Railway Recruitment Board

RRB

TECHNICIAN GRADE-III PRACTICE BOOK

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CONTENT

Tentative subject-wise break-up of questions and marks for CBT of Technician Grade III		
Subject	**No Of Questions**	**Marks for each section**
Mathmatics	**25**	**25**
General Intelligence & Reasoning	**25**	**25**
General Science	**40**	**40**
General Awareness	**10**	**10**
Total	**100**	**100**

Duration :

(i) 90 minutes (with 30 minutes extra time for PwBD candidates using scribe)

ii) The subject-wise distribution given above is merely indicative. The question papers may vary.

PRACTICE SET - 1

1. Which of the following number is NOT divisible by 8?
   (a) 35792   (b) 35112
   (c) 35412   (d) 35552

2. What is the sum of the squares of the numbers from 1 to 12?
   (a) 655   (b) 660
   (c) 650   (d) 665

3. The value of −261+(−380)−(−521)+821−(−121)
   (a) 800   (b) 825
   (c) 822   (d) 833

4. Which of the following fractions is the smallest?
   (a) $\dfrac{9}{11}$ (b) $\dfrac{11}{12}$
   (c) $\dfrac{8}{13}$ (d) $\dfrac{10}{14}$

5. The sum of two fractions is $\dfrac{7}{4}$. If one is $\dfrac{5}{3}$, find the another.
   (a) $\dfrac{1}{5}$ (b) $\dfrac{2}{1}$
   (c) $\dfrac{1}{12}$ (d) $\dfrac{1}{10}$

6. The LCM of the numbers 70, 28 and 42 is :
   (a) 116   (b) 420
   (c) 280   (d) 700

7. Find such greatest number which gives same remainders in each case when dividing 270, 675 and 1215.
   (a) 45   (b) 135
   (c) 270   (d) 75

8. A certain amount of money was divided between x and y in the ratio 4 : 3. If y's share is ₹2,400, the total initial amount is _____.
   (a) ₹8,000   (b) ₹7,200
   (c) ₹5,600   (d) ₹6,000

9. 20% of the population of a city died due to war and of the remaining population, 5% died in an epidemic. If the present population of the city is 15,200, then find the population of the city before the war.
   (a) 20,000   (b) 19,680
   (c) 23,500   (d) 20,100

10. 25% of a number is 7 more than 30% of another number. The difference between the numbers is 29. What are the numbers?
    (a) 39 and 10   (b) 40 and 11
    (c) 34 and 5   (d) 37 and 8

11. The length of the hypotenuse of a right-angled triangle is 13 cm and the length of one of the other two sides is 5 cm. What is the area (in cm²) of the triangle?
    (a) 28   (b) 29.5
    (c) 30   (d) 32.5

12. The length of a rectangular plot is 5 m more than its width. If the circumference of the plot is 142 m, find the dimensions of the plot.
    (a) Length 38 m and width 33 m
    (b) Length 39 m and width 34 m
    (c) Length 34 m and width 39 m
    (d) Length 33 m and width 38 m

13. A can do a piece of work in 15 day and B can do the same work in 20 days. The time taken by them working together to do the same work is:
    (a) $7\dfrac{4}{7}$ days   (b) $10\dfrac{4}{7}$ days
    (c) $8\dfrac{4}{7}$ days   (d) $9\dfrac{4}{7}$ days

14. Kishan cycled 96 km at a certain speed. If he cycled 4 km/h slower, then he would have taken an additional time of two hours to reach the destination. What is the speed, at which kishan actually cycled in km/h?
    (a) 12   (b) 18
    (c) 16   (d) 15

15. After 10 years the simple interest on a sum of money will be ₹600. If the principal is increased thrice after 5 years, what will be the total interest after 10 years?
    (a) ₹300   (b) ₹900
    (c) ₹1200   (d) ₹600

16. Rahul invested a certain sum for two years at 60% p.a. compound interest compounded annually. If at the end of two years he received interest of ₹ 11,700, then how much did he initially invest?
    (a) ₹ 8,000   (b) ₹ 7,250
    (c) ₹ 7,750   (d) ₹ 7,500

17. A person sells his goods at 30 % profit. If the cost price increases by 25%, and the selling price increases by 10% then what is his new profit percentage?
    (a) 16.4%   (b) 13.5%
    (c) 14.4%   (d) 15.6%

18. $\left(1-\dfrac{1}{n}\right)+\left(1-\dfrac{2}{n}\right)+\left(1-\dfrac{3}{n}\right)+\text{.......up to n terms}$ will result as:
    (a) $\dfrac{1}{2n}$ (b) $\dfrac{1}{2n-1}$
    (c) $\dfrac{1}{n^2}$ (d) $\dfrac{n-1}{2}$

19. Which of the following represents the right hand side (RHS) of the given equation ?

$$\sqrt{\frac{1+\sin A}{1-\sin A}} = ?$$

(a) $\dfrac{1}{\operatorname{cosec} A}$ (b) sec A + cot A

(c) sin A + cos A (d) sec A + tan A

20. Angles A, B and C of a triangle are in arithmetic progression. M is a point on BC such that AM is perpendicular to BC. What is $\dfrac{BM}{AB}$?

(a) $\dfrac{1}{2}$ (b) $\dfrac{3}{4}$

(c) $\dfrac{1}{3}$ (d) $\dfrac{1}{4}$

21. Find the arithmetic mean of the given frequency distribution.

Marks	Frequency
50	3
28	4
85	6
40	7

(a) 52.6 (b) 56.2
(c) 40.95 (d) 50.5

22. Solve the given equation

$$\sqrt{(544)^2 - (256)^2} = ?$$

(a) 144 (b) 480
(c) 288 (d) 400

23. The sum of the present ages of A and B is 30 years. The ratio of their ages after 5 years will be 3 : 2. The present age of A is :
(a) 11 years (b) 29 years
(c) 39 years (d) 19 years

24. What date was November, 2000 on Thursday?
(a) 21 November
(b) 2 November
(c) 10 November
(d) 2 and 16 November

25. If today is Thursday, what will be the day after 560 days?
(a) Thursday (b) Friday
(c) Wednesday (d) Sunday

26. Select the related word from the given alternatives:
Transport : Goods : : Bank : _____
(a) Money (b) Rupees
(c) Pound (d) Dollar

27. Select the most appropriate word with respect to the given group of items.

(a) Figure (b) Technology
(c) Culture (d) Fine Arts

28. If ACE = 35, AGED = 91 then CARE = ?
(a) 359 (b) 323
(c) 288 (d) 358

29. In a certain code language,
'never speak ill' is coded as 'ml un ha',
'fall ill often' is coded as 'ed pe ml',
'they speak often' is coded as 'ha ed os',
(Note : All codes are two letter codes only)
What is the probable code for 'they fall' in the given code language?
(a) os ml (b) ed pe
(c) pe os (d) ml ed

30. Four natural resources are listed, out of which three are alike in some manner and one is different. Select the odd one.
(a) Solar (b) Coal
(c) Wind (d) Water

31. The second number in each of the number-pairs is obtained by performing certain mathematical operations on the first number. Three of the following four number-pairs follow pattern and thus form a group. Select the number-pair that does NOT belong to that group.
(a) 14 : 197 (b) 19 : 363
(c) 17 : 290 (d) 13 : 170

32. Select the number from among the given options that can replace the question mark (?) in the following series.
86, 89, 95 , 104, ? , 131, 149
(a) 114 (b) 116
(c) 113 (d) 122

33. Find the missing term in the letter series.
BGL, DIN, ..., HMR
(a) FKP (b) FPK
(c) EJO (d) GLQ

34. Study the given pattern carefully and select the number that can replace the question mark (?) in it.
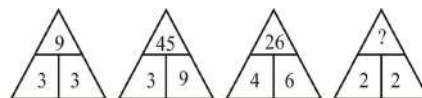
(a) 4 (b) 100
(c) 2 (d) 8

35. A man starts from point 'O', travels 20 km towards East to reach point 'A', turns right and travels 10 km to reach point 'B', turns right and travels 9 km to reach point 'C', turns right and travels 5 km to reach point 'D', turns left and travels 12 km to reach point 'E' and then turns right and travels 6 km to reach point 'F'.

In which direction is the man facing now ?
(a) West   (b) North
(c) East   (d) South

36. Pointing to a photograph John said, "She is the only grand daughter of the husband of my mother's sister." How is the person in the photograph related to John.
(a) Granddaughter   (b) Daughter
(c) Sister   (d) Niece

37. If 'A' stands for '–' 'B' stands for '+' and 'C' stands for '×', then what will be the value of 9C5B10A5C12?
(a) –6   (b) –5
(c) +6   (d) +5

38. Select the Venn diagram that best represents the relationship between computers, desktop and laptops.
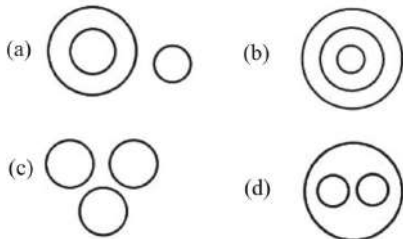
39. In the given figure, the circle denotes the dancers, the triangle represents the actors, and the square represents the singers. Whom does T represent?
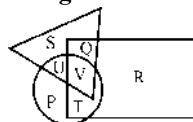
(a) Those dancers, who are singers but not actors
(b) Those dancers, who are not actors
(c) Those dancers, who are both singers and actors
(d) Dancers who are not singers

40. Select the Venn diagram that best represents the relationship between the following classes.
Players, Humans, Students
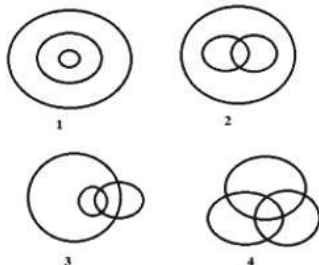
41. Statements:
1. All stars are planets.
2. All planets are moon.
Conclusions:
1. All moons are planet.
2. Some planets are star.
3. Some moons are stars.
4. All planets are stars.
(a) Conclusion 1, 3 and 4 follows
(b) Conclusion 2 and 3 follows
(c) Conclusion 1, 2 and 3 follows
(d) All the conclusion follows

42. Read the given statement and conclusions carefully. Assuming that the information given in the statements to be true even if they appears to be at variance with commonly known facts. Decide which of the given conclusions logically follows (s) from the given statements.
Statements:
Every hospital has patients.
Conclusions:
1. Patients are available only in hospitals.
2. Hospitals do not have patients.
(a) Only conclusion I follow.
(b) Either conclusion I or II follows
(c) Neither conclusion I nor II follows.
(d) Only conclusion II follows

43. Consider the given statement and decide which of the given assumptions is/'are implicit in the statement.
Statement:
"Invest in our schemes and double your money"– Statement by a marketing executive.
Assumptions:
1. The statements is an unrealistic assurance
2. People want to invest their savings to increase their income.
(a) Neither assumption 1 nor 2 is implicit.
(b) Only assumption 1 is implicit.
(c) Both assumptions 1 and 2 is implicit
(d) Only assumption 2 is implicit.
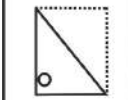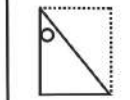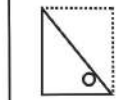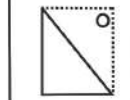
44. Who among P, Q, R, S and T is lightest in weight?
Statements:
1. Q's weight is less than P's and S's and S's weight is more than T's.
2. R's weight is more than Q's but less than T's.

(a) Statement 2 alone is sufficient while statement 1 alone is insufficient.

(b) Both statement 1 and 2 are sufficient.

(c) Neither statement 1 nor 2 is sufficient.

(d) Statement 1 alone is sufficient while statement 2 alone is insufficient.

45. If today (23/02/2012) is Thursday, then what day will it be after 91 days?
(a) Friday   (b) Wednesday
(c) Tuesday   (d) Thursday

46. What is the measure of the smaller of the two angles formed between the hour hand and the minute hand of a clock when it is 6:44 p.m.?
(a) 62°   (b) 83.5°
(c) 62.5°   (d) 84°

47. 24 students are sitting in a row. F is 17th from the right end and R is 19th from the left end. How many students are between F and R?
(a) 11   (b) 9
(c) 3   (d) 10

48. What would be the highest value of X in the given equation.
5X1 + 6Y7 + 3Z3 = 1471
(a) 5   (b) 6
(c) 7   (d) 3

49. In a class, Renu's rank is 15th from the bottom. If there are 30 students in the class, then what is her rank from the top:
(a) 15th (b) 17th
(c) 16th (d) 14th

50. Select the option that depicts the following transparent sheet (Question Figure) when folded at the dotted line shown.
Question Figure :

Answer Figure :-

A	B	C	D

(a) D   (b) C
(c) A   (d) B

51. The amount of radiation being emitted by a radioactive material is measured using the conventional unit ———.
(a) Watt   (b) Pascal
(c) Ampere   (d) Curie

52. The kinetic energy of an object is 120J and its mass is 15 kg Find the velocity of the object-

(a) 4 ms   (b) 4 ms^{-1}
(c) 4 ms^{-2} (d) 4 ms^{2}

53. A force of 350 N is applied to a mass of 500 kg. In this case what will be the acceleration generated in the object?
(a) 0.7ms^{2} (b) 0.7ms^{-2}
(c) 0.7ms^{1} (d) 0.7ms^{-1}

54. The force of buoyancy depends on the density and .... of the liquid displaces.
(a) The direction   (b) Volume
(c) Power   (d) Energy

55. If a wave completes 40 vibration in 2.5 seconds, then its frequency is :
(a) 16Hz   (b) 8Hz
(c) 50Hz   (d) 25Hz

56. A sound source sends a wave of 600 Hertz. This produces a wavelength of 3 m. Speed of sound wave in this question is. . . . .
(a) 1800 ms^{2} (b) 1800 ms^{-1}
(c) 1800 ms^{1} (d) 1800 ms^{-2}

57. Sound wave is not characterized –
(a) Amplitude   (b) Velocity
(c) The frequency   (d) Hertz

58. We see the color of grass as green because-
(a) It reflects green colored light back to our eyes
(b) It absorbs green light
(c) It reflects all light except green.
(d) It reflects white light on our eyes.

59. In the absence of atmosphere, the colour of the sky would be :
(a) blue   (b) white
(c) black   (d) red

60. A light ray passing through the _____ of a lens passes without any deviation.
(a) optical centre
(b) edges
(c) 2F (twice of focal length)
(d) Focus

61. Suppose a ball is placed in front of a concave mirror and a real image that is twice the size of the ball is formed on a screen. The ball and the screen are then moved until the image is five times the size of the object. If the shift of the screen is d, then the shift in the object is:
(a) $\dfrac{d}{18}$ (b) $\dfrac{d}{10}$
(c) $\dfrac{d}{15}$ (d) $\dfrac{d}{12}$

62. According the mirror formula, the focal length of a spherical mirror is equal to :
(a) $\dfrac{u-v}{uv}$ (b) $\dfrac{uv}{u-v}$
(c) $\dfrac{u+v}{uv}$ (d) $\dfrac{uv}{u+v}$

63. **The focal length of a spherical mirror is ....**
    (a) double its radius of curvature
    (b) three times its radius of curvature
    (c) half of its radius of curvature
    (d) its radius of curvature

64. **When a beam of light of wave lengths 4500 Å, 5400 Å, and 6000 Å respectively are passed through a prism then the angle of deviation is:**
    (a) more in light of 4500 Å
    (b) more in light of 6000 Å
    (c) equal in all
    (d) more in light of 5400 Å

65. **The apparent position of a star keeps on changing slightly because:**
    (a) the atmosphere scatters star light
    (b) the physical conditions of the atmosphere keep changing
    (c) the atmosphere consists of a mixture of gases
    (d) the physical conditions of the atmosphere are stationary

66. **Which of the following is true with respect to particles of solid?**
    (a) They move randomly.
    (b) There are large gaps between them.
    (c) They are configured in a systematic manner
    (d) They have minimum attraction.

67. **Which sub-atomic particle was discovered by J Chadwick?**
    (a) Proton
    (b) Electron
    (c) Neuron
    (d) Neutron

68. **What is the valency of carbon in carbon dioxide?**
    (a) 3
    (b) 4
    (c) 2
    (d) 1

69. **What will be the value of the solution, which turns the red litmus to blue?**
    (a) 5
    (b) less than 4
    (c) 6
    (d) more than 7

70. **The rule of octaves was applicable only till ……………….**
    (a) magnesium
    (b) zinc
    (c) calcium
    (d) bromine

71. **What is the first metallie element in the modern periodic table?**
    (a) Li
    (b) Na
    (c) He
    (d) H_2

72. **Which of the following statements is most appropriate for transition elements?**
    (a) Three of its outermost shells are incomplete.
    (b) Their outermost shells is incomplete.
    (c) Two of their outermost shells are incomplete.
    (d) They have eight electrons in the outermost shell.

73. **Which of the following has the maximum non-metallic characters in group 16 elements?**
    (a) Po
    (b) Se
    (c) S
    (d) O

74. **Which of the following reactions removes the highly reactive metals from the pure molten ore?**
    (a) Reduction by appropriate agent
    (b) Electrolysis
    (c) Calcination
    (d) Roasting

75. **Which gas is found in soda water?**
    (a) Freon
    (b) Hydrogen
    (c) Nitrogen
    (d) Carbon dioxide

76. **The study of hematology is related to ……….**
    (a) Plant reproductive system
    (b) Blood
    (c) Food habits of animals
    (d) Bones

77. **Which is the fat-accumulating tissue in our body?**
    (a) Epithelial tissue
    (b) Vascular tissue
    (c) Areolar tissue
    (d) Adipose tissue

78. **What is the complete form of RNA?**
    (a) Robert Nuclear Acid
    (b) Retinal Nucleic Sid
    (c) Ribo nucleic acid
    (d) Ribo nuclear acid

79. **The Theory of Evolution was proposed by:**
    (a) Charles Darwin
    (b) Charles Dickens
    (c) Albert Einstein
    (d) Isaac Newton

80. Human belongs to the class Mammalia which does not contain one of the following. Which one is that?
    (a) Rat   (b) Lizard
    (c) Cat   (d) Pig
81. Which of the following circulates impure blood?
    (a) Pulmonary vein   (b) Alveoli
    (c) Pulmonary artery (d) Aorta
82. .... are fleshy tubes that allow to move urine from the kidneys towards the bladder.
    (a) Uterus   (b) Ureter
    (c) Renal pelvis   (d) Bile ducts
83. Which element is essential for the synthesis of thyroxine?
    (a) Manganese   (b) Iodine
    (c) Iron   (d) Zinc
84. Which of the following is not an eye disease?
    (a) Cataract   (b) Dry eye
    (c) Goiter   (d) Glaucoma
85. Small bead-like structures inside the ovary of flowers is called
    (a) Sepals   (b) Stamen
    (c) Ovules   (d) Petals
86. Yeast is used in making_____.
    (a) antibiotics   (b) wine
    (c) cheese   (d) curd
87. Which of the following are the two components of the CPU of a computer ?
    (a) ALU and Bus
    (b) Control unit and ALU
    (c) Control unit and Bus
    (d) Registers and Main memory
88. What is Nomophobia?
    (a) Fear of being out of television contact
    (b) Fear of being out of home contact
    (c) Fear of being out of computer contact
    (d) Fear of being out of cellular phone contact
89. Which of following is in-house software of the Indian Railways to tackle the problem of cattle getting run over by the trains?
    (a) Smart Event Tracking System
    (b) Animal Tracking and Vigilant System
    (c) Indian Railway Tracking System
    (d) Cattle Tracking Collar System
90. What is the address of the cell in the seventh column of the sixth row in an MS-Excel worksheet?
    (a) F7   (b) F6
    (c) G6   (d) G7
91. Who predicted 'nuclear technology is going to be very essential and not just in the power sector but for other societal uses intended for betterment of life?

    (a) JC Bose   (b) Homi J Bhabha
    (c) Sir CV Raman   (d) APJ Abdul Kalam
92. Who became the first Indian female athlete to win two individual Olympic medals?
    (a) Ankita Raina   (b) PV Sindhu
    (c) Dutee Chand   (d) Mirabai Chanu
93. On which day is Gudi Padwa celebrated in the month of Chaitra as per the Hindu calendar?
    (a) First   (b) Fourth
    (c) Second   (d) Fifth
94. Who among the following is popularly known as 'Waterman of India'?
    (a) Dr. Arun Krishnsnan
    (b) Dr. Rajendra Singh
    (c) Dr. Hiralal Chaudhuri
    (d) Dr. MS Swaminathan
95. The total Revenue Curve of a firm shows the relationship between the _____ made by the firm and the output level of the firm.
    (a) Semi-annual revenue (b) Quarterly revenue
    (c) Investment   (d) Total revenue
96. Which of the following is the feature of the Constitution of the United Kingdom?
    (a) Single citizenship
    (b) Fundamental duties
    (c) Concurrent list
    (d) Directive principles of state policy
97. The stars are mainly made up of _____.
    (a) Oxygen and Hydrogen
    (b) Hydrogen and Carbon
    (c) Hydrogen and Helium
    (d) Oxygen and Helium
98. Through which of the following places does the Standard Meridian of India pass?
    (a) Kannauj   (b) Mirzapur
    (c) Agra   (d) Jaunpur
99. 'Amir-al-Khayal' is an Arabic title that is usually translated 'Commander of the Faithful' or 'Leader of the Faithful'. Who among the following was given this designation?
    (a) Muiz-ud-din Bahram
    (b) Jamal-ud-Din Yaqut
    (c) Malik Ikhtiar-ud-din Altunia
    (d) Naseeruddin Mohd.
100. The Treaty of Salbai was signed in ----, which settled the first Anglo-Maratha war?
    (a) June 1782   (b) May 1782
    (c) April 1782   (d) August 1782

SOLUTION : PRACTICE SET- 1

ANSWER KEY

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

SOLUTION

1. (c)
Divisibility rule of 8- If the last three digits of a number are divisible by 8, then the number is completely divisible by 8.
from the given options -
(a) 35 792

$\frac{792}{8} = 99$ (Completely divisible)

(b) 35 112

$\frac{112}{8} = 14$ (Completely divisible)

(c) 35 412

$\frac{412}{8} = 51.5$ (Not completely divisible)

(d) 35 552

$\frac{552}{8} = 69$ (Completely divisible)

Hence, option (c) is not divisible by 8.

2. (c)
Given:-
$1^2 + 2^2 + 3^2 + \ldots\ldots + 12^2$
From, Sum of the square of the first n natural numbers

$= \frac{n(n+1)(2n+1)}{6} = \frac{12 \times 13 \times 25}{6} = 650$

3. (c)
$\Rightarrow -261 + (-380) - (-521) + 821 - (-121)$
$= -261 - 380 + 521 + 821 + 121$
$= -641 + 1463 = 822$

4. (c)
From option,

(a) $\frac{9}{11} = 0.8181$

(b) $\frac{11}{12} = 0.916$

(c) $\frac{8}{13} = 0.615$

(d) $\frac{10}{14} = 0.714$

Hence, it is clear from above that smallest fraction is $\frac{8}{13}$.

5. (c)

Let the required fraction be $\frac{x}{y}$,

And the another fraction is given $= \frac{5}{3}$,

According to the question,

$\frac{x}{y} + \frac{5}{3} = \frac{7}{4}$

$\frac{x}{y} = \frac{7}{4} - \frac{5}{3} = \frac{21-20}{12} = \frac{1}{12}$

Hence, the required fraction is $\frac{1}{12}$.

6. (b)
LCM of (70, 28, 42)

2	70,	28,	42
2	35,	14,	21
3	35,	7,	21
5	35,	7,	7
7	7,	7,	7
	1,	1,	1

Hence LCM of 70, 28 and 42 = 2 × 2 × 3 × 5 × 7
$= 420$

7. (b)
According to the question,
$675 - 270 = 405 = 3 \times 3 \times 3 \times 3 \times 5$

$1215 - 675 = 540 = 2 \times 2 \times 3 \times 3 \times 3 \times 5$

$1215 - 270 = 945 = 3 \times 3 \times 3 \times 5 \times 7$

$HCF = 3 \times 3 \times 3 \times 5 = 135$

So, the required number is 135.

8. (c)
Let share of x = 4a
and share of y = 3a
According to the question
$3a = 2400$
$a = 800$
Hence total initial amount = 7a = 7 × 800
$= ₹ 5600$

9. (a)
Let the population of the city before the war be x.
According to the question,

$$x \times \frac{80}{100} \times \frac{95}{100} = 15200$$

$$x = \frac{15200 \times 100 \times 100}{80 \times 95}$$

$$x = \frac{15200000}{760}$$

x = 20000

10. (c)
Let the two numbers x and y
∴ According to the question,

$$25\% \times x = y \times 30\% + 7$$

$$\frac{25 \times x}{100} = \frac{y \times 30}{100} + 7$$

$$\frac{x}{4} = \frac{3y}{10} + 7$$

$$\frac{x}{4} = \frac{3y + 70}{10}$$

$$5x = 6y + 140$$

5x – 6y = 140 **.......** (1)

Again,
According to the question,

∵ x–y = 29 **........** (2)

From equation (1) and (2) × 5
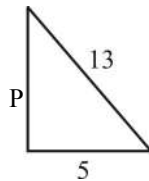
$$5x - 6y = 140$$
$$\underline{5x - 5y = 145}$$
$$y = 5$$

On putting the value of y in equation (2),

x – y = 29
x – 5 = 29
x = 34

Hence the numbers are 34 and 5

11. (c)

From Pythagoras Theorem-

Perpendicular (P) = $\sqrt{(\text{Hypotenuse})^2 - (\text{Base})^2}$

$$= \sqrt{(13)^2 - (5)^2}$$
$$= \sqrt{169 - 25}$$
$$= \sqrt{144}$$
$$= 12 \text{ cm}$$

Area of right-angled triangle $= \frac{1}{2} \times \text{Perpendicular} \times \text{Base}$

$$= \frac{1}{2} \times 12 \times 5$$
$$= 30 \text{cm}^2$$

12. (a)
Suppose the length of rectangular plot is l meter and breadth b meters.

∵ Circumference of rectangular plot $= 2(\ell + b)$

According to the question,

∵ $\ell = b + 5$

∴ $2(\ell + b) = 142$

⇒ $2(b + 5 + b) = 142$

⇒ $(2b + 5) = 71$

⇒ $2b = 71 - 5$

⇒ $2b = 66$

⇒ b = 33m

$\ell = 33 + 5 = 38$m

So length will be 38 meters and breadth will be 33 meters.

13. (c)
From the question,

1 day's work of A $= \frac{1}{15}$ part

1 day's work of B $= \frac{1}{20}$ part

1 day's work of (A + B) $= \left(\frac{1}{20} + \frac{1}{15}\right)$

$$= \frac{7}{60} \text{ part}$$

Hence the time taken by A and B together to do the same work $= \frac{60}{7}$ days

$$= 8\frac{4}{7} \text{ days}$$

14. (c)
Let actual speed = x Km./hr.
Distance = 96 km
New speed = (x–4) Km./hr.
According to the question,

$$\frac{96}{x-4} - \frac{96}{x} = 2$$

$$\frac{48}{x-4} - \frac{48}{x} = 1$$

$$48\left(\frac{1}{x-4} - \frac{1}{x}\right) = 1 \Rightarrow 48\left(\frac{x-x+4}{x(x-4)}\right) = 1$$

$48 \times 4 = x (x–4)$
$x^2 - 4x - 192 = 0$
$x^2 - 16x + 12x - 192 = 0$
$x(x–16) + 12 (x–16) = 0$
$(x+12) (x–16) = 0$
Hence x – 16 = 0
x = 16   x ≠ –12
Actual speed = 16 Km./hr.

15. (c)

Simple interest $= \frac{P \times R \times T}{100}$

$$\therefore 600 = \frac{P \times R \times 10}{100} \Rightarrow PR = 6000$$

According to the question,

Total simple interest = SI_1 for Five years + SI_2 for five years

$$= \frac{5 \times P \times R}{100} + \frac{5 \times 3P \times R}{100} = PR\frac{20}{100}$$

$$= 6000 \times \frac{20}{100} = 1200$$

Total Simple interest = ₹1200

16. (d)
Let Principal = ₹ P

$$\text{Compound Interest} = \left[P\left(1+\frac{R}{100}\right)^t \right] - P$$

$$11700 = \left[P\left(1+\frac{60}{100}\right)^2 \right] - P$$

$$11700 = \left[P\left(\frac{8}{5}\right)^2 \right] - P$$

$$11700 = \frac{64P}{25} - P$$

$$11700 = \frac{64P - 25P}{25}$$

$$P = \frac{11700 \times 25}{39}$$

$$\therefore P = ₹\ 7500$$

17. (c)
Let the cost price of goods (C.P) = ₹100

$$\therefore \text{ Selling price (S.P)} = \frac{100 \times 130}{100} = ₹130$$

Again,
After 25% increase,

$$\text{New C.P} = \frac{100 \times 125}{100}$$
$$= ₹125$$

After increase,

$$\text{New S.P} = \frac{130 \times 110}{100}$$
$$= ₹143$$
$$\text{New Profit} = 143 - 125 = ₹18$$

$$\text{New Profit\%} = \frac{\text{Profit}}{\text{C.P}} \times 100$$
$$= \frac{18}{125} \times 100$$
$$= 14.4\%$$

18. (d)

$$\left(1-\frac{1}{n}\right) + \left(1-\frac{2}{n}\right) + \left(1-\frac{3}{n}\right) + \ldots\text{up to n terms}$$

$$= \left(1+1+1\ldots n \text{ term}\right) - \left(\frac{1}{n} + \frac{2}{n} + \frac{3}{n} \ldots \frac{n}{n}\right)$$

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

Where $\left(\frac{1}{n} + \frac{2}{n} + \frac{3}{n} \ldots \frac{n}{n}\right)$ is A.P.

So, difference $= \frac{2}{n} - \frac{1}{n} = \frac{1}{n}$

We know that,

Sum of n terms in A.P. $(S_n) = \frac{n}{2}\left[2a+(n-1)d\right]$

$$= n - \left[\frac{n}{2}\left\{2 \times \left(\frac{1}{n}\right) + (n-1)\left(\frac{1}{n}\right)\right\}\right]$$

$$= n - \left[\frac{n}{2}\left\{\left(\frac{2}{n}\right) + \left(\frac{n-1}{n}\right)\right\}\right]$$

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

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

$$= \frac{n-1}{2}$$

19. (d)
Given

$$= \sqrt{\frac{1+\sin A}{1-\sin A}}$$

$$= \sqrt{\frac{1+\sin A}{1-\sin A} \times \frac{1+\sin A}{1+\sin A}}$$

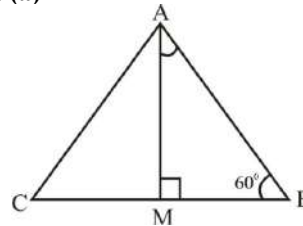$$= \sqrt{\frac{(1+\sin A)^2}{(1-\sin^2 A)}}$$

$$= \sqrt{\frac{(1+\sin A)^2}{\cos^2 A}}$$

$$= \frac{1+\sin A}{\cos A}$$

$$= \frac{1}{\cos A} + \frac{\sin A}{\cos A}$$

$$= \sec A + \tan A$$

20. (a)

According to the question,
Because angle A, B and C are in arithmetic progression
$$A + C = 2B \ ---- (1)$$
$$A + B + C = 180° \ -- \ (2)$$
(On Substituting the value of A + C from equation (1)}
$$2B + B = 180°$$
$$3B = 180°$$
$$B = 60°$$

$$\cos 60° = \frac{BM}{AB} \quad \left(\frac{\text{Base}}{\text{Hypotenuse}}\right)$$

$$\frac{1}{2} = \frac{BM}{AB}$$

21. (a)

Marks (x)	Frequency (f)	fx
50	3	150
28	4	112
85	6	510
40	7	280
	Σf=20	Σfx=1052

$$\text{Mean} = \frac{\sum fx}{\sum f} = \frac{1052}{20} = 52.6$$

22. (b)

$\sqrt{(544)^2 - (256)^2} = ?$

Let ? = x

$\sqrt{(544)^2 - (256)^2} = x$

On Taking both side square.

$(544)^2 - (256)^2 = x^2 \qquad \left[a^2 - b^2 = (a+b)(a-b) \right]$

$800 \times 288 = x^2$

$100 \times 2304 = x^2$

$\boxed{x = 480}$

23. (d)

Let the present age of A = x years

And the present age of B = y years

According to first condition,

$\qquad x + y = 30$ .... (i)

According to second condition,

$\qquad \dfrac{x+5}{y+5} = \dfrac{3}{2}$

$\qquad 2x + 10 = 3y + 15$

$\qquad 2x - 3y = 5$ .... (ii)

from equation (i) × 4 and equation (ii) × 2

$(x + y = 30) \times 4$ .... (iii)

$(2x - 3y = 5) \times 2$ .... (iv)

from equation (iii) and equation (iv)

4x + 4y = 120

4x − 6y = 10

– + – on subtracting

$\overline{10y = 110}$

y = 11

x = 30 − 11

$\quad$ = 19

Hence, the present age of A is 19 years

24. (d)

Number of odd days till 1999 $=$

$400 \times 4 + 300 + 99$ (24 leap year + 75 Normal year)

$= 0 + 1 + 48 + 75 = 124$ Days

$=$ Number of odd days till 1 Nov, 2000 $=$

$3 + 1 + 3 + 2 + 3 + 2 + 3 + 3 + 2 + 3 + 1 = 26$ Days

Total Number of odd days

$= 124 + 26 = \dfrac{150}{7} = 3$ Remainder

$=$ That is, it will be Wednesday on 1 Nov, 2000

$=$ Date of Thursday in November · 2, 9, 16, 23, 30

Hence, it will be Thursday on the 2 and 16 November.

25. (a)

Given that,

Today is Thursday

Now by converting 560 days into weeks and days

$\dfrac{560}{7} = 0$ odd days

∴ the number of odd days = 0

∴ The day after 560 days from today will be Thursday.

26. (a)

Just as, Goods carried by transport. Same as, money is exchanged with a bank. Therefore the bank is related with money.

27. (b)

For a given set of items, most suitable word is 'Technology' because all items are belonged/related to Technology.

28. (a)

Just as,

A		C		E	
↓		↓		↓	
$(1)^2$	+	$(3)^2$	+	$(5)^2$	= 35

And,

A		G		E		D	
↓		↓		↓		↓	
$(1)^2$	+	$(7)^2$	+	$(5)^2$	+	$(4)^2$	= 91

Same as,

C		A		R		E	
↓		↓		↓		↓	
$(3)^2$	+	$(1)^2$	+	$(18)^2$	+	$(5)^2$	= $\boxed{359}$

Hence, CARE = 359

29. (c)

According to the question,
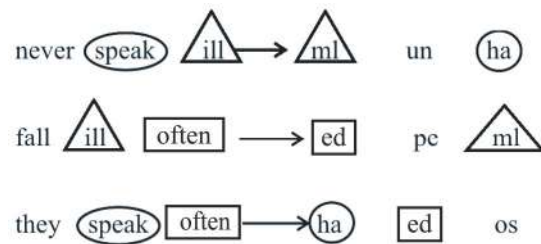
So, the possible code of 'they fall' will be 'pe os'.

30. (b)

Water, Solar and Wind are renewable resources whereas Coal is non-renewable resource.

Hence, option (b) is odd one.

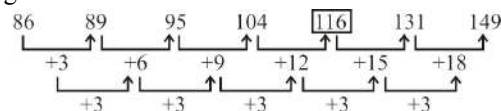**31. (b)**

From options-

(a) $\begin{array}{c} 14 \; : \; 197 \\ \downarrow \qquad \uparrow \\ (14)^2+1 \end{array}$

(b) $\begin{array}{c} 19 \; : \; 363 \\ \downarrow \qquad \uparrow \\ (19)^2+2 \end{array}$ (Odd)

(c) $\begin{array}{c} 17 \; : \; 290 \\ \downarrow \qquad \uparrow \\ (17)^2+1 \end{array}$

(d) $\begin{array}{c} 13 \; : \; 170 \\ \downarrow \qquad \uparrow \\ (13)^2+1 \end{array}$

Hence, option (b) is odd one.

32. (b)

The given series is as follows-

86	89	95	104	$\boxed{116}$	131	149
+3	+6	+9	+12	+15	+18	
+3	+3	+3	+3	+3		

Hence, option (b) is correct.

33. (a)

The series is as follows

$B \xrightarrow{+2} D \xrightarrow{+2} \boxed{F} \xrightarrow{+2} H$

$G \xrightarrow{+2} I \xrightarrow{+2} \boxed{K} \xrightarrow{+2} M$

$L \xrightarrow{+2} N \xrightarrow{+2} \boxed{P} \xrightarrow{+2} R$
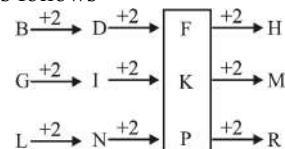
Hence FKP will be in the blank space.

34. (a)
Just as In first triangle

$$=\frac{3^2+3^2}{2}=\frac{18}{2}=9$$

And In second triangle

$$=\frac{3^2+9^2}{2}=\frac{90}{2}=45$$

And In third triangle $=\frac{4^2+6^2}{2}=\frac{52}{2}=26$
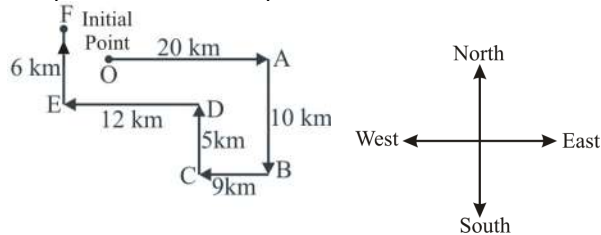
Similarly,
In fourth triangle
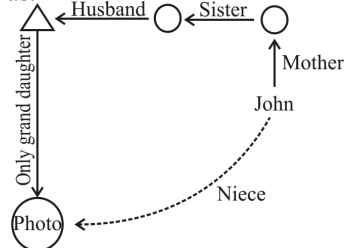
$$=\frac{2^2+2^2}{2}=\frac{8}{2}=4$$

35. (b)
The person's movement path is as follows:

Therefore, It is clear from the diagram that the person is facing towards the North direction.

36. (d)
According to the question, blood relation diagram is follows as:

Hence, it is clear from the blood relation diagram that, the person in the photo is related to John's niece.
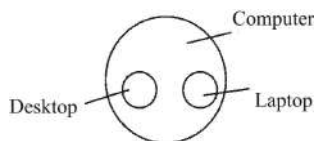
37. (b)
According to the question,
```
      9C5B10A5C12
    = 9 × 5 + 10 – 5 × 12
    = 45 + 10 – 60
    = 55 – 60
    = – 5
```
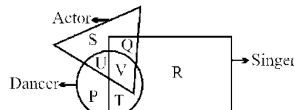
38. (d)
On drawing the Venn diagram according to the question,

Option (d) shows best relationship between Computer, Desktop and Laptops.

39. (a)

T represents dancers who are singers but not actors.
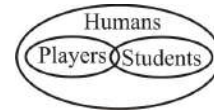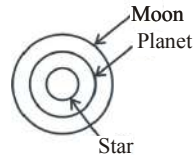
40. (d)
From question,

Figure 2 represents the best relationship between the all classes. Hence, option (d) is correct.

41. (b)
On drawing the Venn diagram as per statement.

Conclusion
1. (✗)   3. (✓)
2. (✓)   4. (✗)
Therefore, conclusion 2 and 3 follow.

42. (c)
It is clear from statement that neither conclusion (I) nor (II) follows.

43. (d)
It is clear from above statement that people want to invest their savings to increases their income. Hence, only assumption 2 in implicit.

44. (b)
From statement 1 and 2
$$P > S > T > R > Q$$
Hence, weight of Q is lightest
Hence, it is clear that both statements are required to obtain answer.

45. (d)
The day of 23/02/2012 = Thursday
Number of days in 1 week = 7

Number of odd days $= \dfrac{91}{7} = (0)$

Then, it will be the Thursday after 91 days from today.

46. (a)
According to the question,

$$\because \qquad M=\frac{2}{11}\left(H\times30\pm\theta\right)$$

$$44=\frac{2}{11}\left(6\times30\pm\theta\right)$$

$$22=\frac{1}{11}\left(180\pm\theta\right)$$

$$242=180\pm\theta$$

$$\theta=242-180$$

$$\theta=62^0$$

47. (d)
Given,
Total number of students = 24
Place of R from left side = 19th
Place of F from left side $= (24-17)+1 = 8^{th}$
Number of students sitting between F and R = $(19-8)-1$
$$= 10$$

48. (b)
Given
$$5X1 + 6Y7 + 3Z3 = 1471$$
For the highest value of X we will take the lowest value of Y and Z.
So take Y = Z = 0
$$5X1 + 607 + 303 = 1471$$
$$5X1 = 1471 - 910 = 561$$
Hence X = 6
So maximum possible value of X = 6

49. (c)
Total number of students =
Right (From start / Top) position + Left (from battom/ last) position – 1
$\Rightarrow$ 30 = R+15–1
$\Rightarrow$ 31 = R + 15
$\Rightarrow$ R = 16
Hence, Renu's rank from top is 16th.

50. (c)
The answer figure A is acquired when the question figure is diagonally folded. So, option (c) is correct.

51. (d)
The amount of radiation being emitted by a radioactive material is measured in Curie. It is the traditional unit of radioactivity and shows the activity of 1g of pure radium and is equal to 3.7×10^{10} disintegration/second. Becquerel is also the SI unit of radioactivity and is defined as the amount of a radioactive substance showing one disintegration/second.

52. (b)
$$K.E. = \frac{1}{2}mv^2$$
$$120 = \frac{1}{2} \times 15 \times v^2 \Rightarrow \qquad v^2 = \frac{120 \times 2}{15}$$
$$\Rightarrow \qquad v^2 = 16 \Rightarrow \qquad v = 4\,ms^{-1}$$

53. (b)
Given-−
$$F = 350\ N,\ m = 500\ kg,\ a = ?$$
According to Newton's second law of motion,
$$F = ma$$
$$\text{Acceleration} = \frac{F}{m}$$
$$= \frac{350}{500} = 0.7 ms^{-2}$$

54. (b)
The buoyancy force is equal to weight of the liquid displaced by an object which is directly proportional to the density of the liquid and volume of the liquid displaced.

55.(a)
Frequency is the number of vibration per second. So, if a wave completes 40 vibration in 2.5 seconds, then the frequency of the wave is
$$f \quad \frac{40}{2.5}Hz \quad 16\,Hz$$

56. (b)
Frequency (n) = 600 Hz
Wavelength (λ) = 3m
Wave velocity (v) = ?
v = n λ (v = Frequency × wavelength)
= 600 × 3 = 1800 ms^{-1}
Thus the speed of the sound wave will be 1800 ms^{-1}.

57. (d)
Sound wave can be described by characteristics : wavelength, amplitude, time-period, frequency and velocity or speed.

58.(a)
The color of the grass appears green to us, because it reflects green light back to our eyes. The refractive index of a substance is different for different colors. When a ray of light collides with some medium and returns to the same medium again, this phenomenon is called reflection of light.

59.(c)
In the absence of atmosphere, there will be no scattering of sunlight at all. In that case, no scattered light will enter into our eyes from the sky and the sky will look black (Dark).

60.(a)
A light ray passing through the optical centre of lens passes without any deviation. Principal focus is the point where the beam parallel to principal axis passes through or appears to pass through that point after passing through lens.

61. (b)
Suppose a ball is placed in front of a concave mirror and a real image that is twice the size of the ball is formed on a screen. The ball and the screen are then moved until the image is five times the size of the object. If the shift of the screen is then the shift in the object is d/10.

62.(d)
In the mirror formula, the focal length of a spherical mirror is-
$$\frac{1}{f} = \frac{1}{v} + \frac{1}{u}$$
$$\frac{1}{f} = \frac{v+u}{vu}$$
$$f = \frac{vu}{v+u}$$

63. (c)
The focal length of a spherical mirror is half of its radius of curvature.

64. (a)
When a beam of light of wave lengths 4500Å and 6000Å respectively passed through a prism then the angle of deviation is more in the light of 4500Å because the colour of light having longer wavelength deviates least when passing through the prism and the colour of light having shorter wave length deviates maximum when passing through the prism.

65. (b)
The apparent position of a star keeps on changing because the refractive index of the different layers of gases changes in the atmosphere due to the change in physical conditions (temperature & pressure) of gases. Change in refractive index in atmospheric gases bents the light rays, coming from the star, many times and this in the reason behind the apparent position change of a star.

66. (c)
Those substances which have fixed size and volume and have high attraction force between particles are called as solids. That is, each solid component consists of particles, these particles are molecules/ atoms.
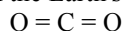
Characteristics-
(1) Solids are incompressible and hard and their constituent particles have less space between them.
(2) They have higher density in comparison to gas and liquid.
(3) The particles of solids are configured in a systematic way and their melting point is often high.

67. (d)
Neutron was discovered in 1932 by James Chadwick by using scattered particle to calculate the mass of the neutral particle. The sub-atomic particle "Neutron" is present in an atom's nucleus.

68. (b)
Carbon dioxide (CO_2) is a gas required for life that is found naturally on Earth. It is about 0.03 percent according to the gas volume in the Earth's atmosphere.
$$O = C = O$$
Carbon dioxide is made up of two atoms of oxygen and one atom of carbon. At normal temperature and pressure, it remains in gaseous state. It is a greenhouse gas. In carbon dioxide, carbon forms a covalent bond by sharing two–two electrons with two oxygen atoms respectively, so the valency of carbon will be 4.

69. (d)
The pH value of that solution will be greater than 7, which turns the red litmus blue.

70.(c)
The rule of octaves was applicable only to the calcium. In 1865–66, an English scientist John Newlands formulated the Octave Rule. According to which, if we decorate the elements in the order of their increasing atomic mass, then starting from an element, exactly the eighth element will have the same properties as the first element. But this law was abandoned after inert gases were discovered.

71.(a)
Li (Lithium) is the first metallic element in the modern periodic table. While hydrogen is the first non-metallic element in this table.

72. (c)
Transition elements are called d-block elements whose two outermost shells are incomplete.

73. (d)
Among the group 16 elements oxygen has the maximum non-metallic character. In this group oxygen and sulphur are classified as non-metals. Selenium (Se) and tellurium are classified as metalloids. In group 16 therefore only Polonium (Po) exhibits metallic characteristics, under standard conditions.

74.(b)
In chemistry and manufacturing, electrical decomposition (electrolysis) is the process by which an electric current is passed into a chemical compound and breaks its chemical bonds. Like- When the electric current flows in water, the water decomposes into 'H_2' and 'O_2'. This is called electrical decomposition of water. Similarly, the most important commercial application is to process the molten metal ore by electrolysis method and to separate the high reacting metal from it.

75. (d)
Carbon dioxide gas is used in the preparation of soda water. This process is known as carbonation and it is a process that causes the water to give effervescence. The amount of the carbon dioxide that can be dissolved in water is given by Henry's Law.

76. (b)
The study of hematology is related to blood. The study of bones is called Osteology.

77. (d)
Adipose tissues are the fat accumulating tissues in human body. Tissues are formed from cells. Adipose tissues are of two types:
1. White adipose tissue (WAT)
2. Brown adipose tissue (BAT)

78. (c)
The complete form of RNA is ribonucleic acid. RNA is a polymeric molecule composed of one or more nucleotides. A nucleotide contains one nitrogenous base, a ribose sugar and a phosphate radical. It contains uracil in place of pyrimidine thiamine.

79. (a)
The theory of evolution was proposed by Charles Darwin. Charles Darwin explained evolution in his book 'The Origin of Species' in English. The theory of evolution is called 'Origin of Species by Natural Selection' or 'Darwinism'.

80.(b)
Mice, cats and pigs (along with human) belong to class Mammalia, while lizards belong to class Reptilia.

81. (c)
The pulmonary artery carries deoxygenated blood from the right ventricle into the lungs for oxygenation. It contains impure blood.The left half of the heart collects and pumps pure (oxygenated) blood from the lungs to all parts of the body.The right half of the heart carries impure (CO_2 containing) blood.The pH value of blood is 7.4.

82. (b)
Each ureter is a muscular tube that drains into the bladder. Smooth muscle contractions in the walls of the ureters, over time, send the urine in small spurts into the bladder.The bladder is a hollow muscular organ shaped like a balloon. The renal pelvis functions as a funnel for urine flowing to the ureter.

83. (b)
Thyroxine is neutral chemical compound. Kidney and liver alongwith their mutual action, converts it into an active compound known as Tri-iodothyronine. Micro nutrients like Iodine and Selenium are responsible for the synthesis of Thyroxine.

84.(c)
Cataract, dry eye and glaucoma are the diseases associated with eye, while goiter caused due to deficiency of iodine.

85. (c)

Ovules are small bead-like structures inside the ovary of the female flowers plant. It develops into a seed when fertilized. Ovules are structures that give rise to and contain the female reproductive cells while stamen are the pollen producing part of a flower, usually with a slender filament supporting the anther.

86. (b)

Yeast is a eukaryotic and single-celled fungus. The commonly used species of yeast is Saccharomyces cerevisiae. It is also known as baker's yeast. It is used in production of fermented products like cakes, bread and alcohol. The organism convert the fermentable sugar present in the substrate into carbon dioxide and ethanol.

87. (b)

CPU (Central Processing Unit) is called the brain of the computer. It performs all types of data processing like operation and storage of data, intermediate results and instructions. It controls the operation of all parts of the computer. CPU has three components - (Control Unit, ALU (Arithmetic Logic Unit) Memory Or Storage Unit).

- An Arithmetic Logic Unit (ALU) is a digital circuit used to perform arithmetic and logic operations.
- The control unit is a component of a computer's Central Processing Unit that directs the operation of the processor.
- Memory is basically a device that has the capacity to store information.

88. (d)

The term NOMOPHOBIA or NO Mobile Phone Phobia is used to describe a psychological condition when people have a fear of being detached from mobile phone connectivity.

89. (a)

Smart Event Tracking System (SETS) is a Google map-based planning and analysis tool and software for Indian railway, developed with the aim to tackle the problem of cattle getting run over by the trains.

90. (c)

In an MS-Excel worksheet address of the seventh column of the sixth row is G6.

91. (b)

The founder of Indian Nuclear Programme, Homi J. Bhabha had envisaged that nuclear technology is going to be very essential and not just in the power sector but for the other societal uses intended for betterment of life.

92. (b)

PV Sindhu is an Indian badminton player. She became first Indian woman who won two consecutive medals in Olympics games, Silver medal in 2016 and Bronze Medal in 2020 Olympics.

93. (a)

As per Hindu calender, the first day of the Chaitra month is celebrated as Gudi Padwa. It marks the traditional new year of Marathi and Konkani Hindus and celebrated in Maharashtra, Goa, Madhya Pradesh and UT's of Dadra Nagar Haveli and Daman Div.

94. (b)

Rajendra Singh is an Indian water conservationist and environmentalist from Alwar district, Rajasthan in India. He is also known as "Waterman of India".

95. (d)

The Total Revenue Curve of a firm shows the relationship between the total revenue made by the firm and the output level of the firm. It refers to the total income of a firm or producer or seller from the sale of total goods and services. Total revenue is also equal to the sum of all the marginal revenues.

Thus TR = P × Q (P = Price, Q = Quantity Sold) or TR = ∑MR

96. (a)

Feature of the Constitution		Source Country
Single citizenship	–	United Kingdom
Fundamental Duties	–	USSR
Concurrent list	–	Australia
Directive principle of state policy	–	Ireland

97. (c)

The stars are mainly made up of Hydrogen and Helium. The gases present in stars are Hydrogen (70%), Helium (28%) and other gases (2.5%). The energy by a shining star is produced by thermonuclear fusion of hydrogen into helium in the stars' core.

98. (b)

The Standard Meridian of India, is declared as 82°30'E that passes through Mirzapur U.P.

The standard meridian of India passes through the following states:
Uttar Pradesh
Madhya Pradesh
Chattisgarh
Odisha
Andhra Pradesh

99. (b)
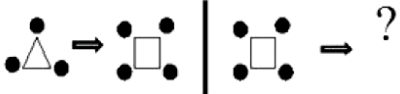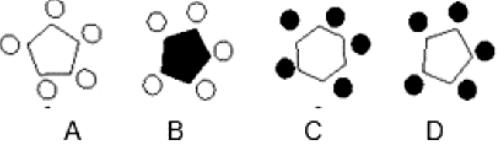
Jamal-ud-Din Yaqut was an African Siddi slave-turned-nobleman who was a close confidant of Razia Sultana. He was an influential member of the court. She awarded him with the honorific title 'Amir-al- Khayal (Amir of Horses)' and later the much higher 'Amir al-Umara (Amir of Amirs)'.

100. (b)

The Treaty of Salbai was signed on 17 May, 1782 by the representatives of Maratha Empire and the East India Company after a long negotiations to settle first Anglo Maratha war, which was started in 1775.

PRACTICE SET - 2

1. If the 15 digit number 4a5124356789734 is divisible by 9, then the value of "a" is ....
   (a) 1   (b) 4
   (c) 5   (d) 3

2. The difference of two numbers is 5. If their product is 336, find the sum of the numbers.
   (a) 21   (b) 37
   (c) 28   (d) 51

3. Find the value of $84 \div 32 \times 8 - 15 \div 8 \times (19 - 35)$
   (a) 38   (b) 45
   (c) 51   (d) 42

4. Find the greatest among these fractions.
   5/6, 6/11, 2/3, 8/9, 6/7
   (a) 2/3   (b) 8/9   (c) 5/6   (d) 6/7

5. What should be added to $5\frac{3}{5}$ to get $8\frac{3}{7}$?
   (a) $\frac{99}{35}$ (b) $\frac{96}{35}$
   (c) $\frac{99}{33}$ (d) $\frac{94}{35}$

6. What is the LCM of $\sqrt[2]{169}, \sqrt[3]{27}, \sqrt[3]{64}$ and $\sqrt[2]{144}$
   (a) 156   (b) 312
   (c) 182   (d) 468

7. Find the greatest possible length that can be used to measure exactly the lengths $3\frac{1}{2}$ m and $8\frac{3}{4}$ m.
   (a) $\frac{11}{4}$ m   (b) $\frac{7}{4}$ m
   (c) $\frac{3}{4}$ m   (d) $\frac{9}{4}$ m

8. If 10% of x = 15% of y, then what will be the value of x : y ?
   (a) 2 : 3   (b) 2 : 1
   (c) 3 : 2   (d) 1 : 2

9. The population of a town is 10,000. If the male population increases by 5% and the female population by 10%, the population will become 10,800. How much of the town's present population is female?
   (a) 7000   (b) 6000
   (c) 8000   (d) 5000

10. If 5% of A + 4% of B = 2/3 (6% of A + 8% of B), then find A : B.
    (a) 1 : 1   (b) 4 : 3
    (c) 1 : 2   (d) 5 : 4

11. The sides of a triangle are 15 cm, 28 cm, and 41 cm. What is the length of its altitude corresponding to the side with a length of 28 cm?
    (a) 14 cm   (b) 10 cm
    (c) 12 cm   (d) 9 cm

12. The sum of the radius of the base and the height of a solid right circular cylinder is 39 cm. Its total surface area is 1716cm^2. What is the Volume (in cm^3) of the cylinder? (Take $\pi = \frac{22}{7}$)
    (a) 4620   (b) 5082
    (c) 4774   (d) 4928

13. X can copy 60 pages in 4 minutes, X and Y together can copy 750 pages in 30 minutes. In how many minutes can 'Y' copy 100 pages?
    (a) 8   (b) 16
    (c) 10   (d) 5

14. Two vehicles from a house moved at a speed of 25 km/h. At an interval of 20 minutes. How much more speed a woman coming from the opposite direction of the house will have to walk so that she gets a vehicle at an interval of 18 minutes.
    (a) 2   (b) $2\frac{5}{9}$
    (c) $2\frac{7}{9}$ (d) $2\frac{8}{9}$

15. Find the simple interest from 5 February 2017 to 19 April 2017 for an amount of ₹5000 at the rate of 6.25% annual interest.
    (a) ₹ 62.50   (b) ₹ 48.50
    (c) ₹ 64   (d) ₹ 80

16. On what sum will the compound interest, at the rate of $12\frac{1}{2}$% per annum for 2 years compounded annually, be ₹6,800?
    (a) ₹27,200   (b) ₹54,400
    (c) ₹27,260   (d) ₹25,600

17. When a bicycle manufacturer reduced the selling price by 50%, the number of bicycles sold radically increased by 700%. Initially, the manufacturer was getting a profit of 140%. What is the new profit percentage?
    (a) 30%   (b) 10%
    (c) 20%   (d) 40%

18. Find the numbers if the arithmetic mean and the geometric mean of the two numbers are 7 and $2\sqrt{10}$ respectively.

(a) 5, 4   (b) 2, 20
(c) 4,10   (d) 8,5

19. Solve the following :

$$\frac{1}{1+\sin\theta}+\frac{1}{1-\sin\theta}= ?$$

(a) 0   (b) $2\cos^2\theta$
(c) $2\sec^2\theta$ (d) 1

20. ABC is an equilateral triangle and O is its circumcentre. If the side of triangle is 6 cm, then the ∠BOC is:
(a) 36°   (b) 60°
(c) 120°   (d) 30°

21. Find the mean of x + 77, x + 7, x + 5, x + 3 and x – 2.
(a) x + 18   (b) x + 8
(c) x – 3   (d) x – 8

22. What is the value of $\sqrt{183184}$?
(a) 414   (b) 432
(c) 428   (d) 416

23. Varun is three times as old as his sister. After six years from now the product of their ages will be 231. Find Varun's present age.
(a) 15 years   (b) 39 years
(c) 13 years   (d) 5 years

24. What day was on 25 January, 1948?
(a) Wednesday   (b) Monday
(c) Friday   (d) Sunday

25. Assuming 8th March 2013 was a Wednesday. What day of the week was 8th March 2014?
(a) Wednesday   (b) Thursday
(c) Tuesday   (d) Monday

26. Which word would best complete the relation given below
Face : Expression :: Hand : ?
(a) Handshake   (b) Indication
(c) Painting   (d) Work

27.

Correct figure which is replace the question mark, that is-

(a) D   (b) B
(c) A   (d) C

28. If DIRTY is written in certain code 24759 and FOAM is written as 1863. ARID will be written as.
(a) 6742   (b) 9165
(c) 1579   (d) 2489

29. In a certain code language,
'find my car' is coded as 'mi co kh',
'black vintage car' is coded as 'co ne ve',
'find black house' is coded as 'ne kh sa',
(Note : All codes are two letter codes only)
What could be the code for 'my vintage house' in the given code language?
(a) ve kh ne   (b) mi ne co
(c) sa mi ve   (d) kh co sa

30. Four words are given, out of which three are alike in some way and one is inconsistent. Select the inconsistent one.
(a) Chair   (b) Desk
(c) Table   (d) Fan

31. Select the odd term from the following.
0.02, 0.020, 2/100, 0.002
(a) 0.002   (b) 0.020
(c) 0.02   (d) 2/100

32. Select the number from among the given options that can replace the question mark (?) and continue the given series.
6, 27, 128, 629, ?
(a) 3131   (b) 2121
(c) 3130   (d) 2120

33. Select the correct option that will complete the given series :
UE_5, TF_4, SG_6, RH_3, ...
(a) QI_4 (b) QI_1
(c) QI_7 (d) QI_8

34. Study the given pattern carefully and select the number that represents the value of x.

| 36	25	16	9	4
361	x	289	256	225

(a) 336   (b) 298
(c) 316   (d) 324

35. X leaves his house facing west, after driving 100 km in same direction, he turns right and again drives 100 km. Then he turns left and drives 50 km. In which direction is X facing in relation to his starting point?
(a) North east   (b) South east
(c) South west   (d) North west

36. Pointing to a person Nayan says, "His only brother is the father of my daughter's father." How is the person related to Nayan?
(a) Father   (b) Grandfather
(c) Uncle   (d) Brother-in-law

37. Consider the following information. P means multiplied, T means subtracted, M means added and B means divided, then the value of-
28 B 7 P 8 T 6 M 4 = ?
(a) 30   (b) 32
(c) 34   (d) None of the above

38. Select the Venn diagram that best represents the relationship between the following classes. Books, Textbooks, Novels, Notebooks

(a)
(b)
(c)
(d)
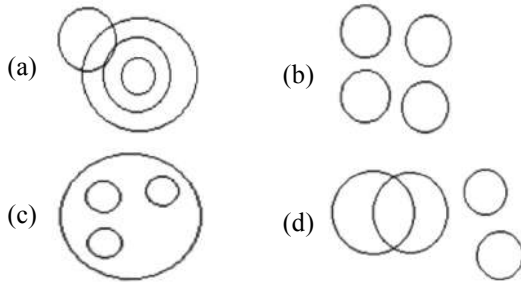
39. In the given figure, the circle denotes the boys, the triangle represents the students, and the rectangle represents the youth, then M represents-
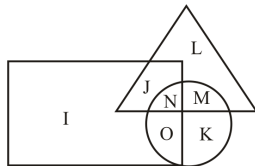
(a) Those students, who are both boys and youth
(b) Those students, who are boys but not youth
(c) Those students, who are only youth
(d) Those students, who are not boys

40. There are three objects X, Y and Z, that have triangular, square and pentagonal shapes, have red, green and blue colours and are made up of different materials gold, silver and bronze such that, X is red but not square. Y is made up of silver but it is not green. X is made up of bronze and Z has a pentagonal shape. What is Z made up of?
(a) Gold   (b) Brass
(c) Bronze   (d) Silver

41. Statements:
1) All buildings are chalk.
2) All boards are chalks.
Conclusions :
I. Some buildings are boards.
II. Some chalks are boards.
(a) Neither conclusion I nor II is appropriate
(b) Both Conclusion I and II are appropriate
(c) Only conclusion I is appropriate
(d) Only conclusion II is appropriate

42. Read the given statements and conclusions carefully and decide which conclusion (s) is/ are implicit from the statement.
Statement:
Human beings and Apes have some common characteristics.
Conclusions:
1. Apes are smarter than human beings.
2. Human beings are smarter than Apes.

(a) Only conclusion 1 is implicit
(b) Neither conclusion 1 nor conclusion 2 is implicit
(c) Only conclusion 2 is implicit
(d) Both conclusion are implicit

43. Consider the given statement and decide which of the given assumptions is/are implicit in the statement.
Statement:
A signboard in a park states: Please use the dustbin, do not litter and help keep your community clean.
Assumptions:
I. Throwing litter around makes a community dirty.
II. People are likely to pay attention to this notice.
(a) Either I or II is implicit.
(b) Only assumption II implicit
(c) Only assumption I implicit
(d) Both, I and II are implicit.

44. Question:
What is the average wage of X, Y and Z?
Statements:
1. Salary of Y is half of (X + Z)
2. X and Y together earn Rs. 40 more than Z and Z earns Rs. 500
(a) Both 1 and 2 are sufficient
(b) Neither 1 nor 2 is sufficient
(c) Only 1 is sufficient while only 2 is insufficient
(d) Only 2 is sufficient while only 1 is insufficient

45. How many odd days are there in 94 years?
(a) 4   (b) 5
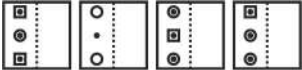(c) 3   (d) 0

46. What is the measure of the smaller of the two angles formed between the hour hand and the minute hand of a clock when it is 5 : 49 p.m.?
(a) 120^0 (b) 119^0
(c) 120.5^0 (d) 119.5^0

47. 8 students Ani, Bini, Cina, Dia, Eva, Fin, Gim and Haz are sitting in a row facing towards North (Not necessarily in the same order). Only four students are sitting between Cina and Bini and one among Cina and Bini is sitting at the end of row. Only three students are sitting between Bini and Ani. Only two students are sitting between Gim and Haz. Dia is sitting to the immediate right of Ani and Ani is fifth to the left of Haz.
Who among the given options could be seated to the immediate left of Bini?
(a) Haz   (b) Gim
(c) Ani   (d) Eva

48. Five children A, B, C, D and E eat mangoes. A eat 8 mangoes less then B. C and E together eat 37 mangoes. D ate 8 mangoes more than C, B eat 5 mangoes more than C, B and A together eat 40 mangoes. Considering the above information which of the following statements is correct.
 (a) D eat 19 mangoes and C eat 27 mangoes
 (b) C eat 11 mangoes and B eat 16 mangoes
 (c) A eat 24 mangoes and B eat 16 mangoes
 (d) E eat 18 mangoes and C eat 19 mangoes

49. Read the given information carefully and answer the question that follows.
Six students P, Q, R, S , T and U are the top six rank holders in a school. The rank of Q is between the Rank of R and S. Rank of Q is fourth. There are two students between the ranks of T and S. Among them the rank of T is the lowest. The rank of U is just above the rank of P. Who, among these ranks is fifth?
 (a) R (b) T
 (c) P (d) S

50. Select the option that depicts the following transparent sheet (Problem Figure) when folded at the dotted line shown.
Problem figure :

Answer Figures :

 (a) C (b) D
 (c) A (d) B

51. The international unit of Speed is-
 (a) m/s (b) km/h
 (c) m/minute (d) km/s

52. An object of 10kg is moving at a speed of 5m/s. what will be the kinetic energy of object?
 (a) 125J (b) 2J
 (c) 25J (d) 50J

53. An object, starting from rest, moves with constant acceleration of 4 m/s². After 8 second, its speed is :
 (a) 16 meters per second
 (b) 8 meters per second
 (c) 32 meters per second
 (d) 4 meters per second

54. Pressure is measured by-
 (a) Mass and density
 (b) Work done
 (c) Force and area
 (d) Force and distance

55. The amplitude of the wave is-
 (a) The distance travelled by the wave over a time period of the wave
 (b) Maximum distance travelled by the particles of the medium on either side from the central state
 (c) Distance travelled by the wave in 1 second
 (d) Distance equal to one wave length

56. Calculate the wavelength of a sound wave that has a frequency of 200 Hz and its speed in a given medium is 400 ms⁻¹.
 (a) 20 m (b) 0.2 m
 (c) 0.5 m (d) 2 m

57. What is a single frequency sound called?
 (a) Note (b) The pitch
 (c) Tone (d) Hertz

58. The theory belongs behind stars twinkling is that-
 (a) The refractive index of the different layers of earth's atmosphere changes continuously, consequently the position of the star's image changes with time.
 (b) The intensity of light emitted by them changes with time
 (c) The light from the star is scattered by the dust particles and air molecules in the earth's atmosphere
 (d) The distance of the stars from the earth changes with time

59. Which of the following solutions may scatter light?
 (a) Acidic solution (b) Colloidal solution
 (c) Basic solution (d) Electrolyte solution

60. An object is placed on the principal axis of a convex lens, at a point beyond $2F_1$. Its image formed is _____.
 (a) real and diminished
 (b) virtual and enlarged
 (c) real and enlarged
 (d) Virtual and diminished

61. The correct relation between v, u and f for a spherical mirror is :
 (a) $\dfrac{1}{f} = \dfrac{1}{v} - \dfrac{1}{u}$ (b) $v = u + f$
 (c) $\dfrac{1}{f} + \dfrac{1}{u} = \dfrac{1}{v}$ (d) $\dfrac{1}{f} = \dfrac{1}{u} + \dfrac{1}{v}$

62. An object is placed at a distance of 10 cm in front of a concave mirror. Its image is formed at a distance at 15 cm on the same side. The focal length of the mirror is :
 (a) 30 cm (b) 6 cm
 (c) −6 cm (d) −30 cm

63. **Which of the following statements is correct with respect to the mirror equation?**
    (a) The center of curvature is equally spaced from the pole and radius of curvature.
    (b) All distances must be measured from the mirror pole.
    (c) All rays will deviate on the pole.
    (d) Pole and focus are at the same point.

64. **The component of white light that deviates the most on passing through a glass prism is:**
    (a) blue   (b) red
    (c) violet   (d) green

65. **Rainbow is formed by .... by drops of water.**
    (a) reflection of light
    (b) refraction of light
    (c) reflection and refraction of light
    (d) diffusion of light

66. **……… is a pure substance?**
    (a) Sugar solution   (b) Methane
    (c) Milk   (d) Air

67. **........... is electrically neutral and weakly micro-atom.**
    (a) neutrino   (b) positron
    (c) electron   (d) proton

68. **Covalently bonded molecules have the low melting points and boiling points because?**
    (a) Intermolecular forces are moderate
    (b) Intermolecular forces are strong
    (c) Intermolecular forces are weak
    (d) Intermolecular forces are very strong

69. **Fill in the blanks with appropriate options.**
    .... turns blue litmus into red and ......, turns ...... litmus to blue
    (a) alkali, acid, red   (b) acid, alkali, green
    (c) alkali, acid, pink   (d) acid, alkali, red

70. **Toothpaste is generally _____ in nature.**
    (a) acidic   (b) harmful
    (c) neutral   (d) basic

71. **Which of the following statements is incorrect?**
    (a) The atomic size increases from top to bottom.
    (b) All elements of the same group have the same valency.
    (c) All isotopes of an element are placed in the same group.
    (d) The atomic radius generally decreases from left to right.

72. **Elements in any common group are similar.**
    (a) atomic size
    (b) Number of valence electrons
    (c) Atomic mass number
    (d) Atomic number

73. **In case of N_2. the molecule has_____.**
    (a) an ionic bond between the two nitrogen atoms
    (b) a double bond between the two nitrogen atoms
    (c) a single bond between the two nitrogen atoms
    (d) a triple bond between the two nitrogen atoms

74. **Teflan is used in cooking equipment in a non-stick coating, used in the electronic industry due to its insulation characteristic in wiring etc., is a polymer containing carbon .... Bonding is involved.**
    (a) chloride   (b) fluoride
    (c) bromide   (d) iodide

75. **Which one of the following substances undergoes sublimation?**
    (a) Iodine   (b) Calcium
    (c) Nitrogen   (d) Sucrose

76. **The study of fertilization, development, division and variation is known as:**
    (a) Embryology   (b) Physiology
    (c) Genetics   (d) Evolution

77. **Blood and bones are examples of ………….. .**
    (a) Connective tissue   (b) Epithelial tissue
    (c) Meristematic tissue (d) Nerve tissue

78. **Some features of genes are mentioned below. Which option states the INCORRECT feature of genes?**
    (a) They do not undergo any change.
    (b) They control traits by producing proteins.
    (c) Each germ cell has one gene set.
    (d) They are segments of DNA.

79. **Carolus Linnaeus is known as:**
    (a) Father of Taxonomy
    (b) Father of Plant
    (c) Father of Atom
    (d) Father of Animal Science

80. **Which of the following animals have two-chambered heart?**
    (a) Birds   (b) Mammals
    (c) Reptiles   (d) Fishes

81. **The arteries carry blood, are filled with:**
    (a) Oxygen   (b) Carbon dioxide
    (c) Toxin   (d) Lipids

82. **In which disease treatment, dialysis is involved?**
    (a) Cancer   (b) Astigmatism
    (c) Renal failure   (d) Arthritis

83. **Human growth hormone is secreted by which gland?**
    (a) Posterior lobe of pituitary gland
    (b) Anterior lobe of pituitary gland
    (c) Thyroid gland
    (d) Pancreas

84. The use of DPT prevents:
   (a) Tuberculosis (b) Diphtheria
   (c) Polio (d) All of the above

85. .... is known as hermaphrodite flower.
   (a) Papaya (b) Watermelon
   (c) Cucumber (d) Mustard

86. Taxol is extracted from which plant?
   (a) Yew (b) Chir
   (c) Chir (d) Neem

87. A microphone converts
   (a) Mechanical energy into sound energy
   (b) Sound energy into mechanical energy
   (c) Electrical energy into sound energy
   (d) Sound energy into electrical energy

88. Which of the following is NOT a computer hardware?
   (a) Software (b) Floppy disk
   (c) CPU (d) Motherboard

89. When a computer virus attaches itself to another computer program, it is known as ——.
   (a) Risky program (b) Trojan horse
   (c) Host program (d) Backward Program

90. In Microsoft Word 2016, to remove paragraph formatting, one must press the shortcut keys _____.
   (a) Ctrl + Y (b) Ctrl + M
   (c) Ctrl + J (d) Ctrl + Q

91. In which country's spacecraft did Rakesh Sharma travel into space?
   (a) Germany (b) Soviet Union
   (c) UK (d) Japan

92. The Winter Olympic Games came into being in
   (a) 1916 (b) 1912
   (c) 1920 (d) 1924

93. Pawl Kut is the greatest of all the festivals celebrated in the state of ....
   (a) Meghalaya (b) Kerala
   (c) Goa (d) Mizoram

94. Which of the following persons played the shehnai at the Red Fort to celebrate the occasion of India's independence in August 1947?
   (a) Ali Ahmed Hussain Khan
   (b) Anant Lal
   (c) Bismillah Khan
   (d) Vasant Desai

95. The inputs used in the production of goods or services to make an economic profit are known as ……….. .
   (a) factors of production
   (b) factors of supply
   (c) factors of presentation
   (d) factors of sales

96. Provision of 'First past the post' in Indian constitution has been adopted from the constitution of
   (a) Ireland (b) France
   (c) Britain (d) USA

97. What is called short burst of energy arising from the sun's photosphere?
   (a) Solar Energy (b) Solar flares
   (c) Sun Stain (d) Solar Wind

98. Name the strait which separates Tamil Nadu of India and Mannar of Sri Lanka.
   (a) Sunda strait (b) Bass strait
   (c) Palk strait (d) Hudson strait

99. Which of the following is the correct sequence of Delhi sultanate?
   (a) Slave → Tughlaq → Khalji → Lodi
   (b) Slave → Khalji → Tughlaq → Lodi
   (c) Slave → Lodi → Khalji → Tughlaq
   (d) Tughlaq → Khalji → Slave → Lodi

100. After the annexation of awadh in 1856, Nawab Wajid Ali Shah was dethroned and exiled to___.
   (a) Meerut (b) Calcutta
   (c) Rangoon (d) Bombay

SOLUTION : PRACTICE SET- 2

ANSWER KEY

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

SOLUTION

1. (b)
Divisibility rule of 9 - If the sum of the digits are divisible by 9, then the number is divisible by 9.
Number - 4a5124356789734
On divided by 9 -
$$\frac{4+a+5+1+2+4+3+5+6+7+8+9+7+3+4}{9}$$
$= \frac{a+68}{9} \Rightarrow$ On putting a = 4 $\Rightarrow \frac{4+68}{9} = \frac{72}{9} = 8$
Hence the value of a = 4

2. (b)
Let the numbers be x and y respectively.
$$x - y = 5 \qquad (i)$$
$$xy = 336 \qquad (ii)$$
$$(x + y)^2 = (x–y)^2 + 4xy$$
From equation (i) and (ii),
$$(x + y)^2 = (5)^2 + 4 \times 336$$
$$(x + y)^2 = 25 + 1344$$
$$(x + y)^2 = 1369$$
$$(x + y) = \sqrt{1369}$$
$$x + y = 37$$
Hence, the required sum of the numbers =37

3. (c)
$84 \div 32 \times 8 - 15 \div 8 \times (19 - 35)$
$= 84 \div 32 \times 8 - 15 \div 8 \times (-16)$
$= \frac{84}{32} \times 8 - \frac{15}{8} \times (-16)$
$= 21 + 30 = 51$

4. (b)
From question :-
$\frac{5}{6} = 0.83$, $\frac{6}{11} = 0.54$
$\frac{2}{3} = 0.67$, $\frac{8}{9} = 0.89$
$\frac{6}{7} = 0.85$
Hence, the greatest fraction is $0.89 = \frac{8}{9}$

5. (a)
Let the required number be x.
According to the question,
$$5\frac{3}{5} + x = 8\frac{3}{7}$$
$$x = 8\frac{3}{7} - 5\frac{3}{5} = \frac{59}{7} - \frac{28}{5}$$
$$= \frac{295 - 196}{35} = \frac{99}{35}$$
Hence, the required number is $\frac{99}{35}$

6. (a)
From question,
$$\sqrt[2]{169} = 13, \sqrt[3]{27} = 3, \sqrt[3]{64} = 4, \sqrt[2]{144} = 12$$

2	13,	3,	4,	12
2	13,	3,	2,	6
3	13,	3,	1,	3
13	13,	1,	1,	1
	1,	1,	1,	1

Hence, LCM = 2 × 2 × 3 × 13
= 156

7. (b)
HCF of $3\frac{1}{2}$ and $8\frac{3}{4} = \frac{\text{HCF of numerator}}{\text{LCM of denominator}}$
HCF of $\frac{7}{2}$ and $\frac{35}{4} = \frac{\text{HCF of 7, 35}}{\text{LCM of 2,4}} = \frac{7}{4}$
Hence, greatest possible length $= \frac{7}{4}$ m

8. (c)
$$x \times \frac{10}{100} = y \times \frac{15}{100}$$
$$10x = 15y$$
$$\frac{x}{y} = \frac{15}{10}$$
$$\frac{x}{y} = \frac{3}{2}$$
or $\qquad$ x : y = 3 : 2

9. (b)
Let, the number of males $= x$
And the number of females $= (10, 000 - x)$
According to the question-
105% of x + 110% of (10, 000 - x) = 10800

$$x \times \frac{105}{100} + (10,000 - x) \times \frac{110}{100} = 10800$$

$$\frac{21}{20}x + (10,000 - x) \times \frac{22}{20} = 10800$$

$$21x + 220000 - 22x = 10800 \times 20$$
$$22x - 21x = 220000 - 216000$$
$$x = 4000$$

Hence, the present number of females
$$= (10,000 - 4000)$$
$$= 6000$$

10. (b)
Given,
5% of A + 4% of B = 2/3 (6% of A + 8% of B)

$$\frac{A \times 5}{100} + \frac{B \times 4}{100} = \frac{2}{3}\left(\frac{6 \times A}{100} + \frac{8 \times B}{100}\right)$$

$$\frac{5A}{100} - \frac{12A}{300} = \frac{16B}{300} - \frac{4B}{100}$$

$$\frac{3A}{300} = \frac{4B}{300}$$

$$3A = 4B$$

$$\frac{A}{B} = \frac{4}{3}, \quad A : B = 4 : 3$$

11. (d)
Sides of triangle = 15 cm, 28 cm and 41 cm

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

$$S = \frac{15+28+41}{2} = \frac{84}{2} = 42 \text{ cm}$$

Area of triangle $= \sqrt{42(42-15)(42-28)(42-41)}$
$$= \sqrt{42 \times 27 \times 14 \times 1} = 126 \text{ cm}^2$$

∴ length of altitude = 28 cm

$$\text{Area} = \frac{1}{2} \times \text{Base} \times \text{Height}$$

$$126 = \frac{1}{2} \times 28 \times \text{altitude}$$

Thus, altitude = 9 cm

12. (d)
Let the radius and height of the cylinder is R and H respectively.
According to the question,
Total surface area of cylinder = 1716
$$2\pi R(H+R) = 1716 \qquad (\because H+R = 39\text{cm})$$

$$2 \times \frac{22}{7} \times R \times 39 = 1716$$

$$R = \frac{1716 \times 7}{39 \times 2 \times 22}$$

$$R = 7 \text{ cm}$$

Volume of cylinder $= \pi R^2 H$

$$= \frac{22}{7} \times 7 \times 7 \times 32 \qquad [H = 39 - 7 = 32]$$

$$= 4928 \text{ cm}^3$$

13. (c)

$$\text{1 minute work of X} = \frac{60}{4} = 15 \text{ pages}$$

$$\text{1 minute work of X and Y} = \frac{750}{30} = 25 \text{ pages}$$

∴ One minute work of Y = 25 − 15 = 10 pages
∴ Time taken by Y to copy 100 pages

$$= \frac{100}{10} = 10 \text{ minutes}$$

14. (c)
Distance covered by vehicle in 20 minutes
Distance = Speed × Time

$$= 25 \times \frac{20}{60} \text{ km.}$$

$$= 25 \times \frac{1}{3} = \frac{25}{3} \text{ km.}$$

Let the speed of woman = x Km./hr.
∴ From question,

$$\frac{\frac{25}{3}}{25+x} = \frac{18}{60}$$

$$\Rightarrow \quad \frac{25}{3(25+x)} = \frac{18}{60}$$

$$\Rightarrow \quad \frac{25}{75+3x} = \frac{18}{60}$$

$$\Rightarrow \quad \frac{25}{75+3x} = \frac{3}{10}$$

$$\Rightarrow \quad 250 - 225 = 9x$$

$$\Rightarrow \quad 25 = 9x$$

$$\Rightarrow \quad x = \frac{25}{9}$$

Hence speed of woman $= 2\frac{7}{9}$ Km./hr.

15. (a)
Rate = 6.25%, Amount = ₹ 5000
Number of days from 5 February 2017 to 19 April

$$2017 = 73 \text{ Days} = \frac{73}{365} \text{ Years}$$

$$\text{Simple interest} = \frac{5000 \times 6.25 \times 73}{100 \times 365}$$

$$= \frac{50 \times 625 \times 73}{100 \times 365}$$

$$= \frac{1 \times 125 \times 73}{2 \times 73} = ₹ 62.5$$

16. (d)
Let the principal is x Rs.
Given-

$$\text{Rate (r)} = 12\frac{1}{2}\% = \frac{25}{2}\%$$

Time (t) = 2 years
Compound interest (CI) = ₹ 6800
∴ CI = A - P

$$6800 = x\left[\left(1+\frac{25}{200}\right)^2 - 1\right]$$

$$6800 = x\left[\frac{9}{8}\times\frac{9}{8} - 1\right]$$

$$6800 = x\left[\frac{81}{64} - 1\right]$$

$$6800 = \frac{17x}{64}$$

$$x = \frac{6800\times64}{17}$$

$$x = ₹\ 25600$$

17. (c)
Let the cost price of 1 bicycle = ₹ 100

Initial profit = 140% of 100

$$= \frac{140}{100}\times100$$

$$= ₹\ 140$$

∴ Selling price = CP + Profit

$$= 100 + 140$$

$$= ₹\ 240$$

New, selling price = 50% of 240

$$= 240\times\frac{50}{100}$$

$$= ₹\ 120$$

Number of bicycle sold after increase = 1 + 700%

$$= 1 + \frac{700}{100}$$

$$= 8\ units$$

∴ Net SP = 120 × 8 = 960

Net CP = 100 × 8 = 800

New profit% = $\frac{960-800}{800}\times100 = 20\%$

18. (c)
Let two numbers be a and b.

Arithmetic mean of both numbers $= \frac{a+b}{2}$

Geometric mean $= \sqrt{ab}$

According to the question,

$$\frac{a+b}{2} = 7$$

$$a + b = 14\ ....(i)$$

and $\quad \sqrt{ab} = 2\sqrt{10}$

$$ab = 40\ ...(ii)$$

On solving equation (i) and (ii),

$$a + \frac{40}{a} = 14$$

$$\frac{a^2 + 40}{a} = 14$$

$$a^2 + 40 = 14a$$

$$a^2 - 14a + 40 = 0$$

$$a^2 - 10a - 4a + 40 = 0$$

$$a(a-10) - 4(a-10) = 0$$

$$(a-10)(a-4) = 0$$

a = 10 or 4

a = 10

b = 4

Hence the numbers are 4 and 10.

19. (c)
Given that,

$$\frac{1}{1+\sin\theta} + \frac{1}{1-\sin\theta} = \frac{1-\sin\theta+1+\sin\theta}{1-\sin^2\theta}$$

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

$$= \frac{2}{\cos^2\theta} = 2\ sec^2\theta$$

20. (c)
According to the question,
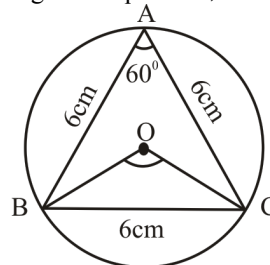
∵ Each angle in equilateral triangle is 60º.

∵ We know that, the angle subtended by an arc of a circle on the circumference of a circle is half of the angle subtended at the centre.

∵ ∠BOC = 2×∠BAC

∠BOC = 2×60°

∴ ∠BOC = 120°

21. (a)
We know that,

$$Mean = \frac{Sum\ of\ terms}{No.\ of\ terms}$$

$$= \frac{(x-2)+(x+3)+(x+5)+(x+7)+(x+77)}{5}$$

$$= \frac{5x+90}{5}$$

$$= \frac{5(x+18)}{5} = (x+18)$$

22. (c)
$\sqrt{183184}$ = The square root of 183184.

So finding the square root of 183184,

			4	2	8		
	4	1	8	3	1	8	4
	+ 4	1	6				
	8 2	×	2	3	1		
+	2		1	6	4		
8 4 8			6	7	8	4	
	8		6	7	8	4	
			×	×	×	×	

Hence, the required value is 428.

23. (a)
Let- Present age of Varun's sister = x years
And Varun's present age = 3x years
After 6 years,
Varun's sister age = (x + 6)
And Varun's age = (3x + 6)
According to the question-
$$(x + 6)(3x + 6) = 231$$
$$3x^2 + 6x + 18x + 36 = 231$$
$$3x^2 + 24x - 195 = 0$$
$$x^2 + 8x - 65 = 0$$
$$x^2 + 13x - 5x - 65 = 0$$
$$x(x + 13) - 5(x + 13) = 0$$
$$(x + 13)(x - 5) = 0$$
$$x = -13, 5$$
Hence, present age of Varun = 3x = 3×5 = 15 years
24. (d)
According to the question,
Total odd days till 1948 = 1900 + 47 (36 normal year
and 11 leap year) + $\frac{25}{7}$ Odd day (4)
$$= 1 + 36 \times 1 + 11 \times 2 + 4$$
$$\Rightarrow \frac{63}{7} = 0 \text{ Remainder} \Rightarrow \text{Sunday}$$
Hence, it was Sunday on 25 January, 1948.
25. (b)
Given,
8th March 2013 → Wednesday
∵ 2014 is an ordinary year, so 8th March 2014 will be
one day ahead of 8th March 2013
Hence, 8th March 2014 = Wednesday + 1 = Thursday.
26. (b)
Just as, expression is related to face. Same as, indication
is related to hand.
27. (a)
Figure D will replace the question picture. So option (a)
is correct.
28. (a)
Such as,   and,
D I R T Y   F O A M
↓ ↓ ↓ ↓ ↓   ↓ ↓ ↓ ↓
2 4 7 5 9   1 8 6 3
Similarly,
A   R   I   D
↓   ↓   ↓   ↓
6   7   4   2
29. (c)
According to the question,

Hence, 'my vintage house' is coded as 'sa mi ve'.

30. (d)
Chair, Desk and Table are furniture related items,
whereas a fan is an electronic item.
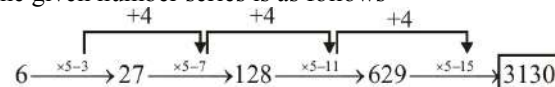So the fan is different from the other three.
31. (a)
In the given terms,
$$0.02, 0.020, \frac{2}{100} = 0.02$$
The value of the first three terms is same but the fourth
term is $\frac{1}{10}$ times of all others. Hence, the term 0.002 is
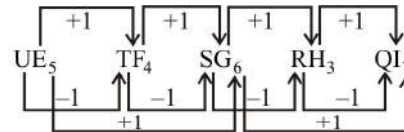inconsistent.
32. (c)
The given number series is as follows-

Hence, ? = 3130.
33. (c)
The series is as follows

Hence $\boxed{? = QI_7}$
34. (d)
Just as,
36,   25,   16,   9,   4
↑   ↑   ↑   ↑   ↑
6^2, 5^2, 4^2, 3^2, 2^2
Similarly,
361, 324, 289, 256, 225
↑   ↑   ↑   ↑   ↑
19^2, 18^2, 17^2, 16^2, 15^2
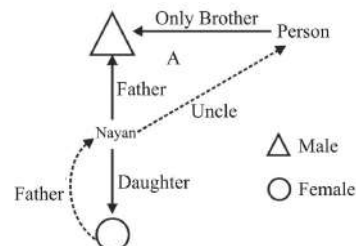Hence, x = 324.
35. (d)
According to the question,
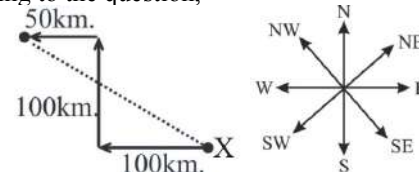
Therefore, the direction of X is in North-West direction
related to his initial point.
36. (c)
According to the question the blood relation diagram is
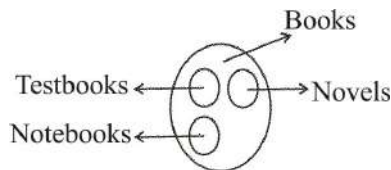as follows:

Hence, the person is Nayan's uncle.

37. (a)
Given,

$P \rightarrow \times, \quad T \rightarrow -, \quad M \rightarrow +, \quad B \rightarrow \div$

According to the question,

$= 28 \div 7 \times 8 - 6 + 4$
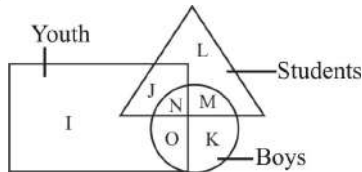$= 4 \times 8 - 2$
$= 32 - 2 = 30$

38. (c)
Suitable Venn diagram for Books, Textbooks, Novels and Notebooks–

Hence, option (c) is correct.

39. (b)

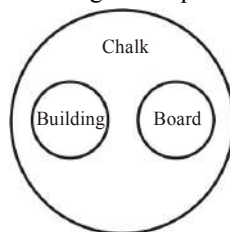M represents those students who are boys but not youth.

40. (a)

Object	Material	Colour	Shape
X	Bronze	Red	Triangular
Y	Silver	Blue	Square
Z	Gold	Green	Pentagonal

Hence, Z is made up of gold.

41. (d)
On drawing the Venn diagram as per statement.

It is clear from the Venn-diagram that only conclusion II is logically appropriate.

42. (b)
According to the given statement it is clear that neither conclusion 1 nor conclusion 2 is implicit.

43. (d)
Both I and II are implicit. Because on throwing litter around makes a community dirty. By writing on the notice board it means that people are likely to pay attention to this notice.

44. (d)
From statement 1,

$y = \dfrac{x + z}{2}$
$2y = x + z$

Average wages cannot be known because of any value of X, Y and Z are not given.

From statement 2 $\qquad x + y = z + 40$

and $\qquad z = 500$

$x + y = 540$

$\therefore \quad$ required average $= \dfrac{x + y + z}{3}$

$= \dfrac{540 + 500}{3} = 346.66$

Hence, it is clear that to answer the question statement 2 is sufficient where as statement 1 is insufficient.

45. (b)
Odd day in 94 years −

Total leap years $= 23$
Normal year $= 94 - 23 = 71$
Total odd days $= 23 \times 2 + 71 \times 1$
$= 46 + 71 = 117$
$= \dfrac{117}{7} = 5$ odd days

46. (d)
According to the question,

From, minute $= \dfrac{2}{11}$ [hour $\times 30 \pm$ angle]

$\therefore \qquad 49 = \dfrac{2}{11}[5 \times 30 + \theta]$

$\Rightarrow \qquad \dfrac{49 \times 11}{2} = 150 + \theta$

$\Rightarrow \qquad 269.5 - 150 = \theta$

$\Rightarrow \qquad \theta = 119.5$

Hence, intended angle $= 119.5°$

47. (d)
According to the question,
The sitting arrangement is as follows :

Cina Ani Dia Gim Eva/Fin Bini Haz Eva/Fin

In the above sitting arrangement, it is clear that Eva or Fin is sitting to the left of Bini.

Since, 'Fin' is not named in the options. So, Eva could be seated to the immediate left of Bini.

48. (d)
Let the mango eat by C $= x$
then $\quad$ B $= x + 5$, A $= x - 3$, D $= x + 8$
$\because \qquad$ A + B $= 40$
$x - 3 + x + 5 = 40$
$2x = 38$
$\boxed{x = 19}$
$\because \qquad$ C + E $= 37$
$19 + E = 37$
$E = 37 - 19$
$\boxed{E = 18}$

Hence, the statement 'E eat 18 mangoes and C eat 19 mangoes' is right.

49. (a)
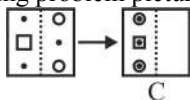According to the question,

Student	Rank
U	1st
P	2nd
S	3rd
Q	4th
R	5th
T	6th

Hence, it is clear that the rank of R is fifth in six students.

50. (a)
On folding problem picture,

So, option (a) is true.

51. (a)
Speed is defined as the distance covered in unit time
$$\Rightarrow \text{Speed} = \frac{\text{Distance}}{\text{Time}}$$
Its SI unit is metre/sec.

52. (a)
Kinetic energy is directly proportional to the mass of the object and to the square of its velocity.
$$\text{K.E.} = \frac{1}{2}mv^2$$
here, m = 10 kg, v = 5 m/s

Kinetic energy $= \frac{1}{2} \times 10 \times (5)^2 = 5 \times 25 = 125$ Joule

53.(c)
From the first law of motion-
$$v = u + at$$
$$v = 0 + 4 \times 8 \quad \left\{ \begin{array}{l} \because u = 0 \\ a = 4m/s^2 \\ t = 8\sec \end{array} \right\}$$
$$v = 32 m/s$$

54. (c)
Pressure is measured by force and area.
$$\text{Pressure} = \frac{\text{Force}}{\text{Area}}$$
$\Rightarrow$ The unit of Pressure is Pascal (N/m^2).

55.(b)
The amplitude of the wave is the maximum distance travelled by the particles of the medium on either side from the central space (up or down).

56. (d)
Frequency $(n) = 200\,\text{Hz}$

Velocity $(V) = 400\,\text{m}/\text{s}$,

Wavelength $(\lambda) = ?$

$\because\quad V = n\lambda$

$\therefore\quad \lambda = \dfrac{V}{n} = \dfrac{400}{200} = 2\,\text{m}$

Hence the wavelength of sound wave (λ) = 2 meters.

57. (c)
A sound produced due to single frequency is called tone and sound that is produced due to a mixture of several frequencies is called a note.

58. (a)
The theory belongs the twinkling of stars is that the refractive index of the various layers of the Earth's atmosphere changes continuously, consequently the position of the image of the star changes with time.

59. (b)
The scattering of light by colloidal particle present in colloidal solution that makes the entering light visible is called the tyndall effect.

60.(a)
When an object is placed on the principal axis of a convex lens, at a point beyond $2F_1$ then the image formed by it, is real and diminished.

61.(d)
The correct relation between v, u, and f for a spherical mirror is $\dfrac{1}{f} = \dfrac{1}{u} + \dfrac{1}{v}$

62. (c)
Given,
object distance = u = –15 cm
image distance = v = – 10 cm
We know that,
Mirror formula,
$$\frac{1}{f} = \frac{1}{v} + \frac{1}{u}$$
$$f = \frac{vu}{v+u} = \frac{(-15)(-10)}{-25}$$
f = –6 cm.

63.(b)
Mirror equation,
$$\frac{1}{f} = \frac{1}{u} + \frac{1}{v}.$$
All the distances i.e. u, v and f are measured from the pole of the mirror. This statement is correct.

64. (c)
The light which has highest wavelength will deviate less and will have less dispersion when it passes through a prism. Each beam of light with its own particular wavelength (or colour) is delayed differently by glass. As violet light has a shorter wavelength it is delayed more than longer wavelengths of red light. Consequently violet light is bent most while red light in bent the least.

65.(c)
Rainbow is form by dispersion of sunlight by tiny water droplets, suspended in the atmosphere after a rainfall.
Three phenomena of light are responsible for the formation of rainbow in the sky.
(i)   Refraction
(ii) Dispersion
(iii) Total internal reflection of light

66. (b)
Methane is a pure substance. It is found in the form of natural gas along with petroleum substances under the surface of the earth. It is also found in marshy lands, hence it is also called marsh gas.

67. (a)
The neutrino is electrically neutral and weakly micro-atom. Neutrino is a new particle, first discovered by Pauli in 1930 AD. The first theoretical basis of this particle was given by the famous physicist Fermi in 1934. Neutron was discovered by James Chadwick.

68. (c)
The melting and boiling points of covalent compounds are low due to weak attraction forces between molecules. Less energy is required to break this attraction force.

69.(d)
The litmus paper is actually blue. But when it is immersed in acid, it turns red and this red litmus paper is again dipped in alkaline solution, then it turns red to blue. Due to this nature of litmus paper it is also called indicator.

70. (d)
Toothpaste is generally basic in nature. Bacteria in our mouth releases acids by action on the leftover food in our mouth so as to neutralize the acid toothpaste has to be base.
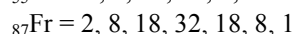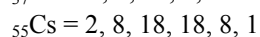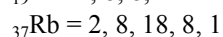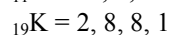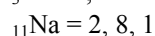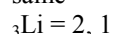
71. (c)
In the modern long-term periodic table –
The size of atoms of elements increases from top to bottom in a group while the valence of elements remains the same when moving from top to bottom in a groups. For example, all the elements of groups IA have the same valency. Similarly, the size of the atomic radius of elements decreases when moving from left to right in a period. Hence option (c) is wrong.

72. (b)
The number of valence electrons in the same group of elements present in the modern long-term periodic table is the same.
For example, the number of valence electrons of all the elements present in groups I-A (s-block element) is the same-
$_3Li = 2, 1$
$_{11}Na = 2, 8, 1$
$_{19}K = 2, 8, 8, 1$
$_{37}Rb = 2, 8, 18, 8, 1$
$_{55}Cs = 2, 8, 18, 18, 8, 1$
$_{87}Fr = 2, 8, 18, 32, 18, 8, 1$
Thus, here the number of electrons in the outer cell of all elements which are known as valence electron is equally one (1).

73. (d)
In case of N_2. the molecule is connected with triple bond.
$$\ddot{N} \equiv \ddot{N}$$
The structure of N_2 is also shown as Lewis structure.

74. (b)
Teflan is used in cooking equipment in a non-stick coating. It is a polymer it does not have the effect of heat, acid and alkali and it is a bad conductor of electric current. Which involves carbon fluoride bonding.

75. (a)
Sublimation is the transition of a substance directly from the solid to the gaseous state without passing through the intermediate liquid state. For example camphor, iodine, Naphthalene etc.

76. (a)
Embryology is the branch of biology that deals with prenatal development of gametes (sex cells), fertilization, and development of embryos and fetuses. Physiology is a biological science that deals with the functions and activities of life or of living matter (such as organs, tissues, or cells) and of the physical and chemical phenomena involved. Genetics is the branch of biology concerned with the study of genes, genetic variations and heredity in organisms.

77. (a)
Such groups of cells in body that have similar structure, and function together are called tissues. Cells combine to form tissue. Blood and bones are examples of 'connective tissue'. The tissue covering the body of the animal or providing external defense is called 'Epithelial Tissue'. The brain, spinalcord and nerve are all made up of nervous tissue.

78. (a)
Genes are functional units of heredity as they are made of DNA. Each gene carries instructions that determine the feature of any species, such as eye colour, hair colour etc. Genes can also undergo change due to mutation.

79. (a)
The system of classification that Carl Linnaeus introduced, laid foundation of modern classification system, hence he is called the Father of Modern Classification. In 1753 AD, he introduced the binomial nomenclature system of organisms.

80. (d)
The fishes have two chambered heart. One chamber is atrium and another chamber is ventricle.
While birds and mammals have 4-chambered heart i.e. two chambers of atrium and two of ventricles.

81. (a)
The arteries carry pure blood, which is filled with oxygen (except pulmonary artery). Arteries are the blood vessels of the body that carry blood away from the heart and to the organs and tissues of the body while veins carry deoxygenated blood from the tissues back to the heart; exceptions are the pulmonary and umbilical veins, both of which carry oxygenated blood to the heart.

82. (c)
Uremia is a major symptom of renal failure.It is a dangerous condition that occurs when the kidneys no longer filter properly. Dialysis is the main treatment option for uremia. Dialysis is the process in which the removal of wastes, extra fluids, and toxins from bloodstream is handled artificially instead of by kidneys through Hemodialysis. Hemodialysis is a procedure where a dialysis machine and a special filter called an artificial kidney, or a dialyzer, are used to clean blood. This process is boon for uremic patients in the world.

83.(b)
Pituitary gland is an endocrine gland, which secretes pituitary hormones. It is divided into two parts adenohypophysis and neurohypophysis. Adenohypophysis is composed of pars distalis and pars intermedia. The pars distalis is also known as the anterior pituitary gland which secrets growth hormone and hormones like somatotropin, prolactin etc.

84.(b)

The use of DPT prevents diphtheria.

Diphtheria - Diphtheria is a serious infection caused by strains of bacteria called Corynebacterium diphtheria that make a toxin. Due to this disease, a membrane is formed in the throat and breathing becomes blocked. It is contagious disease. Diphtheria bacteria usually spread from person to person through respiratory droplets, like from coughing or sneezing.

Treatment - Infectious diseases like diphtheria, pertussis and tetanus can be prevented by DPT triplet viral vaccine.

85.(d)

Mustard is hermaphrodite flower. Some plants are hermaphrodites. In their reproductive organs, flowers, there are both male and female reproductive systems. The pollen, or male gamete is released from a stamen. The female part, stigma, is a long tube that leads to ovules containing eggs. The pollen must make its way from the stamen to the stigma.

86. (a)

Taxol is mainly extracted from Yew tree. It is mainly found in mountainous regions of Northern hemisphere. In India, it is mainly found in Himalayan regions. Taxol is an anti-cancer drug, and used in lung breast & ovarian cancer and Kaposi's sarcoma.

87. (d)

Mechanical energy to Sound energy -Sitar

Electric energy to sound energy -Loudspeaker

Sound energy to electric energy - Microphone

88. (a)

Floppy disk, CPU & Motherboard is computer hardware while software is computer software.

89. (b)

A Trojan horse, or Trojan, is a type of malicious code or software that looks legitimate but can take control of your computer. A Trojan is designed to damage, disrupt, steal, or in general inflict some other harmful action on your data or network.

90. (d)

Ctrl + Q short key is used to delete paragraph formatting in Microsoft Word 2016. Ctrl + Y is used to Redo and Ctrl + Z is used to undo.

91. (b)

Indian Air force pilot Rakesh Sharma in 1984 created history by making journey to space, being the first Indian to do so. Rakesh Sharma was the member of Soyuz T-11 mission of USSR and was launched on 2nd April, 1984. He spent nearly 8 days encircling the earth

92. (d)

The first Winter Olympic Games were held in 1924 in Chamonix, France, but they were originally called "Winter sports week".

93. (d)

Pawl Kut is the greatest of all the festivals celebrated in the state of Mizoram. Once all the harvests are over, this harvest festival is celebrated with great fun. The festival is usually celebrated either in the month of December or January.

94. (c)

Bismillah Khan played the Shehnai on 15th August 1947 at the Red fort to celebrate the occasion of India's independence.

95. (a)

The inputs used in the production of goods and services to make an economic profit are known as factors of production. Factors of production are inputs used in the production of goods or services to make an economic profit. These include any resource needed for the production or creation of a goods or service. The factors of production are land, labour, capital and entrepreneurship.

96. (c)

The 'first past the post' system is also known as the simple majority system, wherein voters cast their votes for a single candidate and the candidate with the most votes wins the election. This system has been borrowed from the British constitution.

97. (b)

The Solar flares are a sudden explosion of energy caused by tangling crossing or reorganizing of magnetic field lines near sun spots. Solar flares release a lot of radiation into space. Sunspots are the areas that appear dark on the surface of the sun. They appear dark because they are cooler than other parts of the Sun's surface. the temperature of a sunspot is still very hot around 6.500 degree Fahrenheit.

98. (c)

Strait	Geographical Location
Palk Strait	India & Sri Lanka
Sunda Strait	Sumatra & Java Islands
Bass Strait	Tasman Sea & South Sea
Hudson Strait	Bay of Hudson & Atlantic Ocean

99. (b)

The period between 1206 A.D. and 1526 A.D. in Indian history is known as the Delhi sultanate period. The Delhi Sultanate is said to be the reign of the Sultans of the five dynasties that ruled India. In Delhi Sultanate, four dynasties were originally Turks while the last Lodhi dynasty was Afghan. The rule of Sultans of Delhi Sultanate sequentially-

The Slave Dynasty (1206–1290 AD)

The Khalji Dynasty (1290-1320 AD)

The Tughlaq Dynasty (1320-1414 AD)

The Sayyid Dynasty (1414-1451 AD)

The Lodi Dynasty (1451-1526 AD)

100. (b)

In 1856, Nawab Wajid Ali Shah was dethroned and exiled to Calcutta on the plea that the region was being misgoverned. The Nawab was accused of being unable to control the rebellious Chiefs and Talukdars.