P. He said that free alteration is not possible without a receipt.
Q. The man said, "Okay, I'd like to return the trousers". The clerk took them back and returned his money.
R. The man pushed the money and said, "Now I want to buy them." The clerk put the trousers in a bag, issued a receipt and handed him both.
S. The clerk asked for the sales receipt but after searching his pockets the man replied that he had lost it.
6. Triumphantly he put the trousers and the receipt on the counter and said, "I'd like to have these altered, please."
(1) PSQR (2) PSRQ
(3) QRPS (4) SPQR

Directions (181–200): In the following questions, a sentence has been given in Direct/Indirect. Out of the four alternatives suggested, select the one which best expresses the same sentence in Direct/Indirect.

181. "I finished it several days ago," said Jack.
(1) Jack said that he finished it several days previously.
(2) Jack said that he had finished it several days earlier.
(3) Jack said that he finished it several days earlier.
(4) Jack said that he finish it several days ago.

182. "I gave the packet to Tom, who kept it a long time," said Pamela.
(1) Pamela said that she had gave the packet to Tom, who kept it a long time.
(2) Pamela said that she had given the packet to Tom, to keep for a long time.
(3) Pamela said that she had given the packet to Tom, who kept it a long time.
(4) Pamela said that she had given the packet to Tom, who kept it for long time.

183. "I was digging the garden when the doctor arrived," replied Harry.
(1) Harry said that he was digging the garden when the doctor arrived.
(2) Harry said that he had been digging the garden when the doctor arrived.
(3) Harry said that he had been digging the garden when the doctor arrive.
(4) Harry says that he was digging the garden when the doctor arrived.

184. "I would have been surprised if you had passed the examination," said the former master.
(1) The former master said that it would have surprised him if I had passed.
(2) The former master was surprised if I passed the examination.
(3) The former master said that he should be surprised if I had passed.
(4) The former master said that he would have been surprised if I had passed the examination.

185. "I will put this key here." said the caretaker.
(1) The caretaker says that he would put the key there.
(2) The caretaker said that he will put the key there.
(3) The caretaker said that he would put the key there.
(4) The caretaker says that he would put the key here.

186. "I shall go tomorrow," he said.
(1) He said that he would go the next day.
(2) He said that he shall go the next day.
(3) He said that he should go tomorrow.
(4) He said that he would go tomorrow.

187. Walter said, "I cannot do it now".
(1) Walter says that he cannot do it now.
(2) Walter said that he could not do it now.
(3) Walter says that he cannot do it then.
(4) Walter said that he could not do it then.

188. The master said that he would see me the next day.
(1) "You will be seen by me tomorrow," said the master.
(2) "1 will see you tomorrow," said the master.
(3) "Tomorrow, I will see you," says the master.
(4) "I will be seeing you tomorrow," said the master.

189. Father told Peter to clean his shoes.
(1) "Clean your shoes, Peter," says father.
(2) "Clean your shoes, Peter," told father.
(3) "Clean your shoes, Peter," asked father.
(4) "Clean your shoes, Peter," said father.

190. The girl said, "How happy I am !"
(1) The girl exclaimed that she is very happy.
(2) The girl said how happy she was.
(3) The girl said that she is very happy.
(4) The girl exclaimed that she was very happy.

191. He said, "I have been studying in this college for two years."
(1) He said he studied in that college for two years.
(2) He said he had studied in that college for two years.
(3) He said for two years he studied in that college.
(4) He said that he had been studying in that college for two years.

192. Mary said to Simon, "Sharon and Peter are getting engaged next month,"

(1) Mary told Simon that Sharon and Peter will be getting engaged next month.
(2) Mary told Simon that Sharon and Peter was getting engaged next month.
(3) Mary told Simon that Sharon and Peter were getting engaged next month.
(4) Mary told Simon that Sharon and Peter are getting engaged next month.

193. I said to my friend, "Can you pick me up after work ?"
(1) I told my friend to pick me up after work.
(2) I told my friend if I could pick him up after work.
(3) I asked my friend if he can pick me up after work.
(4) I asked my friend if he could pick me up after work.

194. Suman said to me, "Did you enjoy the Olympic Games in London ?"
(1) Suman asked me if I enjoyed the Olympic Games in London.
(2) Suman asked me if I was enjoyed the Olympic Games in London.
(3) Suman asked me if I had enjoyed the Olympic Games in London,
(4) Suman asked me did I enjoy the Olympic Games in London.

195. My friend told me, "This is not a good book to read."
(1) My friend told me that that was not a good book to read.
(2) My friend told me that that is not a good book to read.
(3) My friend told me that that will not be a good book to read.
(4) My friend told me that this was not a good book to read.

196. My cousin said, "My, roommate snored throughout the night."
(1) My cousin said that her room-mate had snored throughout the night.
(2) My cousin told me that her room-mate snored throughout the night.
(3) My cousin complained to me that her room-mate is snoring throughout the night.
(4) My cousin felt that her room-mate may be snoring throughout the night.

197. He asked his teacher, "Need I read this chapter ?"
(1) He asked his teacher whether there was a need to read that chapter.
(2) He asked his teacher whether he needed to read this chapter.
(3) He asked his teacher if it was necessary to read this chapter.
(4) He asked his teacher if he had to read that chapter.

198. He said, "What a beautiful scene !"
(1) He said that what a beautiful scene it was.
(2) He wondered that it was a beautiful scene.
(3) He exclaimed what a beautiful scene it was.
(4) He exclaimed that it was a very beautiful scene.

199. He said, " I saw a book here."
(1) He said that he saw a book here.
(2) He said that he saw a book there.
(3) He said that he had seen a book here.
(4) He said that he had seen a book there.

200. He said to me, "What time do the offices close ?"
(1) He wanted to know what time the offices close.
(2) He asked me what time did the offices close.
(3) He asked me what time the offices closed.
(4) He asked me what time the offices did close.

ANSWERS

1. (1)	2. (3)	3. (2)	4. (4)
5. (3)	6. (1)	7. (2)	8. (1)
9. (4)	10. (3)	11. (2)	12. (2)
13. (3)	14. (4)	15. (1)	16. (4)
17. (3)	18. (4)	19. (4)	20. (4)
21. (2)	22. (2)	23. (1)	24. (2)
25. (1)	26. (1)	27. (3)	28. (1)
29. (4)	30. (1)	31. (3)	32. (1)
33. (1)	34. (4)	35. (1)	36. (3)
37. (4)	38. (3)	39. (2)	40. (1)
41. (2)	42. (1)	43. (3)	44. (2)
45. (4)	46. (4)	47. (2)	48. (4)
49. (1)	50. (4)	51. (4)	52. (4)
53. (3)	54. (3)	55. (2)	56. (2)
57. (3)	58. (2)	59. (2)	60. (2)
61. (1)	62. (2)	63. (1)	64. (4)
65. (2)	66. (3)	67. (1)	68. (1)
69. (1)	70. (1)	71. (2)	72. (3)
73. (3)	74. (3)	75. (2)	76. (1)
77. (3)	78. (4)	79. (1)	80. (1)
81. (3)	82. (2)	83. (3)	84. (3)
85. (3)	86. (1)	87. (3)	88. (1)
89. (4)	90. (2)	91. (4)	92. (4)
93. (4)	94. (3)	95. (1)	96. (3)
97. (3)	98. (3)	99. (1)	100. (4)
101. (2)	102. (2)	103. (3)	104. (2)
105. (3)	106. (3)	107. (1)	108. (4)
109. (3)	110. (3)	111. (3)	112. (4)
113. (3)	114. (2)	115. (3)	116. (4)
117. (2)	118. (4)	119. (1)	120. (4)
121. (3)	122. (1)	123. (4)	124. (1)
125. (3)	126. (1)	127. (2)	128. (1)
129. (1)	130. (2)	131. (4)	132. (2)
133. (2)	134. (3)	135. (2)	136. (3)
137. (2)	138. (3)	139. (3)	140. (3)
141. (2)	142. (3)	143. (3)	144. (1)
145. (2)	146. (1)	147. (4)	148. (3)
149. (2)	150. (3)	151. (4)	152. (2)
153. (2)	154. (2)	155. (2)	156. (3)
157. (4)	158. (3)	159. (2)	160. (1)
161. (1)	162. (4)	163. (2)	164. (1)
165. (3)	166. (1)	167. (2)	168. (1)
169. (3)	170. (3)	171. (2)	172. (3)
173. (2)	174. (3)	175. (1)	176. (3)
177. (1)	178. (2)	179. (2)	180. (4)
181. (2)	182. (3)	183. (2)	184. (4)
185. (3)	186. (1)	187. (4)	188. (2)
189. (4)	190. (4)	191. (4)	192. (3)
193. (4)	194. (3)	195. (1)	196. (1)
197. (4)	198. (4)	199. (4)	200. (3)

EXPLANATIONS

11. (2) **eruption**
12. (2) **summit**
13. (3) **with** **14.** (4) **big**
15. (1) **flung** **16.** (4) **Speed**
17. (3) **of** **18.** (4) **oozed**
19. (4) **accompanied**
20. (4) **poured**
21. (2) **steadily**
22. (2) **increase**
23. (1) **major**
24. (2) **releases**
25. (1) **responsible**
26. (1) **another**
27. (3) **affected**
28. (1) **deny**
29. (4) **adopt**
30. (1) **one**

31. (3) To make positive criticism about people and change wrong practices.

32. (1) Cartoons and their purpose

33. (1) To influence public opinion.

34. (4) uncommon and unexpected.

35. (1) **to beat around the bush (Id.) :** to avoid talking about what is important

• Don't **beat around the bush** – get to the point.

36. (3)They wanted to take parts of the ship and sell them.

37. (4) By pumping air into the tanks.

38. (3) Having to contend with sharks.

39. (2) They had succeeded when everyone thought they would fail.

40. (1) Rudder

41. (2) if we use it carefully

42. (1) if we express ourselves alike to all

43. (3) using words carelessly

44. (2) careless use of words creates enemies.

45. (4) he lacks the power of discrimination in the use of words.

46. (4) He was attending special Dutch classes

47. (2) encircled

48. (4) Captain of the school's football team

49. (1) The group of three boys and a girl

50. (4) Not mentioned

51. (4) Whether the Britain would give assurance about India's future

52. (4) It declined to give any assurance about granting freedom to India

53. (3) It accepted to consult the representatives of different communities for modifications in he Government

54. (3) The Viceroy's refusal to the demand for freedom for India

55. (2) The British had a stubborn approach towards India's post war status

56. (2) Replace group of words **the two first chapters of the book** by **the first two chapters of the book**. When **cardinal** and **ordinal Adjectives** are used before a **Noun** in a sentence, then we should use **Ordinal Adjective** first and then the **Cardinal Adjective**.
Look at the sentences :
(i) I have read the three first chapters. (×)
(ii) I have read the first three chapters. (✓)

57. (3) **Preposition-for** should be used with the word **thirst**. Hence, replace **of knowledge** by **for knowledge**.

58. (2) If two actions are completed in the **past**, then **Past Perfect** is used for the action completed earlier and **Simple Past** is used for the later action.
Look at the sentences :
(i) The train **had started** before I **reached** the station.
(ii) I **had done** my exercise when she **came** to see me.
Hence, replace **when he had reached** by **when he reached**.

59. (2)In **Indirect statement**, if **Reporting Verb** is in **Past Tense**, the **Reported Speech** will also be expressed in **Past Tense**.
Hence, **He said that he would never**. will be correct sentence.

60. (2)The use of **up** with **cope** is superfluous. Hence, **to cope with** will be the correct usage.
Look at the sentences :
(i) He was not able **to cope with** the stresses and strains of the job.
(ii) Desert plants are adapted **to cope** with extreme heat.

61. (1) To express wish, condition or supposition, **Plural verb** is used with **Singular Subject**, which is called **Subjunctive Mood of Verb**.
Look at the sentences :
(i) I **wish** I **were** a prince.
[I wish to be a prince. — Present Time]
(ii) I **wish** I **were** rich.
[I wish to be rich. — Present Time]
Hence, **I wish I were** will be the correct usage.

62. (2) The word **confident** takes **Preposition-of**.
Look at the sentence :
(i) The team feels confident of winning.
Hence, **she is confident of winning**. will be the correct sentence.

63. (1)**The boy lay in the shelter** will be the correct sentence.

64. (4) **No error**

65. (2)When **one of** is used in a sentence, then **Noun/Pronoun** coming after **of** is considered **Antecedent** and we use **verb** accordingly. The **verb** is not used according to **one** that comes before **of**.
Look at the sentences :
(i) She is **one of those** who do not **accept** the view.
(ii) Dryden remains **one of those who** have set standards for English verse.
Hence, **Kambli is one of the players who have been selected** will be the correct sentence.

66. (3) Before the word **information**, **the** should be used as

information is followed by an **Adjective clause**.

Look at the sentences :

(i) **The books I have** are not new.

(ii) **The house which/that you have bought** is beautiful.

It should be noted that with definite specific reference, **the definite article** is used for all noun clauses

Where is ***the*** *pen*
Where is ***the*** *book* } ***I bought ?***
Where is ***the*** *ink*

67. (1) Replace group of words **Why we do not** by **Why do we not.**

Look at the sentences :

(i) What is you name ?

(ii) Why are you laughing ?

(iii) Who are you ?

68. (1) Replace by **know** by **known** as in **Past Perfect-V_3** should be used.

69. (1) Replace **secret** by **secrets** as **one of, each of, either, of, neither of** are followed by **plural** form of a **Noun or Pronoun**.

Look at the sentences :

(i) **One of** the **doctors** . . . . . .

(ii) **Each of** the **doors** . . . . . .

(iii) **One of them** . . . . . .

70. (1) Replace **have** by **has**.

71. (2) Replace **your's** by **your**. **your** is a **possessive adjective**. Note that **your, my, our, his, her, their (Possessive adjectives)** and **yours, my, our, hers, theirs (possessive pronouns)** are not followed by the **Apostrophe ['] or ['s]**.

72. (3) Replace **I shall not allow** by **I shall allow**. Here, **affirmative clause/sentence** should follow.

73. (3) Replace **you do not submit** by **you submit** as **unless, until, lest** has a sense of negativity.

74. (3) Replace **known** by **know** as the structure of an infinitive is : **to + V_1**

For example :

to **know**, to **go**, to **weep.**

75. (2) Replace **interesting** by **interested**.

For Example :

An **interesting** novel

The **interested** student

76. (1) The meaning of the word **Dubious (Adjective)** is suspicious; not certain or slightly suspicious about something; doubtful.

Look at the sentences :

(i) I was rather **dubious** about the whole idea.

(ii) They indulged in some highly **dubious** business practices to obtain their current position in the market.

Hence, the words **dubious** and **doubtful** are synonymous.

77. (3) The meaning of the word **Flabbergasted (Adjective)** is extremely surprised and/or shocked; astonished.

The meaning of the word **Dumbfounded** is unable to speak because of surprise.

Look at the sentence :

(i) The news left him dumbfounded.

Hence, the words **flabbergasted** and **dumb-founded** are synonymous.

78. (4) The meaning of the word **Eternal (Adjective)** is perpetual; without an end; constant; existing or continuing forever.

Look at the sentences :

(i) She is an **eternal** optimist.

(ii) I am tired of your **eternal** argu ments.

Hence, the words **eternal** and **perpetual** are synonymous.

79. (1) The meaning of the word **Genuine (Adjective)** is authentic; real; exactly what it appears to be; not artificial.

Look at the sentence :

(i) Only **genuine** refugees can apply for asylum.

Hence, the words **genuine** and **authentic** are synonymous.

80. (1)The meaning of the word **Obscene (Adjective)** is connected with sex in a way that most people find offensive; out — rageous; very shocking and unacceptable.

incorrigible (Adj.) means incurable ; having bad habits that cannot be changed/ improved

Look at the sentences :

(i) Most actresses receive **obscene** phone calls.

(ii) He earns an **obscene** amount of money.

Hence, the words **obscene** and **indecent** aresynonymous.

81. (3) The meaning of the word **Despair (Noun)** is the feeling of having lost all hope.

Look at the sentences :

(i) A deep sense of **despair** overwhelmed him.

(ii) He gave up the struggle in **despair**.

Hence, the words**hope** and **despair** areantonymous.

82. (2) The meaning of the word **In toto (Adverb)** is completely; including all parts.

The meaning of the word **Partially (Adverb)** is partly; not completely.

Look at the sentence :

(i) The road was **partially** blocked by a fallen tree.

Hence, the words **in toto** and **partially** are antonymous.

83. (3) The meaning of the word **Protean (Adjective)** is able to change quickly and easily.

Hence, the words **protean** and **unchanging** are antonymous.

84. (3) The meaning of the word **Predilection (Noun)** is partiality; liking; preference.

Hence, the words **dislike** and **predilection** are antonymous.

85. (3)The meaning of the word **Admonish (Verb)** is to tell somebody firmly that you do not approve of something that they have done; reprove; to strongly advise.

Look at the sentences :

(i) He was **admonished** for chewing gum in class.

(ii) A warning voice **admonished** him not to let this happen.

The meaning of the word **praise (Verb)** is to express your approval or admiration for somebody/something; compliment.

Look at the sentences :

(i) He praised his team for their performance.

Hence, the words **admonish** and **praise** are antonymous.

86. (1) **of** is the right usage

87. (3) **different** is the right usage

88. (1) **expect** is the right usage

89. (4) **coupled** is the right usage

90. (2) **sung** is the right usage

91. (4) **stethoscope** is the right usage

92. (4) **remarkable** is the right usage

93. (4) **socialist** is the right usage

94. (3) **unless** is the right usage

95. (1)**profit** is the right usage

96. (3)Phr.V. **carry out** means to do and complete a task

Look at the sentence :

(i) Extensive tests have been **carried out** on the patient.

The correct choice is **execute**

97. (3) Idiom **spill the beans** means to tell somebody something that should be kept secret/ private

Look at the sentence :

(i) My husband was afraid to **spill the beans** about the cost of his purchases.

The correct choice is **revealing the information indiscreetly.**

98. (3) Idiom **by leaps and bounds** means very quickly

Look at the sentence :

(i) Her health has improved **in leaps and bounds** Phr.V.

The correct choice is **at a rapid pace**.

99. (1) **laying off of** means to stop employing somebody because there is not enough work for them to do

Look at the sentence :

(i) 200 workers at the factory have been **laid off**

The correct choice is **dismissal from jobs of**

100. (4) **Truly believe you** is the right usage.

101. (2) Phr.V. **lay out** means to spend money

Look at the sentence :

(i) I had to **lay out** a forture on a new car.

The correct choice is **spend**

102. (2) Idiom **go the whole hog** means to do something thoroughly/ completely

Look at the sentence :

(i) I thought I might as well **go the whole hog** and buy a new one.

The correct choice is **to do it completely**

103. (3) Idiom **bad blood** means feelings of hatred/ strong dislike

Look at the sentence :

(i) There is no **bad blood** between us. I don't know why we should quarrel.

The correct choice is **angry feeling**

104. (2) Idiom **a good samaritan** means a person who gives help and sympathy to people who need it

Look at the sentence :

(i) In this neighbourhood you can't count on **a good Samaritan** if you get in trouble.

The correct choice is **a helpful person**

105. (3) Idiom **set the record straight** means to give people the correct information about something in order to make it clear that what they previously believed was in fact wrong

Look at the sentence :

(i) To **put the record straight**, I do not support that idea and never have done.

The correct choice is **give a correct account**

106. (3) **biased (against) (Phr.V.)** means having a tendency to show favour towards/ against one group of people/ one opinion for personal reasons; making unfair judgements

Look at the sentence :

(i) Their research was on a **biased** sample.

The correct choice is **prejudiced**

107. (1)

(1) **Gesture (N.) :** a movement that you make with your hands, your head/ your face to show a particular meaning

(2) **Gestation (N.) :** the process by which an idea/ a plan develops

(3) **Grimace (V.) :** to make an ugly expression with your face to show pain, disgust, etc.

Gesture is the right choice.

108. (4)

(1) **Diaspora (N.) :** the movement of people from any nation/ group away from their own country

(2) **Diacritics (N.) :** a mark such as an accent, placed over, under/through a letter in some languages, to show that the letter should be pronounced in a dfferent way from the same letter without a mark

(3) **Diadem (N.) :** a crown, worn especially as a sign of royal power

(4) **Diatribe (N.) :** a long and angry speech/ piece of writing attacking and criticizing somebody/ something

Diatribe is the right choice.

109. (3) **Physiotherapy** is the right usage

110. (3)

(1) **Defection (N.) :** the act of leaving a political party, country, etc. to join another that is considered to be an enemy

(2) **Desertion (N.) :** abandonment

The right choice is **desertion**

111. (3) **Aviary** is the right usage

112. (4)

(1) **Unflinching (Adj.) :** remaining strong and determined, even in a difficult/ dangerous situation

(2) **Infallible (Adj.) :** never making mistakes

The right choice is **infallible**

113. (3) **Incredible** is the right usage

114. (2) **Mummy** is the right usage

115. (3)

(1) **Desultory (Adj.) :** going from one thing to another, without a definite plan and without enthusiasm

(2) **Dilapidated (Adj.) :** old and in very bad condition

(3) **Depraved (Adj.) :** morally bad

(4) **Dilatory (Adj.) :** not acting quickly enough ; causing delay

The right choice is **depraved**

116. (4)The wrongly spelt word is **accomodation**

The correct spelling is **accommodation**.

117. (2)The wrongly spelt word is **replaceing**

The correct spelling is **replacing**.

118. (4)The wrongly spelt word is **frieght**

The correct spelling is **freight**.

119. (1)The wrongly spelt word is **labrinth**

The correct spelling is **labyrinth**.

120. (4)The wrongly spelt word is **comunication**

The correct spelling is **communication**.

121. (3) **refuted** is the right usage

122. (1) **left** is the right usage

123. (4) **his character** is the right usage

124. (1) **After the letter reaches** is the right usage

125. (3) **returned** is the right usage

126. (1)**have you been working here ?** is the right usage

127. (2) **remind** is the right usage

128. (1) **with** is the right usage

129. (1)**refused** is the right usage

130. (2)**isn't it ?** is the right usage

131. (4) **No improvement**

132. (2) **how rude and arrogant she is** is the right usage

133. (2) **Ahead of / behind time =** earlier/later than was expected

Hence, as the sense suggests, **behind** should be used here.

134. (3) The sentence shows past time. Hence, Past Simple i.e., packed up ……. should be used here.

135. (2) **Lecture** = a talk that is given to somebody to teach about a particular subject as part of a university or college course.

Hence, delivered/gave a lecture …… should be used here.

136. (3) Here, **protected** = (made sure that somebody/something was not harmed, damaged) should be used.

137. (2) **Smoky** = fall of smoke

e.g., a smoky atmosphere ; a smoky pub ; a smoky fire.

Hence, filled with smoke (Noun) …… should be used here.

138. (3) Here, I liked its theme very much/ I really (Adverb) liked its theme ….. should be used.

139. (3) Here, **in which case** should be used.

140. (3) Here, **Participle** i.e. looking through the window ….. should be used.

141. (2) You are requested + infinitive + object

142. (3) It is known + that + subject + has been + V_3

143. (3) Can + subject + be + V_3

144. (1) Subject + were + V_3 + object

145. (2) Subject + were + V_3 + by + object

146. (1) The earthquake damaged the school and other buildings.

147. (4) This watch need not be winded up.

148. (3) Has the window been broken by somebody ?

149. (2) A noise is being made by the children.

150. (3) The silence was broken by the child's shrill wail.

151. (4) By whom + is/am/are + subject + V_3 + object.

152. (2) Let + not + subject + be + V_3

153. (2) Subject + is/am/are + V_3 + preposition + object.

154. (2) Subject + was/were + V_3 + preposition

155. (2) Subject + V_2 + object (Active).

156. (3) Subject + is/am/are + to be + V_3

157. (4) Subject + was/were being + V_3 + by + object

158. (3) Subject + will/shall be + V_3 + by + object.

159. (2) Subject+is/am/are+V_3 + by + object,

160. (1) Subject + shall/will be + V_3 + preposition + by + object

161. (1) QSRP **162.** (4) QSPR

163. (2) QSRP **164.** (1) QPRS

165. (3) SQRP **166.** (1) RPQS

167. (2) SPRQ **168.** (1) SQPR

169. (3) RSQP **170.** (3) QRPS

171. (2) RQPS **172.** (3) RPSQ

173. (2) QSRP **174.** (3) QSRP

175. (1) QPRS **176.** (3) QSPR

177. (1) PSRQ **178.** (2) QSRP

179. (2) QPRS **180.** (4) SPQR

191. (4)Connective – that

I changes to **he**

Present Perfect Continuous ⇒ Past Perfect Continuous

192. (3)Said to ⇒ told

Present Continuous ⇒ Past Continuous

Next ⇒ following

193. (4)Said to ⇒ asked

Connective ⇒ if/whether

Can ⇒ could

Interrogative ⇒ Assertive

194. (3)said to ⇒ asked

Connective ⇒ if

Past Indefinite ⇒ Past Perfect (Assertive)

195. (1)Connective ⇒ that

This ⇒ that

Is ⇒ was

196. (1) My cousin said that her room-mate had snored throughout the night.

197. (4) He asked his teacher if he had to read that chapter.

198. (4) He exclaimed that it was a very beautiful scene.

199. (4) He said that he had seen a book there.

200. (3) He asked me what time the offices closed.

❐❐❐

SET 3 MODEL PRACTICE SET

PAPER–I ♦ Marks : 200 ♦ No. of Questions : 100 ♦ Time : 2 Hrs.

QUANTITATIVE ABILITIES

1. If $3x - 3 < 3 + \frac{x}{2}$ and $x - 2 \leq 6 + 2x$; then x can take which of the following values?
(1) 6 (2) 2
(3) 10 (4) –10

2. Two numbers are in the ratio 4 : 5. If their HCF is 16, then the sum of these two numbers is :
(1) 144 (2) 124
(3) 160 (4) 150

3. The value of
$\left(3+\sqrt{8}\right)+\frac{1}{3-\sqrt{8}}-\left(6+4\sqrt{2}\right)$ is
(1) 8 (2) 1
(3) $\sqrt{2}$ (4) 0

4. If a train runs at 60 km/h, it reaches its destination 15 minutes late. But, if it runs at 80 km/h, it is late by 7 minutes only. The right time for the train to cover its journey is :
(1) 18 minutes
(2) 17 minutes
(3) 20 minutes
(4) 21 minutes

5. If A and B are the H.C.F and L.C.M. respectively of two algebraic expressions x and y, and A + B = x + y, then the value of $A^3 + B^3$ is
(1) $x^3 - y^3$ (2) x^3
(3) y^3 (4) $x^3 + y^3$

6. The square root of which of the following is a rational number ?
(1) 1250.49 (2) 62,50.49
(3) 1354.24 (4) 5768.28

7. For how many integral values of 'x', $\sin\phi = \frac{(3x-2)}{4}$, where $0° \leq \phi \leq 90°$
(1) 2 (2) 3
(3) 0 (4) 1

8. If the internal bisectors of the $\angle ABC$ and $\angle ACB$ of ΔABC meet at O and also $\angle BAC = 80°$, then $\angle BOC$ is equal to
(1) 50° (2) 160°
(3) 40° (4) 130°

9. The value of $\left[\frac{\sin^2 24° + \sin^2 66°}{\cos^2 24° + \cos^2 66°} + \sin^2 61° + \cos 61° \sin 29°\right]$ is equal to :
(1) 2 (2) 3
(3) 1 (4) 0

10. The side of a rhombus is 5cm and one of its diagonal is 8 cm. What is the area of the rhombus ?
(1) 30 cm^2 (2) 20 cm^2
(3) 40 cm^2 (4) 24 cm^2

11. If A's income is 40% more than the income of B, then by what percentage B's income is less than income of A ?
(1) $27\frac{4}{7}\%$ (2) $28\frac{5}{7}\%$
(3) $27\frac{5}{7}\%$ (4) $28\frac{4}{7}\%$

12. Chord PQ is the perpendicular bisector of radius OA of a circle with centre O (A is a point on the edge of the circle). If the length of Arc PAQ = $\frac{2\pi}{3}$. What is the length of chord PQ ?
(1) 2 (2) $\sqrt{3}$
(3) $2\sqrt{3}$ (4) 1

13. There are 50 boxes and 50 persons. Person 1 keeps 1 marble in every box. Person 2 keeps 2 marbles in every 2nd box, person 3 keeps 3 marbles in every third box. This process goes on till person 50 keeps 50 marbles in the 50th box. Find the total number of marbles kept in the 50th box.
(1) 43 (2) 78
(3) 6 (4) 93

14. A, B and C started a business by investing Rs. 55,000, Rs. 65,000 and Rs. 75,000 respectively. A is a working partner and gets 20% of the profit and the remaining is distributed in the proportion of their investments. If total profit is Rs. 87,750, what is the share of A ?
(1) Rs. 27,000
(2) Rs. 37,500
(3) Rs. 23,000
(4) Rs. 37,350

15. The greatest number that divides 411, 684, 821 and leaves 3, 4 and 5 as remainders, respectively, is
(1) 254 (2) 146
(3) 136 (4) 204

16. If $x + y = 2a$, then the value of $\frac{a}{x-a} + \frac{a}{y-a}$ is
(1) 2 (2) 0
(3) 1 (4) –1

17. Terms a, 1, b are in Arithmetic Progression and terms 1, a, b are in Geometric Progression. Find 'a' and 'b' given $a \neq b$.
(1) 2,4 (2) –2, 1
(3) 4,1 (4) –2, 4

18. The successive discounts of 20%, 10% and 15% is equivalent to a single discount of :
(1) 43.5% (2) 42.2%
(3) 38.8% (4) 44.5%

19. The average monthly salary of all the employees in an industry is ₹ 12,000. The average salary of male employees is ₹ 15,000 and that of female employees is ₹ 8,000. What is the ratio of male employees to female employees ?
(1) 5 : 2 (2) 3 : 4
(3) 4 : 3 (4) 2 : 5

20. PA and PB are two tangents to a circle with centre O, from a point P outside the circle. A and B are points on the circle. If ∠APB = 40°, then ∠OAB is equal to:
(1) 40° (2) 20°
(3) 50° (4) 25°

21. A dealer buys a table listed at ₹ 1,500 and gets successive discounts of 20% and 10%. He spends ₹ 20 on transportation and sells at a profit of 20%. Find the Selling Price of the table (in rupees).
(1) 1320 (2) 1080
(3) 1200 (4) 1230

22. A sells an article to B at a gain of 20% and B sells it to C at a gain of 10% and C sells it to D at a gain of $12\frac{1}{2}$ %. If D pays ₹ 29.70, A purchased the article for
(1) ₹ 40 (2) ₹ 10
(3) ₹ 20 (4) ₹ 30

23. The radius of a cylinder is increased by 150% and its height is decreased by 20%. What is the percentage increase in its volume ?
(1) 400% (2) 600%
(3) 500% (4) 80%

24. Nitin borrowed some money at the rate of 6% p.a. for the first three years, 9% p.a. for the next five years and 13% p.a. for the period beyond eight years. If the total interest paid by him at the end of eleven years is ₹ 8,160, the money borrowed by him (in ₹) was
(1) 12,000 (2) 6,000
(3) 8,000 (4) 10,000

25. A boy started from his house by bicycle at 10 a.m. at a speed of 12 km per hour. His elder brother started after 1 hr 15 mins by scooter along the same path and caught him at 1.30 p.m. The speed of the scooter will be (in km/hr)
(1) 4.5 (2) 36
(3) $18\frac{2}{3}$ (4) 9

26. ABCD is a cyclic quadrilateral such that AB is a diameter of the circle circumscribing it and angle ADC = 140°. Then, angle BAC is equal to :
(1) 38° (2) 40°
(3) 50° (4) 60°

27. $4\frac{4}{5} \div \frac{3}{7}$ of $7 + \frac{4}{5} \times \frac{3}{10} - \frac{1}{5}$ is equal to :
(1) $\frac{7}{5}$ (2) $\frac{8}{5}$
(3) $\frac{34}{25}$ (4) $\frac{41}{25}$

28. An epidemic broke out in a village in which 5% of the population died. Of the remaining, 20% fled out of panic. If the present population is 4655, then the population of the village originally was
(1) 6000 (2) 6125
(3) 5955 (4) 5995

29. A candidate who gets 20% marks in an examination, fails by 30 marks. But if he gets 32% marks, he gets 42 marks more than the minimum pass marks. Find the pass percentage of marks.
(1) 52% (2) 20%
(3) 25% (4) 12%

30. A ladder leaning against a wall makes an angle α with the horizontal ground such that $\tan\alpha = \frac{3}{4}$. If the foot of the ladder is 5m away from the wall, what is the length of the ladder ?
(1) 5.25 m (2) 3.75 m
(3) 6.25 m (4) 4.5 m

31. A box contains ₹ 56 in the form of coins of one rupee, 50 paise and 25 paise. The number of 50 paise coins is double the number of 25 paise coins and four times the number of one rupee coins. How many 50 paise coins are there in the box?
(1) 52 (2) 64
(3) 32 (4) 16

32. The perimeter of an isosceles right angled triangle is 2p cm. Its area is
(1) $\left(3+2\sqrt{2}\right)$ p sq cm
(2) $\left(3-2\sqrt{2}\right)$ p² sq cm
(3) $\left(2-\sqrt{2}\right)$ p sq cm
(4) $\left(2+\sqrt{2}\right)$ p² sq cm

33. If
$$\left(\frac{x^l}{x^{-m}}\right)^{l^2+m^2-lm} \times \left(\frac{x^m}{x^{-n}}\right)^{m^2+n^2-mn} \times \left(\frac{x^n}{x^{-l}}\right)^{n^2+l^2-nl}$$
$= x^{2k}$, then the value of k will be
(1) l^3-m-n^3 (2) $l^3+m^3-n^3$
(3) $l^3+m^3+n^3$
(4) $l^3-m^3+n^3$

34. If $\sqrt{x}+\sqrt{x-\sqrt{1-x}} = 1$, then the value of x will be
(1) $\frac{25}{16}$ (2) $\frac{16}{23}$
(3) $\frac{16}{27}$ (4) $\frac{16}{25}$

35. If $\sqrt{u}+\sqrt{v}-\sqrt{w} = 0$, then the value of $(u+v-w)$ will be
(1) $2\sqrt{uv}$ (2) $\sqrt{uv}$
(3) $-\sqrt{uv}$ (4) $-2\sqrt{uv}$

36. The diameter of a copper sphere is 1 8 cm. The sphere is melted and is drawn into a long wire of uniform circular cross-section. If the length of the wire is 108 m, the diameter of the wire is
(1) 1 cm (2) 0.9cm
(3) 0.3 cm (4) 0.6 cm

37. The value of $\frac{1}{27}r^3 - s^3 + 125t^3 + 5rst$ will be how much if $s = \frac{r}{3} + 5t$

(1) 0 (2) 2
(3) 1 (4) –1

38. If surface area and volume of a sphere are S and V respectively, then value of $\frac{S^3}{V^2}$ is

(1) 36 π (2) 9 π
(3) 18 π (4) 27 π

39. $\frac{\tan\theta}{1-\cot\theta} + \frac{\cot\theta}{1-\tan\theta}$ is equal to

(1) 1 – tan θ – cot θ
(2) 1 + tan θ – cotθ
(3) 1 – tan θ + cot θ
(4) 1 + tan θ + cot θ

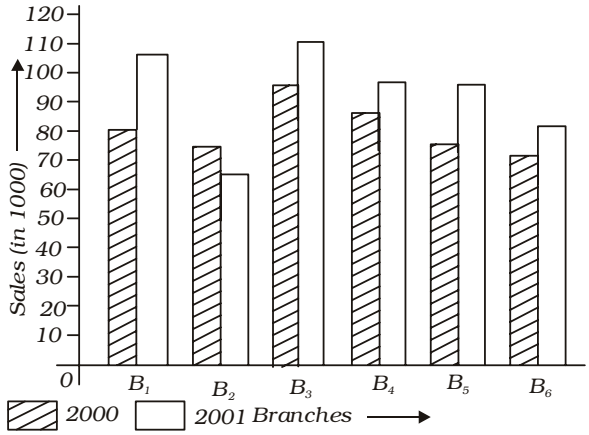
40. If $\sec\theta = x + \frac{1}{4x}$ $(0° < \theta < 90°)$, then sec θ + tan θ is equal to

(1) $\frac{x}{2}$ (2) $2x$
(3) x (4) $\frac{1}{2x}$

41. If $a = \sqrt{7} - \sqrt{5}$, $b = \sqrt{5} - \sqrt{3}$, $c = \sqrt{3} - \sqrt{7}$, then then value of $a^3 + b^3 + c^3 - 2abc$ will be

(1) $-4\sqrt{5} - 2\sqrt{3} + 2\sqrt{7}$
(2) $-4\sqrt{5} + 2\sqrt{3} - 2\sqrt{7}$
(3) $-4\sqrt{5} - 2\sqrt{3} - 2\sqrt{7}$
(4) $-4\sqrt{5} + 2\sqrt{3} + 2\sqrt{7}$

Directions (42 – 45) : Bar-chart showing the Sales of Books (in 1000) from six-branches B_1 B_2, B_3, B_4, B_5 and B_6 of a Publishing Company in 2000 and 2001 is given below. Study the chart and answer the questions.



42. Total sales of branch B_6 for both the years is what percent of the total sales of branch B_3 for both the years?

(1) 71.11% (2) 73.17%
(3) 68.54% (4) 77.26%

43. What is the ratio of the total sales of branch B_2 for both the years to the total sales of branch B_4 for both years ?

(1) 2 : 3 (2) 3 : 5
(3) 5 : 7 (4) 7 : 9

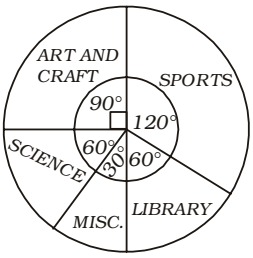
44. What percent of the average sales of branches B_1, B_3 and B_6 in 2000 is the average sales of branches B_1, B_2 and B_3 in 2001 ?

(1) 87.5%
(2) 75%
(3) 77.5% (4) 85%

45. What is the average sale of books from all the branches for the year 2000?

(1) 70 (2) 80
(3) 70.5 (4) 80.5

Directions (46–50) : The pie chart shows how the school funds is spent under different heads in a certain school. Using the pie chart answer the questions.



Misc. Miscellaneous

46. What percentage of the total expense is spent on library?

(1) 24.3 (2) 24
(3) 20 (4) 16.6

47. Which head uses 25% of the funds?

(1) Sports
(2) Misc
(3) Library
(4) Art and Craft

48. Which heads have the same amount of expenditure?

(1) Library and Science
(2) Sports and Science
(3) Science and Misc
(4) Misc and Library

49. Which head has the maximum expenditure?

(1) Art and Craft
(2) Sports
(3) Library
(4) Science

50. What is the ratio of expenditure on sports to that on art and craft?

(1) 1 : 1 (2) 4 : 3
(3) 1 : 4 (4) 2 : 1

51. A and B can do a job alone in 12 days and 15 days respectively. A starts the work and after 6 days B also joins to finish the work together. For how many days B actually worked on the job ?

(1) $3\frac{1}{3}$ (2) $9\frac{1}{3}$
(3) $5\frac{2}{3}$ (4) $6\frac{3}{8}$

52. Two pipes can fill a cistern separately in 24 minutes and 40 minutes respectively. A waste pipe can drain off 30 litres per minute. If all the three pipes are opened, the cistern fills in one hour. The capacity (in litres) of the cistern is
(1) 800 (2) 400
(3) 600 (4) 500

53. If h, C, V are respectively the height, the curved surface and the volume of a cone, then $3\pi Vh^3 - C^2h^2 + 9V^2 = ?$
(1) 0 (2) 3
(3) $\frac{1}{2}$ (4) 11

54. A field is in the form of a rectangle of length 18 m and width 15 m. A pit, 7.5 m long, 6 m broad and 0.8 m deep, is dug in a corner of the field and the earth taken out is evenly spread over the remaining area of the field. The level of the field raised is
(1) 12 cm (2) 14 cm
(3) 16 cm (4) 18 cm

55. Given : $\sqrt[3]{4}$, $\sqrt{3}$, $\sqrt[6]{25}$ and $\sqrt[12]{289}$, the greatest and least of them are respectively
(1) $\sqrt[12]{289}$ and $\sqrt[3]{4}$
(2) $\sqrt{3}$ and $\sqrt[3]{4}$
(3) $\sqrt[6]{25}$ and $\sqrt{3}$
(4) $\sqrt[3]{4}$ and $\sqrt[6]{25}$

56. The last digit, that is, the digit in the unit's place of the number $[(57)^{25} - 1]$ is
(1) 6 (2) 8
(3) 0 (4) 5

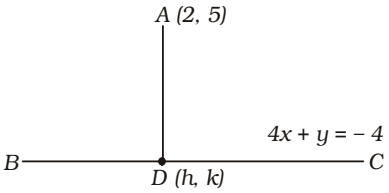
57. The sum of five consecutive integers is a and the sum of next five consecutive integers is b. Then $\frac{(b-a)}{100}$ is equal to
(1) $\frac{1}{4}$ (2) $\frac{1}{2}$
(3) 4 (4) 2

58. If $x = \frac{\sqrt{2}+1}{\sqrt{2}-1}$ and $xy = 1$, the value of $\frac{2x^2+3xy+2y^2}{2x^2-3xy+2y^2}$ is
(1) $\frac{71}{65}$ (2) $3+2\sqrt{2}$
(3) $\frac{81}{65}$ (4) $3-2\sqrt{2}$

59. A number N is a positive three-digit number. If x is in its hundred's place and y is in its unit's place, then the number $N - 100x - y$ is always divisible by
(1) 8 (2) 9
(3) 10 (4) 11

60. What is the angle between pair of straight lines represented by equation $5x^2 - 1112xy - 5y^2 = 0$
(1) 90° (2) 45°
(3) 30° (4) 60°

61. Find the foot of the perpendicular in the below figure



(1) 4, 2 (2) 4, –2
(3) –2, 4 (4) 2, 4

62. Rama's expenditure and savings are in the ratio 3 : 2. His income increases by 10 percent. His expenditure also increases by 12%. His savings increases by
(1) 7% (2) 10%
(3) 9% (4) 13%

63. If $m\tan(\theta - 30°) = n\tan(\theta + 120°)$, then the value of $\cos 2\theta$ equals to
(1) $\frac{1}{2}\left(\frac{m+n}{n-m}\right)$
(2) $\frac{1}{2}\left(\frac{n-m}{m+n}\right)$
(3) $\frac{1}{2}\left(\frac{m-n}{m+n}\right)$
(4) $\frac{1}{2}\left(\frac{m+n}{m-n}\right)$

64. The value of $\cot 7\frac{1}{2}°$ equals to
(1) $\sqrt{2}+\sqrt{3}+\sqrt{4}+\sqrt{6}$
(2) $\sqrt{3}+\sqrt{2}+\sqrt{6}+\sqrt{5}$
(3) $\sqrt{2}-\sqrt{3}-\sqrt{4}+\sqrt{6}$
(4) $\sqrt{2}-\sqrt{3}+\sqrt{6}-\sqrt{4}$

65. The base of a right pyramid is an equilateral triangle of side 4 cm. The height of the pyramid is half of its slant height. Its volume is
(1) $\frac{8}{9}\sqrt{2}$ cm³ (2) $\frac{7}{9}\sqrt{3}$ cm³
(3) $\frac{8}{9}\sqrt{3}$ cm³ (4) $\frac{7}{9}\sqrt{2}$ cm³

66. Water flows in a tank 150 m × 100 m at the base, through a pipe whose cross-section is 2 dm by 1.5 dm, at the speed of 15 km per hour. In what time will the water be 3 metres deep ?
(1) 100 hours (2) 120 hours
(3) 140 hours (4) 150 hours

67. A tent is of the shape of a right circular cylinder upto a height of 3 metres and then becomes a right circular cone with maximum height of 13.5 metres above the ground. If the radius of the base is 14 metres, the cost of painting the inner side of the tent at the rate of Rs. 2 per square metre is
(1) Rs. 2,050 (2) Rs. 2,060
(3) Rs. 2,068 (4) Rs. 2,080

68. $\tan 20° \tan 40° \tan 80°$ equals to
(1) $\frac{1}{\sqrt{3}}$ (2) $\frac{2}{\sqrt{3}}$
(3) $\sqrt{3}$ (4) $\sqrt{2}$

69. Rahim bought a gift item for Rs. 510 after getting a discount of 15%. He then sells it 5% - above the marked price. The profit earned in this deal is
(1) Rs. 150 (2) Rs. 120
(3) Rs. 100 (4) Rs. 90

70. If $\tan A = \frac{m}{m-1}$ and $\tan B = \frac{1}{2m-1}$, then the value of A – B equals to

(1) $\frac{\pi}{4}$ (2) $\frac{\pi}{2}$

(3) $\frac{2\pi}{3}$ (4) $\frac{\pi}{3}$

71. If $x + y + z - 1$, $xy + yz + zx = -1$, $xyz = -1$, then $x^3 + y^3 + z^3$ is

(1) –2 (2) –1

(3) 0 (4) 1

72. If $\sin x + \sin y = a$, $\cos x + \cos y = b$, then the value of $\cos(x - y)$ equals to

(1) $\frac{1}{2}(a^2 + b^2 + 2)$

(2) $\frac{1}{2}(a^2 + b^2 - 2)$

(3) $\frac{1}{2}(a^2 - b^2 + 2)$

(4) $\frac{1}{2}(a^2 - b^2 - 2)$

73. If $\frac{x}{3} + \frac{3}{x} = 1$ then the value of x^3 is

(1) 1 (2) 27

(3) 0 (4) –27

74. The area of the triangle, formed by the graph of $ax + by = c$ (where a, b are two positive real numbers) and the coordinate axes, is

(1) $\frac{c^2}{ab}$ sq. unit

(2) $\frac{a^2}{2bc}$ sq. unit

(3) $\frac{c^2}{2ab}$ sq. unit

(4) $\frac{a^2}{bc}$ sq. unit

75. A shopkeeper marks his goods at 40% above their cost price. He is able to sell $\frac{3}{4}$ th of his goods at this price, and the remaining at 40% discount. Assuming that the shopkeeper is able to sell all the goods he buys, find his loss or gain as % on the whole transaction.

(1) 20% loss (2) 23% loss

(3) 26% gain (4) 30% gain

76. A fruit seller bought 240 bananas at the rate of Rs. 48 per dozen. He sells half of them at the rate of Rs. 5 per banana. $\frac{1}{6}$ th of the remaining are found to be rotten. The price per banana at which he has to sell the remaining bananas to get a profit of 25% on his entire investment is

(1) Rs. 5.5 (2) Rs. 6.0

(3) Rs. 5.0 (4) Rs. 6.5

77. A man standing on the deck of a ship, which is 10m above the water level, observes the angle of elevation of the top of a hill as 60° and the angle of depression of the base of the hill 30°. The distance of the hill from the ship and the height of the hill is.

(1) 17.32m, 40 m

(2) 1.732 m, 40 m

(3) 40 m, 17.32 m

(4) 40 m, 1.732m

78. Rama mixes 20% of kerosene to his petrol and then he sells the whole mixture at the price of petrol. If the cost price of the kerosense is 40% of the cost price of petrol, what is the net profit percent ?

(1) 11.11% (2) 11.5%

(3) 12.5% (4) 9.5%

79. If a train runs at 40 km/hr, it reaches its destination late by 11 minutes, but if it runs at 50 km/hr, it is late by 5 minutes only. Find, the correct time for the train to complete its journey.

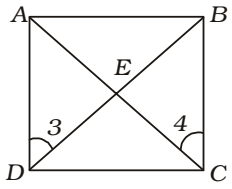
(1) 19 minutes

(2) 20 minutes

(3) 21 minutes

(4) 18 minutes

80. A square is given in which $\angle 3 = \angle 4$. Then which of them is correct



(1) ED = EC (2) ED ≠ EB

(3) ED > EB (4) ED < EB

81. AB is a diameter of the circle, CD is a chord equal to the radii of the circle. AC and BD when extended intersect at point E. $\angle AEB$ equals to

(1) 30° (2) 45°

(3) 60° (4) 65°

82. If $\sin\theta = a\cos\phi$ and $\cos\theta = b\sin\phi$, then the value of $(a^2 - 1)\cot^2\phi + (1 - b^2)\cot^2\theta$ is equal to :

(1) $\frac{a^2 + b^2}{a^2}$ (2) $\frac{a^2 + b^2}{b^2}$

(3) $\frac{a^2 - b^2}{b^2}$ (4) $\frac{a^2 - b^2}{a^2}$

83. If $x = \frac{1}{2 + \sqrt{3}}$ and $y = \frac{1}{2 - \sqrt{3}}$, then the value of $\left(\frac{1}{x+1} + \frac{1}{y+1}\right)$ is

(1) $\frac{1}{\sqrt{3}}$ (2) $\sqrt{3}$

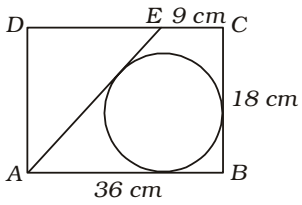
(3) 2 (4) 1

84. A man from the top of a 100 metre high tower sees a car moving towards the tower at an angle of depression of 30°. After some time, the angle of depression becomes 60°. The distance (in metres) travelled by the car during this time is

(1) $100\sqrt{3}$ (2) $\frac{200\sqrt{3}}{3}$

(3) $\frac{100\sqrt{3}}{3}$ (4) $200\sqrt{3}$

85. ABCD is a rectangle of sides 36 cm and 18 cm respectively. E is the point on side CD such that DE 9 cm. a circle is drawn as show in figure. Find the radius of circle.



(1) $4(15 - 2\sqrt{15})$

(2) $60 - 6\sqrt{13}$

(3) $6(5 - \sqrt{13})$

(4) $15 - 8\sqrt{17}$

86. If $x^2 + y^2 + z^2 + 2 = 2(y - x)$, then value of $x^3 + y^3 + z^3$ is equal to

(1) 0 (2) 1

(3) 2 (4) 3

87. O is the circumcentre of Δ ABC. If $\angle$ BAC = 85°, $\angle$ BCA = 75°, then $\angle$ OAC is equal to

(1) 70° (2) 60°

(3) 80° (4) 100°

88. The distance between the centres of the two circles with radii 4 cm and 9 cm is 13 cm. The length of the direct common tangent (between two points of contact) is

(1) 13 cm (2) $\sqrt{153}$ cm

(3) 12 cm (4) 18 cm

89. The barrel of a fountain pen, cylindrical in shape, is 7 cm. long and 0.5 cm. in diameter. A full barrel of ink in the pen can be used for writing 275 words on an average. The number of words would be written using a bottle of ink containing one-fourth of a litre will be

(1) 40,000 (2) 20,000

(3) 60,000 (4) 50,000

90. AB is a diameter of a circle with centre at O. DC is a chord of it such that DC || AB. If $\angle$BAC = 20°, then $\angle$ ADC is equal to

(1) 120° (2) 110°

(3) 115° (4) 100°

91. The tangents drawn at P and Q on the circumference of a circle intersect at A. If Ð PAQ = 68°, then the measure of the Ð APQ is

(1) 56° (2) 68°

(3) 28° (4) 34°

92. The equation of the line if its slope is $\frac{-3}{7}$ and it passes through the point (5, –2) is

(1) $3x + 7y = 29$

(2) $3x - 7y = 1$

(3) $3x + 7y = 1$

(4) $3x - 7y = 29$

93. If $\cot \frac{-5\pi}{4} = x$, then the value of x is

(1) $\sqrt{3}$ (2) 1

(3) –1 (4) $\frac{-1}{2}$

94. If $\cos\left(\frac{A}{2}\right) = x$, then the value of x is

(1) $\sqrt{\left[\frac{(1 - \cos A)}{2}\right]}$

(2) $\sqrt{\left[\frac{(1 + \sin A)}{2}\right]}$

(3) $\sqrt{\left[\frac{(1 - \sin A)}{2}\right]}$

(4) $\sqrt{\left[\frac{(1 + \cos A)}{2}\right]}$

95. If $2\,\text{cosec}^2 A = x$, then the value of x is

(1) $\frac{\sec A}{(\sec A - 1)} + \frac{\sec A}{(\sec A + 1)}$

(2) $\frac{\text{cosec } A}{(\sec A - 1)} + \frac{\text{cosec } A}{(\sec A + 1)}$

(3) $\frac{\sec A}{(\text{cosec } A - 1)} + \frac{\sec A}{(\text{cosec } A + 1)}$

(4) $\frac{\text{cosec } A}{(\text{cosec } A - 1)} + \frac{\text{cosec } A}{(\text{cosec } A + 1)}$

96. If $\frac{(1 + \cos A)}{2} = x$, then the value of x is

(1) $\sin^2\left(\frac{A}{2}\right)$ (2) $\sqrt{\sin\left(\frac{A}{2}\right)}$

(3) $\sqrt{\cos\left(\frac{A}{2}\right)}$ (4) $\cos^2\left(\frac{A}{2}\right)$

97. If secA + tanA = x, then the value of x is

(1) $\frac{\cos A}{(1 + \sin A)}$

(2) $\sqrt{\left[\frac{\cos A}{(1 - \sin A)}\right]}$

(3) $\sqrt{\left[\frac{\cos A}{(1 + \sin A)}\right]}$

(4) $\frac{\cos A}{(1 - \sin A)}$

98. A line passing through the origin perpendicularly cuts the line $3x - 2y = 6$ at point M. Find to co-ordinates of M.

(1) $\left(\frac{18}{13}, \frac{12}{13}\right)$ (2) $\left(\frac{18}{13}, \frac{-12}{13}\right)$

(3) $\left(\frac{-18}{13}, \frac{-12}{13}\right)$

(4) $\left(\frac{-18}{13}, \frac{12}{13}\right)$

99. A bucket made up of a metal sheet is in the form of frustum of a cone of height 16 cm with radii of its lower and upper ends as 8 cm and 20 cm, respectively. The cost of bucket, if the cost of metal sheet used is ₹ 15 per 100 cm^2 will be

(1) ₹ 290 (2) ₹ 390

(3) ₹ 293.90 (4) ₹ 299

100. If $2x - 2(3 + 4x) < -1 - 2x > \frac{-5}{3} - \frac{x}{3}$; then x can take which of the following values?

(1) 1 (2) 2

(3) –2 (4) –1

ANSWERS

1. (2)	2. (1)	3. (4)	4. (2)
5. (4)	6. (3)	7. (1)	8. (4)
9. (1)	10. (4)	11. (4)	12. (2)
13. (4)	14. (4)	15. (3)	16. (2)
17. (4)	18. (3)	19. (3)	20. (2)
21. (1)	22. (3)	23. (1)	24. (3)
25. (3)	26. (3)	27. (4)	28. (2)
29. (3)	30. (3)	31. (2)	32. (2)
33. (3)	34. (4)	35. (4)	36. (4)
37. (1)	38. (1)	39. (4)	40. (2)
41. (4)	42. (2)	43. (4)	44. (1)
45. (2)	46. (4)	47. (4)	48. (1)
49. (2)	50. (2)	51. (1)	52. (3)
53. (1)	54. (3)	55. (2)	56. (1)
57. (1)	58. (1)	59. (3)	60. (1)
61. (3)	62. (1)	63. (4)	64. (1)
65. (3)	66. (1)	67. (3)	68. (3)
69. (2)	70. (1)	71. (4)	72. (2)
73. (4)	74. (3)	75. (3)	76. (2)
77. (1)	78. (1)	79. (1)	80. (1)
81. (3)	82. (4)	83. (4)	84. (2)
85. (3)	86. (1)	87. (1)	88. (3)
89. (4)	90. (2)	91. (1)	92. (3)
93. (3)	94. (4)	95. (1)	96. (4)
97. (4)	98. (2)	99. (3)	100. (4)

EXPLANATIONS

1. (2) $3x - 3 < 3 + \frac{x}{2}$

$\Rightarrow 3x - \frac{x}{2} < 3 + 3$

$\Rightarrow \frac{6x - x}{2} < 6$

$\Rightarrow 5x < 6 \times 2$

$\Rightarrow x < \frac{12}{5}$

Again, $x - 2 \le 6 + 2x$

$\Rightarrow x - 2x \le 6 + 2$

$\Rightarrow -x \le 8$

$\Rightarrow x \ge -8$ i.e., $-8 \le x < \frac{12}{5}$

Clearly, $x = 2$

2. (1) Numbers = $4x$ and $5x$

LCM = $x = 16$

$\therefore$ Sum of numbers

$= 4x + 5x = 9x$

$= 9 \times 16 = 144$

3. (4) $\frac{1}{3-\sqrt{8}} = \frac{3+\sqrt{8}}{(3-\sqrt{8})(3+\sqrt{8})}$

(Rationalising the denominator)

$= \frac{3+\sqrt{8}}{9-8} = 3 + \sqrt{8}$

$\therefore$ Expression

$= 3 + \sqrt{8} + 3 + \sqrt{8} - 6 - 4\sqrt{2}$

$= 6 + 2\sqrt{8} - 6 - 4\sqrt{2} = 2\sqrt{8} - 4\sqrt{2}$

$= 2 \times 2\sqrt{2} - 4\sqrt{2} = 0$

4. (2) Let, distance = x km

Difference of time = 8 minutes

$= \frac{8}{60}$ hour $= \frac{2}{15}$ hour

$\therefore \frac{x}{60} - \frac{x}{80} = \frac{2}{15}$

$\Rightarrow \frac{4x - 3x}{240} = \frac{2}{15}$

$\Rightarrow x = \frac{2}{15} \times 240 = 32$ km

$\therefore$ Usual time

$= \left(\frac{32}{60} \times 60 - 15\right)$ minutes

= 17 minutes

5. (4) If $x = 2$, $y = 4$

A = 2, B = 4

$\therefore x + y = A + B$

$\therefore A^3 + B^3 = x^3 + y^3$

6. (3)

3	$\overline{13}\overline{54}.\overline{24}$	36.8
3	9	
66	454	
6	396	
728	5824	
8	5824	
	×	

$\therefore \sqrt{1354.24} = 36.8$

7. (1) $0 \le \phi \le 90°$

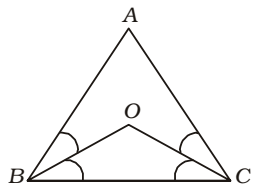
$\therefore \quad 0 \le \sin\phi \le 1$

$\because \quad \sin\phi = \frac{3x - 2}{4}$

When, $x = 1$, $\sin\phi = \frac{1}{4}$

$x = 2 = \sin\phi = \frac{4}{4} = 1$

8. (4)



$\angle BAC = 80°$

$\therefore \angle ABC + \angle ACB = 100°$

$\therefore \angle OBC + \angle OCB = 50°$

$\therefore \angle BOC = 180° - 50° = 130°$

9. (1) Expression

$= \frac{\sin^2 24° + \sin^2 66°}{\cos^2 24 + \cos^2 66°}$

$+ \sin^2 61° + \cos 61°. \sin 29°$

$= \frac{\cos^2(90° - 24°) + \sin^2 66°}{\sin^2(90° - 24°) + \cos^2 66°}$

$+ \sin^2 61° + \cos 61°.$ $\cos(90° - 29°)$

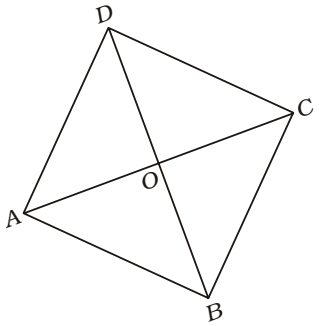
$= \frac{\cos^2 66° + \sin^2 66°}{\sin^2 66° + \cos^2 66°}$

$+ \sin^2 61° + \cos^2 61°$

[$\because \sin(90° - \theta) = \cos\theta$; $\cos(90° - \theta) = \sin\theta$]

$= 1 + 1 = 2$

10. (4)



AB = 5 cm

AC = 8 cm $\therefore$ AO = OC = 4 cm

$\angle AOB = 90°$

$\therefore$ OB $= \sqrt{AB^2 - AO^2}$

$= \sqrt{5^2 - 4^2} = \sqrt{(5+4)}$

$= \sqrt{9} = 3$ cm

$\therefore$ BD = 2 × 3 = 6cm

$\therefore$ Area of ABCD $= \frac{1}{2} \times$ AC × BD

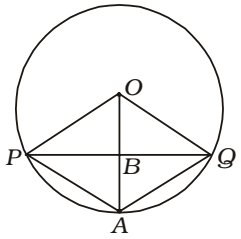
$\frac{1}{2} \times 8 \times 6 = 24$ sq. cm.

11. (4) Required per cent

$= \frac{x}{100+x} \times 100$

$= \frac{40}{140} \times 100 = \frac{200}{7} = 28\frac{4}{7}\%$

12. (2)



PQ is perpendicular bisector of OA.

$\therefore$ OP = OQ = PA = AQ

$\therefore$ OPAQ is a rhombus.

$\therefore$ $2 \angle$ PAQ = Reflex $\angle$POQ (The angle subtended at the centre by an arc is twice to that at the circumference).

$\Rightarrow$ $2 \angle$ PAQ = $360° - \angle$POQ

$\Rightarrow$ $3 \angle$ PAQ = 360°

($\because$ $\angle$PAQ = $\angle$POQ)

$\Rightarrow$ $\angle PAQ = 120° = \angle POQ = \frac{2\pi}{3}$

Again, radius (r) = $\frac{l}{\theta} = \frac{\frac{2\pi}{3}}{\frac{2\pi}{3}} = 1$

$\therefore$ From Δ OPB,

OP = 1 unit

$\angle$POB = 60°

$\therefore$ $\sin 60° = \frac{PB}{OP}$

$\Rightarrow$ $PB = \frac{\sqrt{3}}{2}$

$\therefore$ $PQ = 2 \times \frac{\sqrt{3}}{2} = \sqrt{3}$ unit

13. (4) Marbles in the 50th box will be kept by 1st, 2nd, 5th, tenth, 25th and 50th persons.

$\therefore$ Number of marbles

= 1 + 2 + 5 + 10 + 25 + 50 = 93

14. (4) Ratio of the shares of A, B and C = 55000 : 65000 : 75000

= 11 : 13 : 15

Sum of the terms of ratio

= 11 + 13 + 15 = 39

A's share

$= \text{Rs.}\left(87750 \times \frac{1}{5} + \frac{11}{39} \times \frac{4}{5} \times 87750\right)$

= Rs. (17550 + 19800)

= Rs. 37350

15. (3) Required number = HCF of 411 – 3 = 408; 684 – 4 = 680 and 821 – 5 = 816

HCF of 408 and 816 = 408

HCF of 408 and 680

$$\begin{array}{l} 408)\ 680\ (1 \\ \quad\ \underline{408} \\ 272)\ 408(1 \\ \quad\quad\ \underline{272} \\ 136)\ 272(2 \\ \quad\quad\quad\ \underline{272} \\ \quad\quad\quad\quad \times \end{array}$$

$\therefore$ Required number = 136

16. (2) $x + y = 2a = a + a$

$\Rightarrow x - a = a - y$

Expression = $\frac{a}{x-a} + \frac{a}{y-a}$

$= \frac{a}{x-a} - \frac{a}{a-y}$

$= \frac{a}{x-a} - \frac{a}{x-a} = 0$

17. (4) a, 1, b are in A.P.

$\therefore 1 = \frac{a+b}{2}$

$\Rightarrow a + b = 2$ ....(i)

Again, 1, a, b are in G.P.

$\therefore a^2 = b$ .....(ii)

$\therefore a + a^2 = 2$

$\Rightarrow a^2 + a - 2 = 0$

$\Rightarrow a^2 + 2a - a - 2 = 0$

$\Rightarrow a(a + 2) - 1(a + 2) = 0$

$\Rightarrow (a - 1)(a + 2) = 0$

$\Rightarrow a = -2, 1$

$\therefore b = 4$

18. (3) Marked price of article = Rs. 100

$\therefore$ Its S.P.

$= 100 \times \frac{80}{100} \times \frac{90}{100} \times \frac{85}{100}$

= Rs. 61.2

$\therefore$ Discount = 100 – 61.2

= Rs. 38.8 i.e. 38.8%

19. (3) Male employees = x

Female employees = y

$\therefore (x + y)\ 12000 = x \times 15000 + y \times 8000$

$\Rightarrow (x + y) \times 12 = 15x + 8y$

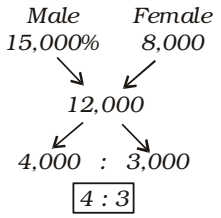
$\Rightarrow 12x + 12y = 15x + 8y$

$\Rightarrow 3x = 4y$

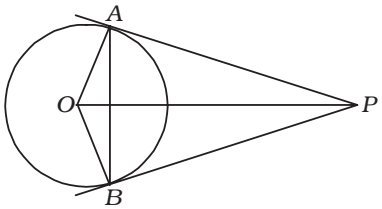
$\Rightarrow \frac{x}{y} = \frac{4}{3}$

Alliter :

Applying Alligation Concept:



20. (2)



$\angle$APB = 40°

$\therefore \angle OPA = \frac{40}{2} = 20°$

$\angle$OAP = 90°

$\therefore \angle AOB = 180° - (90° + 20°) = 70°$

$\therefore \angle BOA = 2 \times 70° = 140°$

OA = OB

$\therefore \angle OAB = \angle OBA$

$= \frac{1}{2}(180° - 140°) = 20°$

21. (1) Single equivalent discount

$= \left(20 + 10 - \frac{20 \times 10}{100}\right) = 28\%$

$\therefore$ C.P. of table = $\frac{1500 \times 72}{100}$

= Rs. 1080

Actual C.P. = 1080 + 20

= Rs. 1100

∴ Required S.P.

$= 1100 \times \frac{120}{100}$ = Rs. 1320

22. (3) C.P. for A = Rs. x

$\therefore x \times \frac{120}{100} \times \frac{110}{100} \times \frac{225}{200}$

= 29.70

$\Rightarrow x = \frac{29.70 \times 100 \times 100 \times 200}{120 \times 110 \times 225}$

= Rs. 20

23. (1) Volume of cylinder = $\pi r^2 h$

Percentage change in r^2

$= \left(150 + 150 + \frac{150 \times 150}{100}\right)\%$

= (300 + 225)%

= 525%

Percentage change in r^2h

$= \left(525 - 20 - \frac{525 \times 20}{100}\right)\%$

= (505 – 105)% = 400%

24. (3) If the sum of money be Rs. x, then

$\frac{x \times 6 \times 3}{100} + \frac{x \times 5 \times 9}{100} + \frac{x \times 3 \times 13}{100}$

= 8160

$\Rightarrow 18x + 45x + 39x = 816000$

$\Rightarrow 102x = 816000$

$\Rightarrow x = \frac{816000}{102} = Rs.\ 8000$

25. (3) Distance covered by cycling in $3\frac{1}{2}$ hours

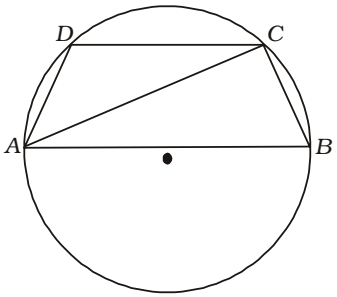
= Distance covered by scooter in $2\frac{1}{4}$ hours

$\Rightarrow 12 \times \frac{7}{2} = x \times \frac{9}{4}$

$\Rightarrow x = \frac{12 \times 7 \times 2}{9}$

$= \frac{56}{3} = 18\frac{2}{3}$ kmph

26. (3)



ABCD is a cyclic quadrilateral. AB = Diameter of circle.

∠ACB = Angle in semi-circle = 90°

∠ABC + ∠ADC = 180°

⇒ ∠ABC = 180°–140° = 40°

∴ ∠BAC = 90° – 40° = 50°

27. (4) Expression

$= \frac{24}{5} \div \left(\frac{3}{7} \times 7\right) + \frac{4}{5} \times \frac{3}{10} - \frac{1}{5}$

$= \frac{24}{5} \times \frac{1}{3} + \frac{6}{25} - \frac{1}{5}$

$= \frac{8}{5} + \frac{6}{25} - \frac{1}{5} = \frac{40 + 6 - 5}{25}$

$= \frac{41}{25}$

28. (2) Original population of village = x (let)

According to the question,

$x \times \frac{95}{100} \times \frac{80}{100} = 4655$

$\Rightarrow x = \frac{4655 \times 100 \times 100}{95 \times 80}$

= 6125

29. (3) Let the full marks of exam be x.

According to the question,

$\frac{x \times 32}{100} - \frac{x \times 20}{100} = 30 + 42$

$\Rightarrow \frac{12x}{100} = 72$

$\Rightarrow x = \frac{72 \times 100}{12} = 600$

∴ Minimum marks to pass

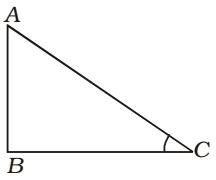
$= \frac{600 \times 20}{100} + 30$

= 120 + 30 = 150

∴ Required percentage

$= \frac{150}{600} \times 100 = 25\%$

30. (3)



AC = ladder

BC = 5 metre

∠ACB = α

$\therefore \tan\alpha = \frac{AB}{BC} \Rightarrow \frac{3}{4} = \frac{AB}{5}$

$\Rightarrow AB = \frac{15}{4}$ metre

$\therefore AC = \sqrt{AB^2 + BC^2}$

$= \sqrt{\left(\frac{15}{4}\right)^2 + (5)^2}$

$= \sqrt{\frac{225}{16} + 25}$

$= \sqrt{\frac{225 + 400}{16}} = \sqrt{\frac{625}{16}} = \frac{25}{4}$

= 6.25 metre

31. (2) Number of 1-rupee coins = x

Number of 50 paise coins = $4x$

Number of 25 paise coins = $2x$

∴ Ratio of their values

$= x : \frac{4x}{2} : \frac{2x}{4}$

= 2 : 4 : 1

∴ Value of 50-paise coins

$= \frac{4}{7} \times 56$ = Rs. 32

∴ Their number

= 32 × 2 = 64

32. (2)