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TEACHING & RESEARCH
APTITUDE
Compulsory Paper-I

Solved Papers

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NTA UGC NET/JRF Exam, December-2023

Teaching & Research Aptitude

First Paper : Shift-II

[Exam Date : 19.12.2023]

Solved Paper with Explanation

The following table shows the number of employees working in five different colleges A-E, along with the ratio of Males to Females [M : F] among them. Based on the data in the table, answer the questions that follow.

College-wise Details of Employees

College	Number of Employees	Ratio
		M : F
A	3040	13 : 6
B	3360	4 : 3
C	2920	9 : 11
D	2760	10 : 13
E	2840	13 : 7

1. What is the total number of male employees taking all the Colleges together?

- (a) 8120 (b) 8240
(c) 8360 (d) 8560

Ans. (c) According to the question,

Number of male employees in college A

$$= 3040 \times \frac{13}{19}$$

$$= 2080$$

Number of male employees in college B

$$= 3360 \times \frac{4}{7}$$

$$= 1920$$

Number of male employees in college C

$$= 2920 \times \frac{9}{20}$$

$$= 1314$$

Number of male employees in college D

$$= 2760 \times \frac{10}{23}$$

$$= 1200$$

Number of male employees in college E

$$= 2840 \times \frac{13}{20}$$

$$= 1846$$

Hence the total number of male employees taking all the colleges together

$$= 2080 + 1920 + 1314 + 1200 + 1846$$

$$= 8360$$

2. What is the average number of female employees taking all the colleges together?

- (a) 1312
(b) 1372
(c) 1336
(d) 1292

Ans. (a) : According to the question

Number of female employees in college A

$$= 3040 \times \frac{6}{19}$$

$$= 960$$

Number of female employees in college B

$$= 3360 \times \frac{3}{7}$$

$$= 1440$$

Number of female employees in college C

$$= 2920 \times \frac{11}{20}$$

$$= 1606$$

Number of female employees in college D

$$= 2760 \times \frac{13}{23}$$

$$= 1560$$

Number of female employees in college E

$$= 2840 \times \frac{7}{20}$$

$$= 994$$

∴ Average number of female employees taking all the college together

$$= \frac{960 + 1440 + 1606 + 1560 + 994}{5}$$

$$= \frac{6560}{5}$$

$$= 1312$$

3. The number of male employees working in Colleges A and C together is approximately _____% more than the number of female employees working in colleges B and D together.

- (a) 9
(b) 15
(c) 11
(d) 13

Ans. (d) : According to the question,
Number of male employees working in college A and C

$$= 3040 \times \frac{13}{19} + 2920 \times \frac{9}{20}$$

$$= 2080 + 1314$$

$$= 3394$$

Number of female employees working in college B and D

$$= 3360 \times \frac{3}{7} + 2760 \times \frac{13}{23}$$

$$= 1440 + 1560$$

$$= 3000$$

$$\therefore \text{Required increase \%} = \frac{3394 - 3000}{3000} \times 100$$

$$= 13.13\%$$

$$\approx 13\%$$

4. **What is the ratio of female employees working in College D to that in College E?**

- (a) 7 : 4 (b) 780 : 497
(c) 390 : 491 (d) 9 : 5

Ans. (b) : From question,

\therefore Required ratio

$$= \frac{\text{Number of female employees working in college D}}{\text{Number of female employees working in college E}}$$

$$= \frac{2760 \times \frac{13}{23}}{2840 \times \frac{7}{20}}$$

$$= \frac{1560}{994}$$

$$= \frac{780}{497}$$

$$= 780 : 497$$

5. **The number of employees working in College C is approximately _____ % more than that in College D.**

- (a) 8 (b) 6
(c) 4 (d) 10

Ans. (b) : From question,

$$\therefore \text{Required increase \%} = \frac{2920 - 2760}{2760} \times 100$$

$$= 5.767\%$$

$$= 6\% \text{ (approx)}$$

6. **An economics teacher wants to create an infographics to explain supply and demand to her students.**

Which of the following tools would be most suitable?

- (a) Edpuzzle (b) Canva
(c) Quizlet (d) Mindmeister

Ans. (b) : An economics teacher wants to create an infographics to explain supply and demand to her students, in this case the tool which will be most suitable is Canva. Canva is an easy to use design platform that allows you to create a variety of graphics for your business, classrooms and students.

Given below are two statements:

Statement I : Norm referencing is used to interpret a score of an individual by comparing it with those of other individuals.

Statement II : Criterion referencing is used to interpret a person's performance by comparing it to some specified behavioral domain.

7. **In the light of the above statements, choose the most appropriate answer form the options given below:**

- (a) Both Statement I and Statement II are correct.
(b) Both Statement I and Statement II are in correct.
(c) Statement I is correct but Statement II is in correct.
(d) Statement I is in correct but Statement II is correct.

Ans. (a) : A norm referenced test scores a test by comparing a persons performance to others who are similar. Therefore statement I is correct.

Criterion referenced assessment is the process of evaluating the learning of students against a set of pre-specified qualities of criteria, without reference to the achievement of others. Therefore statement II is also correct.

8. **Which of the following are the elements of observational learning?**

- (A) Production (B) Attention
(C) Identification (D) Retention
(E) Motivation

Choose the correct answer from the options given below:

- (a) (B), (C) and (D) Only
(b) (A) and (E) Only
(c) (A), (B), (D) and (E) Only
(d) (C) Only

Ans. (c) : Observational learning is the process of learning by watching the behaviors of others. The targeted behaviors is watched, memorized and then mimicked. According to bandura's research, there are four processes of elements that influence abersvational learning.

- a - Attention
b - Retention
c - Production/ Reproduction.
d - Motivation

9. **In 'VARK' model of learning styles, 'A' stands for _____.**

- (a) Auspicious (b) Augmentary
(c) Authentic (d) Aural

Ans. (d) : The VARK learning style model introduced by Fleming includes a questionnaire that identifies a person's sensory modality preference in learning. This model classifies students into four different learning modes which are as:-

V - Visual - Pictures, movies, diagrams

A - Aural - Music, discussion, lectures.

R - Read/write - textbooks and notes

k - kinesthetic - movement, experiments.

10. When a very bright light is incident on our eyes, we immediately close our eyelids.

This is an example of _____.

- (a) Biological instincts
- (b) Reflex actions
- (c) Desired instincts
- (d) Intrapersonal instincts

Ans. (b) : When a very bright light is incident on our eyes, we immediately close our eyelids. This is an example of reflex actions. Reflex action is an involuntary and automatic response to a specific stimulus. Reflex action is a type of behavior that is not consciously controlled by spinal cord and peripheral nerves.

11. Identify the disadvantages of open ended question in survey research.

- (A) The questions do not suggest certain kinds of answer to respondents.
- (B) They are time consuming for interviewers to administer.
- (C) They require greater effort from respondents.

Choose the correct answer from the options given below:

- (a) (A) and (B) Only (b) (B) and (C) Only
- (c) (A) and (C) Only (d) (A), (B) and (C)

Ans. (b) : Open ended questions are free from survey questions that allow and encourage. Respondents to answer in open text format to answer based on their complete knowledge. Feeling and understanding. The disadvantages of open ended questions in survey research are

- They are hence consuming for interviewers to administer.
- They require greater effort from respondents.
- Difficult to compare
- A lot of irrelevant information
- Hard to analyze.

12. In a reference written in APA style, arrange the information pertaining to the information pertaining to the reference in correct order.

- (A) DOI number
- (B) Volume number
- (C) Name of author
- (D) Title of the article

Choose the correct answer from the options given below:

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

Ans. (d) : APA style provides a foundation for effective scholarly communication because it helps writers present their ideas in a clear, precise and inclusive manner. APA is the style of documentation of sources used by the American Psychological Association. An reference written in APA style, the correct arrangement of information pertaining to the reference in correct order is as:-

- Name of Author
- Title of the Article
- Volume Number
- DOI number

13. A research study is said to have heuristic value if:

- (a) It leads to no further research
- (b) It generates more research
- (c) Its results lack consistency
- (d) Its results lack validity

Ans. (b) : A research study is said to have heuristic value if it generates more research. A heuristic value is how well something encourages thinking. A heuristic is a mental shortcut commonly cognitive overload.

14. An entrance examination with objective type questions is conducted. For each correct answer, 1 mark is awarded and each incorrect answer 0.25 marks are deducted. The number of marks scored by candidates who appeared in the examination, is an example of :

- (a) Nominal variable
- (b) Discrete variable
- (c) Ordinal variable
- (d) Continuous variable

Ans. (b) : An entrance examination with objective type questions is conducted- for each correct answer, 1 mark is awarded and for each incorrect answer 0.25 marks are deducted. The number of marks scored by candidates who appeared in the examination is an example of discrete variable. Discrete variables are numeric variable that have a countable number of values between any two values.

15. Given below are two statements :

Statement I : Medical research usually involves pain or distress in animals.

Statement II : Psychological research is usually benign and may involve little, if any, discomfort for the animals.

In the light of the above statements, choose the most appropriate answer from the options given below:

- (a) Both Statement I and Statement II are correct.
- (b) Both Statement I and Statement II are in correct.
- (c) Statement I is correct but Statement II is in correct.
- (d) Statement I is in correct but Statement II is correct.

Ans. (a) : Medical research is also known as health research which aims to improve the health and well being of the people. It usually involves pain or stress in animals or human beings. Therefore statement I is correct. A foundational aspect of the discipline of psychology is teaching about and research on the behavior or non human animals. Studying other animals is critical to understanding basic principles underlying behavior and to advancing the welfare of both human and non human animals. Therefore statement II is also correct.

16. A photograph constitutes a/an :

- (a) Protective text
- (b) Refined text
- (c) Closed text
- (d) Open text

Ans. (d) : A photograph constitutes an open text.

17. The Buddhist concept of communication is marked by:

- (a) Mono-causality
- (b) Dyadic causality
- (c) Multi-causality
- (d) Skewed causality

Ans. (c) : The Buddhist concept of communication is marked by multi causality. The Buddhist ethics of speech are quite consistent with the prominent universal principle of ethical communication that comprises of four elements which are, mutuality, open-mindedness, honesty and respect. Multi - causation theory is an outgrowth of the Domino theory but it postulates that for a single accident there may be many contributory factors, causes and sub causes, and that certain combinations of these give rise to accidents.

18. At present, cyber communication is a:

- (a) Fictitious reality
- (b) Palpable reality
- (c) Futuristic reality
- (d) Conventional reality

Ans. (b) : At present, cyber communications is a palpable reality. Palpable means apprehensible as real or existent where as perceptible applies to what can be discerned by the senses often to a minimal extent when something is palpable, you can touch or handle it, even though the word is used to describe things that usually can't be handled or touched, such as emotions or sensations.

19. The main objectives of public policy sphere communication is to involve citizens in:

- (A) Idea generation
- (B) Policy critique
- (C) Innovative policy practices
- (D) Ignoring oppositional views
- (E) Promotion of stereotypes

Choose the correct answer form the options given below:

- (a) (A), (B) and (C) Only
- (b) (B), (C) and (D) Only
- (c) (C), (D) and (E) Only
- (d) (A), (D) and (E) Only

Ans. (a) : The public sphere is the arena where citizens come together exchange opinions, regarding public affairs, discuss, deliberate and eventually form public opinion. The main objectives of public policy sphere communication to involve citizens in idea generation, policy critique and innovative policy practices.

20. Given below are tow statements:

Statement I : Western communication models examined the relationship among communicative elements on an individual basis.

Statement II : The Buddhist concept of communication emphasizes the contextualization of each to the communicative elements.

In the light of the above statements, choose the most appropriate answer from the options given below:

- (a) Both Statement I and Statement II are true.
- (b) Both Statement I and Statement II are false.
- (c) Statement I is true but Statement II is false.
- (d) Statement I is false but Statement II is true.

Ans. (a) : Western communication places a high value on directness, clarity and assertiveness. communication in western societies tends to be move explicit and goal oriented and individualistic values are emphasized over collective values. Therefore statement I is correct.

The Buddhist communication emphasizes the contextualisation of each of the communication elements.

Therefore statement II is also correct.

21. A man, a woman and a boy can do a piece of work in 6, 9 and 18 days, respectively. How many boys should assist one man and one woman to do the work in one day?

- (a) 13
- (b) 15
- (c) 11
- (d) 10

Ans. (a) : Let the required number of children be x According to the question,

$$\frac{1}{6} + \frac{1}{9} + \frac{x}{18} = 1$$

$$\Rightarrow \frac{3+2+x}{18} = 1$$

$$\Rightarrow 5 + x = 18$$

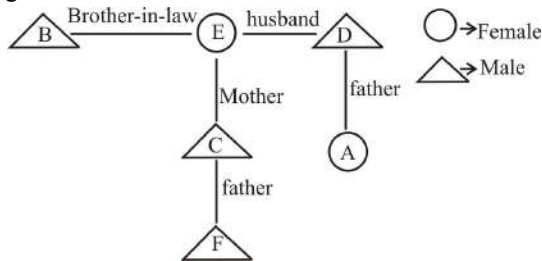
$$\Rightarrow x = 13$$

Hence, 13 children will be required.

22. A family consists of 6 members namely A, B, C, D, E and F. B is the brother-in law of C's mother, C is the father of F. D is the father of A and F is the grandson of D. There are two female members in the family. Which of the following pairs represent the female members in the family?

- (a) A and D (b) D and E
(c) A and E (d) B and C

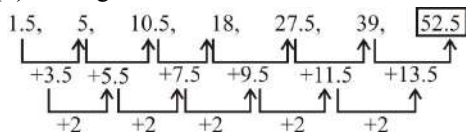
Ans. (c) : According to the question, blood relation diagram is as follows-



Hence it is clear from above figure that A and E represent the female members in the family.

23. Find the number that can replace question mark (?) in the series given below.
1.5, 5, 10.5, 18, 27.5, 39, ?,
- (a) 48.5 (b) 52.5
(c) 62.5 (d) 72.5

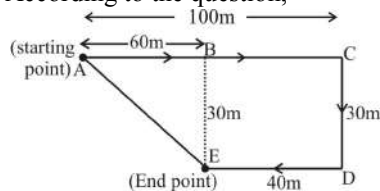
Ans. (b) : The given series is as follows -



Hence ? = 52.5

24. A child is looking for his father. He goes 100 meter towards east and then turns to his right and goes 30 meters. From there the child again turns to his right and goes for 40 meters. Where he finds his father at his uncle's place. How far is his uncle's place from the starting point of the child?
- (a) $30\sqrt{5}$ meter (b) 40 meter
(c) $40\sqrt{5}$ meter (d) $30\sqrt{5}$ meter

Ans. (a) : According to the question,



$$\begin{aligned} \therefore \text{Required distance (AE)} &= \sqrt{(60)^2 + (30)^2} \\ &= \sqrt{3600 + 900} \\ &= \sqrt{4500} \\ &= 30\sqrt{5} \text{ m} \end{aligned}$$

25. In a certain coding language :
(a) 1000 i.e. 10^3 is coded as 1331
(b) 125 i.e. 5^3 is coded as 216
How 729 will be coded in that language ?
(a) 1000 (b) 1728
(c) 1331 (d) 2197

Ans. (a) : Just as,

$$1000 \rightarrow 10^3 \rightarrow (10 + 1)^3 = 1331$$

and

$$125 \rightarrow 5^3 \rightarrow (5 + 1)^3 = 216$$

Same as,

$$729 \rightarrow 9^3 \rightarrow (9 + 1)^3 = 1000$$

Hence, 729 will be coded as 1000.

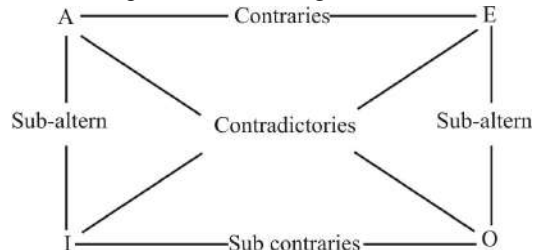
26. Which of the following statements are contradictory to each other?
(A) All plants are fungi
(B) No plants are fungi
(C) Some plants are not fungi
(D) Some plants are fungi
Choose the correct answer form the options given below:
(a) (B) and (D) Only (b) (A) and (B) Only
(c) (C) and (D) Only (d) (A) and (D) Only

Ans. (a) : All plants are fungi — A

No plants are fungi — E

Some plants are fungi — I

Some plants are not fungi — O



From the above we can easily make out that B- (No plants are fungi) and D (Some plants are fungi) are contradictories.

27. If the statement "All trucks are polluting vehicles" is given as false, then which of the following statements can be immediately inferred to be true?
(a) Some trucks are polluting vehicles.
(b) Some trucks are not polluting vehicles.
(c) No trucks are polluting vehicles.
(d) No polluting vehicles are trucks.

Ans. (b) : If the statement - " All trucks are polluting vehicles" is given as false, then "Some trucks are not polluting vehicles" can be immediately inferred to be true.

28. Which of the following statements is equivalent to the statement - "Some philosophers are not idealists."?

- (a) Some philosophers are not non-idealists.
- (b) No idealists are philosophers.
- (c) Some non-idealists are not philosophers.
- (d) Some non-idealists are not non-philosophers.

Ans. (d) : The statement "Some non idealists are not non-philosophers" is equivalent to the statement- "some philosophers are not idealists".

29. Which fallacy is involved in the following statement "Indian pharmaceutical companies are profitable, therefore, average Indian pharmaceutical company is profitable"?

- (a) Fallacy of Division
- (b) Hasty Generalization
- (c) Slippery Slope
- (d) Fallacy of Accident

Ans. (a) : In the statement "Indian pharmaceutical companies are profitable, therefore, average Indian pharmaceutical company is profitable" fallacy of division is involved. This fallacy involves some one taking and attribute of a whole or a class and assuming that it must also necessarily be true of each part or member.

30. Given below are two statements:

Statement I : The Aristotelian syllogism is only inductive and formal.

Statement II : Nyaya syllogism is deductive - inductive and formal-material.

In the light of the above statements, choose the most appropriate answer from the options given below:

- (a) Both Statement I and Statement II are true.
- (b) Both Statement I and Statement II are false.
- (c) Statement I is true but Statement II is false.
- (d) Statement I is false but Statement II is true.

Ans. (d) : Aristotelian syllogism is deductive and formal. Aristotelian syllogism consists of three successive assertions, the first two are the premises and the third is the conclusion therefore statement I is false. The Nyaya syllogism is deductive-inductive and formal - material. The Nyaya syllogism recognizes the fact that verbal form is not the essence of inference. Therefore statement II is correct.

31. An advantage to business that uses Intranet capabilities is that it allows employees to share the business's information with :

- (a) Customers
- (b) Each other
- (c) Competitors
- (d) Former employees

Ans. (b) : An advantage to a business that uses Intranet capabilities is that it allows employees to share the business's information with each other. Intranets encourage communication within an organization. They let employees easily access important information, links, applications, forms and databases of company records.

32. Consider the following MS-EXCEL screenshot that shows the product code, name of the state which produced the product and Quality of the product:

	A	B	C	D
1	Product Code	State	Quality	
2	A1	HP	A	
3	A2	MP	A	
4	A3	UP	A	
5	A4	UP	B	
6	A5	UP	B	
7				

Which of the following EXCEL formulae can be typed in Cell D1 to answer the question :How many different product codes form UP are of Grade "A" quality?

A. = COUNTIFS (B2:B6, "=UP", C2:6,"=A")

B. = COUNTIFS (C2:C6,"=A" B2:B6,"=UP")

C. = COUNTIFS (B2:B6, "=UP" C2:C6,"=A")

Choose the correct answer from the options given below:

- (a) (A) and (B) Only
- (b) (A) and (C) Only
- (c) (B) and (C) Only
- (d) (A), (B) and (C)

Ans. (d) : The following EXCEL formulae can be type in cell D1 to answer the question: How many different product codes from UP are of grade "A" quality.

A = COUNTIFS (B2:B6, " =UP", C2:6, "=A")

B = COUNTIFS (C2:CC6, "=A", B2:B6, "=UP")

C = COUNTIFS (B2:B6, "UP", C2:C6, "A")

33. Given below are two statements:

Statement I: 'Disk defragmentation' makes files that are contiguous in a disk as fragmented.

Statement II: A device controller that controls a device will deal with the operating system through device driver.

In the light of the above statements, choose the most appropriate answer from the options given below:

- (a) Both Statement I and Statement II are true.
- (b) Both Statement I and Statement II are false.
- (c) Statement I is true but Statement II is false.
- (d) Statement I is false but Statement II is true.

Ans. (d) : Defragmentation consolidates these fragmented files so all the related pieces are aligned together. Therefore 'Disk defragmentation' makes files that are contiguous in a disk as fragmented is false.

A device controller that controls a device will deal with the operating system through device driver. This statement is true.

34. Which of the following statements regarding artificial Intelligence (AI) is/are correct ?

- (A) AI systems can be used in email spam filters.
- (B) AI systems are capable of analyzing uncertain information.
- (C) An AI system is a system for capturing, storing, processing and displaying data related to positions on earth's surface.

Choose the correct answer from the options given below:

- (a) (A) Only
- (b) (A) and (B) Only
- (c) (A) and (C) Only
- (d) (B) and (C) Only

Ans. (b) : Artificial intelligence (AI) refers to the simulation or approximation of human intelligence in machines. The goals of artificial intelligence include computer enhanced learning, reasoning and perception. The following statements are correct regarding Artificial Intelligence (AI)

- AI systems can be used in email spam filters.
- AI systems are capable of analyzing uncertain information.

35. Which of the following features are available in word processing software such as MS-WORD ?

- (A) Spell checker and Thesaurus
- (B) Page Orientation
- (C) Mail Merge
- (D) Slide Transitions

Choose the correct answer from the options given below:

- (a) (A), (B) and (D) Only
- (b) (A) and (C) Only
- (c) (B) and (C) Only
- (d) (A), (B) and (C) Only

Ans. (d) : A word processor is a device of software program capable of creating, storing and printing text documents. The features of word processor are as follows:-

- a - Spell checker and Thesaurus
- b - Page orientation
- c - Mail merge
- d - Font specifications
- e - Graphics
- f - Collaboration tools

36. Which one of the following is not caused by polluted water ?

- (a) Cholera
- (b) Dysentery
- (c) Typhoid
- (d) Tuberculosis

Ans. (d) : Contaminated water and poor sanitation are linked to transmission diseases such as Cholera, Diarrhoea, Dysentery, Hepatitis A, Typhoid and Polio. Tuberculosis is not caused by polluted water. Inadequate or inappropriately managed water and sanitation services expose individuals to preventable health risks.

37. Given below are two statements :

Statement : Toxic chemicals injure human organs and organ systems.

Statement : Toxicants that damage kidneys are called as Hepatotoxic.

In the light of the above statements, choose the most appropriate answer from the options given below :

- (a) Both Statement I and Statement II are correct.
- (b) Both statement I and Statement II are incorrect.
- (c) Statement I is correct but Statement II is incorrect.
- (d) Statement I is incorrect but Statement II is correct.

Ans. (c) : Toxic chemical substances may produce adverse effects on the cardiovascular system by acting on the myocardial cells or the autonomic nervous system to affect the heart rate blood pressure etc. Therefore statement I is correct.

Toxicants that damage kidneys are called as nephrotoxic. Therefore Statement II is incorrect.

38. Which of the following are related to 'Source reduction' in integrated solid waste management :

- A) Reduced Toxicity
- B) Composting
- C) Less Packaging
- D) Landfill
- E) More durable products

Choose the correct answer from the options given below :

- (a) (A), (B) and (C) Only
- (b) (A), (C) and (E) Only
- (c) (B), (C) and (D) Only
- (d) (C), (D) and (E) Only

Ans. (b) : Source reduction, also known as waste prevention, aims at reducing unnecessary waste generation. Source reduction strategies may include a variety of approaches, such as designing products for recycling and reusability refurbishing goods to prolong product life of redesign of goods to utilize less or no packaging. Following are related to 'source reduction' in integrated solid waste management.

- Reduced Toxicity
- Less packaging
- More durable products.

39. Depletion of stratospheric ozone results into :

- A) Increase in the ultraviolet radiation
- B) Increase in infra-red radiation
- C) Increase in skin cancer
- D) Significant impact on terrestrial flora and fauna
- E) Decrease in cataract cases

- (a) (A), (B), (C) and (D) Only
- (b) (A), (C) and (D) Only
- (c) (B), (C), (D) and (E) Only
- (d) (A), (B) and (C) Only

Ans. (b) : Stratospheric ozone is formed naturally through the interaction of solar ultraviolet (UV) radiation with molecular oxygen. Depletion of stratospheric ozone results into:-

- Increase in the ultra Violet radiation.
- Increase in skin cancer.
- Significant impact on terrestrial flora & fauna.
- Impaired immune system.

- 40. Nitrous Oxide (N₂O)**
A) Causes acid rain
B) is laughing gas
C) in carcinogenic
D) is a green house gas
E) is a criterion air pollutant
Choose the correct answer form the options given below:
- (a) (A), (D) and (E) Only
 - (b) (C), (D) and (E) Only
 - (c) (B) and (D) Only
 - (d) (A) and (E) Only

Ans. (c) : Nitrous oxide (N₂O) is an odorless, colorless, non-flammable gas but it supports combustion to the same extent as oxygen. It leads to a state of euphoria, explaining its nickname laughing gas. It is also a green house gas and can be used for general anesthesia, procedural sedation, dental anesthesia and to treat severe pain.

- 41. The Michael Sadler commission was constituted to study the problems of:**
- (a) Bombay University (b) Madras University
 - (c) Poona University (d) Calcutta University

Ans. (d) : The Calcutta university commission, sometimes known as the saddler commission was established in 1917 and named for its chairman, Michael Sadler. Investigating the state and future of Calcutta university as a goal concentrating on the problem of constructive policy in regard to the posed question.

- 42. The National Education Policy, 1986 recommended the establishment of _____ in the country.**
- (a) Community colleges
 - (b) Open Universities
 - (c) National Universities of eminence
 - (d) Discipline-wise Universities

Ans. (b) : The NPE 1986 had a significant impact on the education system in India and served as a guideline for educational reforms and development over the years. Its recommendations were:-

- Setting of open universities
- Setting up of primary schools in remote areas.
- It proposed a National system of education based on the accepted structure of 10 + 2 + 3.

- 43. Given below are two statements :**
Statement I : Curzon's university reforms reflected the official attitude towards the spread of higher education in India :
Statement II : There was no resistance to the Indian universities Bill piloted by Curzon from any section of Indians.
In the light of the above statements, choose the most appropriate answer form the options given below.
- (a) Both Statement I and Statement II are true.
 - (b) Both Statement I and Statement II are false.
 - (c) Statement I is true but Statement II is false.
 - (d) Statement I is false but Statement II is true.

Ans. (c) : Curzon's university reform represents a climax in the official attitude against been developing since mid 1850s. Therefore statement I is correct. Despite strong and sustained opposition from Indian population, the recommendations were enacted by Curzon as Indian Universities act 1904. Therefore statement II is false.

- 44. Match List - I with List - II :**
- | List - I | List - II |
|--------------|----------------|
| (A) Panini | (I) Astronomy |
| (B) Jivaka | (II) Grammar |
| (C) Bhaskara | (III) Medicine |
| (D) Kanada | (IV) Physics |
- Choose the correct answer from the options given below :**
- (a) (A) - (III), (B)- (II), (C)-(I), (D)-(IV)
 - (b) (A)-(II), (B)-(I), (C)-(III), (D)-(IV)
 - (c) (A)-(II), (B)-(III), (C)-(I), (D)-(IV)
 - (d) (A)-(II), (B)-(IV), (C)-(I), (D)-(III)

Ans. (c) : The correct match is as follows:-

List I	List II
(Ancient thinkers)	(Area of study)
a - Panini	Grammar
b - Jivaka	Medicine
c - Bhaskara	Astronomy
d - Kanada	Physics.

- 45. Match List - I with List - II :**
- | List - I | List - II |
|-------------------------------|-------------------------|
| (Name of University) | (Year of Establishment) |
| (A) Bombay University | I) 1916 |
| (B) Delhi University | (II) 1943 |
| (C) Utkal University | (III) 1922 |
| (D) S.N.D.T. Women University | (IV) 1857 |
- Choose the correct answer from the options given below :**

- (a) (A) - (IV), (B)- (III), (C)-(II), (D)-(I)
 (b) (A)-(III), (B)-(IV), (C)-(II), (D)-(I)
 (c) (A)-(IV), (B)-(III), (C)-(I), (D)-(II)
 (d) (A)-(III), (B)-(II), (C)-(IV), (D)-(I)

Ans. (a) : The correct match is as follows:-

List I (Name of University)	List II (Year of Establishment)
a - Bombay University	1857
b - Delhi University	1922
c - Utkal University	1943
d - SNTD women University	1916

Read the passage and answer the questions that follow:

Science and the techniques to which it has given rise have changed human life during the last hundred and fifty years more than it had been changed since men took to agriculture, and the changes that are being wrought by science continue at an increasing speed. There is no sign of any new stability to be attained on some scientific plateau. On the contrary, there is every reason to think that the revolutionary possibilities of science extend immeasurably beyond what has so far been realized. Can the human race adjust itself quickly enough to these vertiginous transformations of will it, as innumerable former species have done, perish from lack of adaptability? The dinosaurs were, in their day the lords of creation, and if there had been philosophers among them, not one would have foreseen that the whole race might perish. But they became extinct because they could not adapt themselves to a world without swamps. In the case of man and science there is a wholly new factor, namely that man himself is creating the changes of environment to which he will have to adjust himself with unprecedented rapidity. But, although man through his scientific beings. Although they come about through human agencies, they have, or at any rate have had so far, something of the inexorable inevitability of natural forces. whether Nature dried up the swamps of men deliberately drained them, makes little deference as regards the ultimate result. Whether men will be able to survive the changes of environment that their own skill has brought about is an open question. if the answer is in the affirmative, it will be known some day, if not, not. If the answer is to be in the affirmative, men will have to apply scientific ways of thinking to themselves and their institutions.

46. **Dinosaurs became extinct because of:**
- (a) A massive earthquake
 (b) Incessant rainfall
 (c) Extreme cold
 (d) lack of adaptability

Ans. (d) : According to the passage the Dinosaurs became extinct because they could not adapt themselves to a world without swamps.

47. **In the scientific age who is responsible for the changing environment?**

- (a) Nature (b) Man
 (c) Natural Disasters (d) Wars

Ans. (b) : According to the passage, in the scientific age man himself is creating the changes of environment to which he will have to adjust himself with unprecedented rapidity.

48. **The main focus of the passage is on:**

- (a) Extinction of species
 (b) Extinction of Dinosaurs
 (c) Science and Human life
 (d) Distraction of Forests

Ans. (c) : The main focus of the passage is on science and human life.

49. **"If the answer is in the affirmative....." refers to the question related to:**

- (a) Changes in environment
 (b) Human survival
 (c) Human extinction
 (d) Changes in scientific approach

Ans. (b) : According to the passage "If the answer is in the affirmative, it will be known some day. refers to the question related to human survival.

50. **According to the passage the following are true?**

- A) Science is bringing about rapid changes.
 B) There is every likelihood that a scientific plateau will be reached.
 C) Man will definitely perish like the Dinosaurs.
 D) There are chances that mankind may become extinct due to lack of adaptability.
 E) Change in the environment made through human agencies have so far shown almost the same inexorable inevitability as that of natural forces in the past.
- (a) (A), (D) and (E) Only
 (b) (A), (B) and (E) Only
 (c) (A) and (E) Only
 (d) (B),(C) and (E) Only

Ans. (a) : According to the passage the following are true.

- a- Science is bringing about rapid changes
 b - There are chances that mankind may become extinct due to lack of adaptability.
 c- Changes in the environment made through human agencies have so far shown almost the same inexorable inevitability as that of natural forces in the past.

NTA UGC NET/JRF Exam, December-2023

Teaching & Research Aptitude

First Paper : Shift-I

[Exam Date : 14.12.2023 Re.]

Solved Paper with Explanation

Comprehension :

The following table shows the distance travelled by a boat moving upstream (in km) during five different days of a week from Monday to Friday, along with the speed of boat (in km/hour), speed of stream (in km/hour) and total time taken (in hours). Some data is missing in the table (indicated as '-') that you are expected to calculate, if required. Based on the data in the table, answer the questions that follow.

Day-wise distance covered by a Boat and other Details.

Days	Distance Upstream (km)	Speed of Boat (km/hour)	Speed of stream (km/hour)	Total time taken (hours)
Monday	320	-	4	-
Tuesday	-	-	-	75
Wednesday	270	-	6	-
Thursday	-	11	7	-
Friday	324	-	-	72

Note- (1) Distance Upstream = Distance Downstream, if not stated otherwise

(2) Total time taken = Downstream time + Upstream time

1. On Friday, if the ratio of speed of boat to speed of stream is 2:1, then what is the difference between the time taken by the boat to go upstream and to go downstream ?

- (a) 36 hours (b) 42 hours
(c) 45 hours (d) 35 hours

Ans. (a) : Let the speed of boat and stream be $2x$ and x respectively.

According to the question,

$$\frac{324}{x} + \frac{324}{3x} = 72$$

$$\frac{972 + 324}{3x} = 72$$

$$\frac{1296}{3x} = 72$$

$$3x \times 72 = 1296$$

$$x = \frac{1296}{216}$$

$$x = 6$$

Hence the difference between the time taken

$$= \frac{324}{6} - \frac{324}{18}$$

$$= 54 - 18$$

$$= 36 \text{ hours.}$$

2. On Monday, if the difference between the time taken by the boat to go upstream and to go downstream is 20 hours, then what is the total time taken by the boat to go upstream and downstream ?

- (a) 40 hours (b) 30 hours
(c) 80 hours (d) 60 hours

Ans. (d) : Let the speed of boat be x km/h.

Given, speed of stream be 4 km/h.

Then,

Speed of boat downstream = $(x + 4)$ km/h

Speed of boat upstream = $(x - 4)$ km/h

According to the question,

$$\frac{320}{x - 4} - \frac{320}{x + 4} = 20$$

$$\frac{320x + 1280 - 320x + 1280}{(x - 4)(x + 4)} = 20$$

$$\frac{2560}{x^2 - 16} = 20$$

$$x^2 = 144$$

$$x = 12$$

Hence the total time taken by the boat to go upstream

$$\text{and downstream} = \frac{320}{(12 + 4)} + \frac{320}{(12 - 4)}$$

$$= \frac{320}{16} + \frac{320}{8}$$

$$= 20 + 40$$

$$= 60 \text{ hours}$$

3. On Tuesday, if the difference between the time taken by the boat to go upstream and downstream is 45 hours and the downstream speed is 24 km/hour, then what is the total distance covered by the boat to go upstream and downstream?

- (a) 680 km (b) 720 km
(c) 740 km (d) 540 km

Ans. (b) : Let the total distance be x km.

Downstream speed = 24 km/h

Upstream speed = y km/h

$$\frac{x}{y} - \frac{x}{24} = 45 \text{ ----- (i)}$$

$$\frac{x}{y} + \frac{x}{24} = 75 \text{ ----- (ii)}$$

From equation (i) and (ii) -

$$\frac{2x}{y} = 120$$

$$x = 60y$$

Putting the value of $x = 60y$ in equation (i),

$$\frac{60y}{y} + \frac{60y}{24} = 75$$

$$60 + \frac{60y}{24} = 75$$

$$60y = 360$$

$$y = 6$$

and $x = 60y$
 $= 60 \times 6$
 $= 360$

Hence the Total distance covered by the boat
 $= 360 + 360$
 $= 720 \text{ km}$

4. **On Wednesday, if the boat covered half of the distance upstream with usual speed and other half with double its speed and it takes $33\frac{3}{4}$ hours less time the usual time to go upstream, then what is the total time taken by the boat to go upstream and downstream?**

- (a) 128 hours (b) 120 hours
(c) 108 hours (d) 92 hours

Ans. (c) : Let the usual speed of boat = $x \text{ km/h}$.

According to the question,

$$\frac{135}{x-6} - \frac{135}{2x-6} = \frac{135}{4}$$

$$\frac{135(2x-6) - 135(x-6)}{(2x-6)(x-6)} = \frac{135}{4}$$

$$\frac{135x}{2x^2 - 12x - 6x + 36} = \frac{135}{4}$$

$$2x^2 - 18x + 36 = 4x$$

$$2x^2 - 22x + 36 = 0$$

$$x^2 - 11x + 18 = 0$$

$$(x-9)(x-2) = 0$$

$$x = 9$$

Total time taken = Upstream + Downstream.

$$\frac{270}{9-6} + \frac{270}{9+6}$$

$$= 90 + 18$$

$$= 108 \text{ km/h.}$$

5. **On Thursday, the difference between the time taken by the boat to cover 'X' km upstream and (X + 120) km downstream is 26 hours. Had the boat covered the same distance upstream as downstream, then what would have been the difference in the time taken?**

- (a) 58 hours (b) 62 hours
(c) 48 hours (d) 56 hours

Ans. (d) : Distance covered by boat upstream = $X \text{ km}$
Distance covered by boat downstream = $(X + 120) \text{ km}$
According to the question,

$$\frac{X}{4} - \frac{X+120}{18} = 26$$

$$\frac{9X - 2X - 240}{36} = 26$$

$$7X - 240 = 26 \times 36$$

$$X = \frac{1176}{7} = 168$$

Distance = 168

Now downstream distance = $168 + 120 = 288$

Hence the required difference = $\frac{288}{4} - \frac{288}{18}$
 $= 72 - 16$
 $= 56 \text{ घंटा}$

6. **Which of the following tools can be used for virtual labs and simulations?**

- (a) Plotagon
(b) Wakelet
(c) PhET Interactive Simulations
(d) Flipgrid

Ans. (c) : PhET Interactive simulations can be used for virtual labs and simulations. PhET Simulations provide fun, interactive research based simulations for use in k-12 and college STEM education. PhET simulation based. Learning provides visualizations and teaching aids that help easily understand content knowledge hence improving student's academic achievement and motivation laves.

7. **Which of the following is the driving force for students' commitment, engagement and persistence in self-directed learning?**

- (a) Fixation (b) Motivation
(c) Metacognition (d) Assessment

Ans. (b) : Self-directed learning can be described as a six-step process: developing goals for study; outlining assessment with respect to how the learner will know when they achieve those goals, identify the structure. And sequence of activities, lay out a timeline to complete activities, identify resources to achieve each goal. Motivation is the driving force for student's commitment engagement and persistence in self-directed learning.

8. Given below are two statements:

Statement I: Passive style is a way of dealing with conflict in which people are nonassertive and submissive and don't let others know what they want.

Statement II: Manipulative style is a way of dealing with conflict in which people try to get what they want by making others feel guilty for them.

In the light of the above statements, choose the most appropriate answer from the options given below:

- (a) Both statement I and statement II are correct.
- (b) Both statement I and statement II are incorrect.
- (c) Statement I is correct but statement II is incorrect.
- (d) Statement I is incorrect but statement II is correct.

Ans. (a) : Passive style is a way of dealing with conflict in which people are nonassertive and submissive and don't let others know what they want. Non assertive or passive people may complain, but usually do nothing to gain control in their argumentative environment, because they fear they will lose from additional conflict encounters. Manipulative style is a way of dealing with conflict in which people try to get what they want by making others feel guilty for them.

So both statement I and Statement II are correct.

9. When students, who have learned to type on a typewriter, transfer this skill to typing on a computer keyboard, it is an example of _____ learning?

- (a) Far-transfer
- (b) High-road transfer
- (c) Near transfer
- (d) Low-road transfer

Ans. (c) : When students, who have learned to type on a typewriter, transfer the skill to typing on a computer keyboard, it is an example of near transfer learning. Near transfer occurs when you transfer the knowledge gained in one situation to another, similar situation. For example, learning to drive involves learning a variety of skills.

10. Which factor plays a crucial role in creating an effective learning environment ?

- (a) Teacher's qualification
- (b) Availability of instructional facilities
- (c) Focus on foreign language use
- (d) Admission to students from elite class

Ans. (b) : An effective learning environment is created by factors such as innovative school design, cross - disciplinary instruction, collaborative learning, individualized Curriculum, Ubiquitous technologies and specialized equipment. Availability of instructional facilities plays a crucial role in creating an effective learning environment.

11. Identify the software that would be useful for statistical analysis of data generated in a research study :

- (A) SPSS
- (B) Ithenticate
- (C) MINITAB
- (D) R

Choose the correct answer the options given below:

- (a) (A), (B) and (C) only
- (b) (B), (C) and (D) only
- (c) (A), (C) and (D) only
- (d) (A), (B) and (D) only

Ans. (c) : The software that would be useful for statistical analysis of data generated in a research study are

- (A) SPSS
- (B) MINITAB
- (D) R

SPSS (statistical package for the social sciences), also known as IBM SPSS statistics, is a software package used for the analysis of statistical data. Minitab statistical software can look at current and past data to discover trends, find and predict patterns, uncover hidden relationship between variables. R is also popular programming language that allows people to adeptly handle mass amounts of data, generate publication - quality visualizations, and perform a range of statistical and analytic computing tasks.

12. Given below are two statements:

Statement I: The quantitative content analysis in Social science research is a very transparent research method.

Statement II: The quantitative content analysis is often referred to as obtrusive method.

In the light of the above statements, choose the most correct answer from the options given below:

- (a) Both statement I and statement II are correct.
- (b) Both statement I and statement II are incorrect.
- (c) Statement I is correct but statement II is incorrect.
- (d) Statement I is incorrect but statement II is correct.

Ans. (c) : Content Analysis is a research method used to analyze qualitative data by systematically categorizing and interpreting the content of the communication. The quantitative content analysis in social science research is a very transparent research method.

So statement I is true but statement II is false.

13. In the context of a published research article, DOI stands for:

- (a) Data object Integration
- (b) Digital Object Identifier
- (c) Data Object Interface
- (d) Digital Object Interface

Ans. (b) : In the context of a published research article, DOI stands for Digital object Identifier. A DOI is a string of numbers letters and symbols used to uniquely identify an article or document, and to provide it with a permanent web address (URL).

14. Which of the following measures would be useful for commenting upon the degree of asymmetry in a statistical distribution ?

- (a) Central tendency (b) Dispersion
(c) Kurtosis (d) Skewness

Ans. (d) : Skewness is a statistical measure that is used to show whether a distribution is distorted or asymmetrical.

Skewness is demonstrated on a bell curve when data points are not distributed symmetrically to the left and right sides of the medium on a bell curve. If the bell curve is shifted to the left or the right, it is said to be skewed.

15. Which of the following correctly represents the meaning of the abbreviation "vide" used in academic writing?

- (a) Against (b) Width
(c) Refer to (d) Namely

Ans. (c) : "refer to" correctly represents the meaning of the abbreviation "vide" used in academic writing.

16. A kind of fixation with medium itself is conceptualised as:

- (a) Hypermediacy (b) Immediacy
(c) Media tendency (d) Multi-mediacy

Ans. (a) : A kind of fixation with medium itself is conceptualized as hypermediacy. Hypermediacy is a "style of visual representation whose goal is to remind the viewer of the medium.

17. Generally cyberspace is compared to a type of electronic

- (a) Screen (b) Exhibition Room
(c) Compus (d) Open Space

Ans. (d) : "Cyberspace" is the term used to describe the electronic medium of digital networks used to store, modify and communicate information. It includes the internet but also other information system that support businesses, infrastructure and services. Generally cyberspace is compared to a type of electronic open space.

18. Which of the following statements are true in respect of communication?

- (A) Communicated meaning are always ambiguous
(B) Words are symbols for concepts
(C) Labels may be ambiguous
(D) Symbols are usually understood within a group
(E) Sharing of meaning is not possible in communication

Choose the correct answer from the options given below:

- (a) (A), (B) and (C) only
(b) (B), (C) and (D) only
(c) (C), (D) and (E) only
(d) (A), (B) and (E) only

Ans. (b) : Communication is commonly defined as the transmission of information. It is a continuous process that mainly involves three elements viz. Sender, message, and receiver.

The statements are three respect of Communication :-

- (B) Words are symbol for concepts
(C) Labels may be ambiguous.
(D) Symbols are usually understood within a group.

19. Given below are two statements:

Statement I: Communication cannot reflect the cultural conduct of people.

Statement II: Communication is a practice integral to formation of social life.

In the light of the above statements, choose the most appropriate answer from the options given below:

- (a) Both statement I and statement II are correct.
(b) Both statement I and statement II are incorrect.
(c) Statement I is correct but statement II is incorrect.
(d) Statement I is incorrect but statement II is correct.

Ans. (d) : Communication reflect the cultural conduct of people. Culture can affect how people communicate in different ways. It may affect Communication styles in aspect such a phrases, words gestures and languages used. Communication an integral part of our society, the ability to learn form, share and connect to one-another, on a global scale has enabled the human species to develop technologies. So Communication is a practice integral to formation of social life. So this statement is true. Therefore statement I is incorrect but statement II correct.

20. Given below are two statements:

Statement I: Communication is a social process in which people use symbols to interpret meanings in their own environment.

Statement II: people and their intraction are not part of the communications process, because communication cannot be social.

In the light of the above statements, choose the most appropriate answer from the options given below:

- (a) Both statement I and statement II are correct
(b) Both statement I and statement II are incorrect.
(c) Statement I is correct but statement II is incorrect.
(d) Statement I is incorrect but statement II is correct.

Ans. (c) : Communication is a social process, in which individuals employ symbols to establish and interpret meaning in their environment. It involves people and interactions, whether face-to-face or online. It includes two people, who act as senders and receiver. Both play a role in the communication process.

So statement I is correct but statement II is incorrect

21. A car starts running with the initial speed of 50 km/hour, with its speed increasing every hour by 5 km/per hour. How many hours will it take to cover a distance of 630 km?

- (a) 7 hours (b) 9 hours
(c) 6 hours (d) 8 hours

Ans. (b) : Speed of car = 50 km/h

∴ The car increases its speed by 5 km/h every hour then,

Distance covered in 1st hour = 50 km

Distance covered in 2nd hour = 50 + 5 = 55 km

Distance covered in 3rd hour = 60

Distance covered in 4th hour = 65

Distance covered in 5th hour = 70

Distance covered in 6th hour = 75

Distance covered in 7th hour = 80

Distance covered in 8th hour = 85

Distance covered in 9th hour = 90

Total distance covered in 9 hour = 50 + 55 + 60 + 65 + 70 + 75 + 80 + 85 + 90 = 630 km

Hence it is clear from above that it will take 9 hours to cover the distance of 630 km.

22. In a factory, the average salary of the employees is ₹ 7000. If the average salary of 12 officers is ₹ 4000 and that of the remaining employees is ₹ 6000, then the number of employees is:

- (a) 402 (b) 404
(c) 406 (d) 408

Ans. (d) : let the number of employees be x.

Average salary of employees in factory = ₹7000

According to the question,

$$7000x = 12 \times 4000 + (x - 12) \times 6000$$

$$7000x = 12 \times 4000 + 6000 \times x - 12 \times 6000$$

$$= 12(4000 - 6000) + 6000x$$

$$7000x = 12 \times 34000 + 6000x$$

$$1000x = 12 \times 34000$$

$$x = 408$$

Hence the number of employees be 408.

23. The sum of three numbers is 124. If the ratio between the first and the second is 2:3 and between the second and the third is 7:9, then the third number is:

- (a) 48 (b) 54
(c) 64 (d) 66

Ans. (b) : Given that,

The sum of three numbers = 124

According to the question,

$$I : II = [2 : 3] \times 7$$

$$II : III = [7 : 9] \times 3$$

$$I : II : III = 14 : 21 : 27$$

Let the first, second and third number be 14x, 21x and 27x respectively.

Then, $14x + 21x + 27x = 124$

$$62x = 124$$

$$x = 2$$

Hence, the third number = 27x

$$= 27 \times 2 = 54$$

24. What will be the value of P in the following number series?

0, 2, 24, 252, P,

- (a) 3120 (b) 1029
(c) 2045 (d) 630

Ans. (a) : The given series is as follows -

$$0 \quad 2 \quad 24 \quad 252$$

$$\downarrow \quad \downarrow \quad \downarrow \quad \downarrow$$

$$1^2 - 1 \quad 2^2 - 2 \quad 3^3 - 3 \quad 4^4 - 4$$

Similarly,

$$P = 5^5 - 5 = 3125 - 5 = 3120$$

Hence option (a) is correct.

25. The cost price of an article is 75% of its marked price for sale. How much percent does the trades man gain after allowing a discount of 15%?

- (a) 20% (b) $13\frac{1}{3}\%$
(c) 10% (d) $15\frac{2}{3}\%$

Ans. (b) : Let the marked price be = ₹100

$$\text{cost price} = 100 \times \frac{75}{100} = ₹75$$

$$\text{Selling price} = 100 - 100 \times \frac{15}{100} = ₹85$$

$$\text{Profit} = 85 - 75 = ₹10$$

$$\text{Profit \%} = \frac{10}{75} \times 100$$

$$= 13\frac{1}{3}\%$$

26. Which of the following statement are so related that they cannot both be true, nor can they both be false?

- (A) All mammals are vertebrates
(B) Some mammals are vertebrates
(C) Some mammals are not vertebrates
(D) No mammals are vertebrates

Choose the correct answer from the options given below:

- (a) (A) and (B) only (b) (B) and (D) only
(c) (C) and (D) only (d) (A) and (D) only

Ans. (b) : Statements " some mammals are vertebrates" and "No mammals are vertebrates" are so related that they cannot both be true, nor can they both be false.

27. Which of the following statement is logically equivalent to the statement-"All rectangles are polygon"?

- (a) Some rectangles are polygon
(b) No rectangles are non-polygon
(c) No-non-rectangles are non-polygon
(d) All non-polygons are rectangles

Ans. (b) : "No rectangles are non-polygon" is the correct statement that is logically equivalent to the statement " All rectangles are polygon."

Following are the properties of rectangle -

- * Two pairs of parallel sides.
- * Opposite sides are of equal length
- * Interior angles are all 90°

28. Arrange the following terms in order to increasing intension:

- (A) Cheese
(B) Dairy Product
(C) Soft Cheese
(D) Strong soft cheese

Choose the correct answer from the options given below:

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

Ans. (a) : The Increasing order of the given terms according to their quality is as follows-

Dairy product → cheese → soft cheese → strong soft cheese.

29. Political stability is indispensable to economic progress because economic progress can only be achieved by means of political stability'. Which informal fallacy is committed in the above statement?

- (a) Slippery slope
(b) Red Herring
(c) Hasty Generalisation
(d) Begging the question

Ans. (d) : "Political stability is indispensable to economic progress because economic progress can only be achieved by means of political stability". In this statement begging the question fallacy is committed.

30. Given below are two statement:

Statement I: The proposition "The hill has fire because it is knowable" commits the fallacy of the irregular middle.

Statement II: The proposition "Sound is eternal, because it is audible" commits the fallacy of the irregular middle.

In the light of the above statements, choose the most appropriate answer from the options given below:

- (a) Both statement I and statement II are correct.
(b) Both statement I and statement II are incorrect.
(c) Statement I is correct but statement II is incorrect.
(d) Statement I is incorrect but statement II is correct.

Ans. (a) : The proposition "The hill has fire because it is knowable" commits the fallacy of the irregular middle. This statement is correct. The fallacy of the irregular middle term. Occurs when a term that is not distributed is used as the middle term in a categorical syllogism. The proposition "Sound is eternal, because it is audible" commits the fallacy of the irregular middle. So both statement I and Statement II are Correct.

31. Given below are two statements:

Statement I: Google is a web search engine, while google chrome is a web browser.

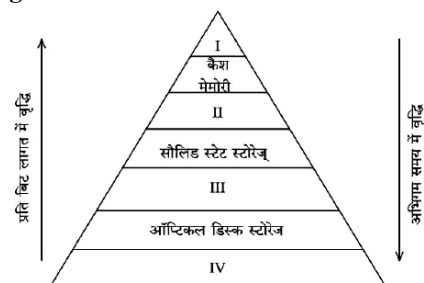
Statement II: Microsoft edge is a web search engine, while Microsoft Bing is a web browser.

In the light of the above statements, choose the most appropriate answer from the options given below:

- (a) Both statement I and statement II are correct.
(b) Both statement I and statement II are incorrect.
(c) Statement I is correct but statement II is incorrect.
(d) Statement I is incorrect but statement II is correct.

Ans. (c) : Google is a web search engine, while Google chrome is a web browser. Browsers like Google chrome and Mozilla Firefox are software programs used to access the internet through a URL. Meanwhile search engines, such as Google and Bing, are software application that employ crawlers to find specific information on the world wide web using keywords. So statement I is correct but statement II is incorrect.

32. Consider the following memory hierarchy diagram:



Which of the following memories A-D represent I, II, III and IV (in that order) ?

- (A) Magnetic Tape
(B) Magnetic hard disk
(C) Random access memory
(D) Processor registers

Choose the correct answer from the options given below:

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

Ans. (d) : The correct answer of memories A-D represent I, II, III, and IV are as follows -
 $D > C > B > A$

(D) Processor Registers - A processor register (CPU register) is one of a small set of data holding places that are part of the computer processor.

(C) Random Access Memory - It is the hardware in a computing device where the operating system (OS), application programs and data in current use are kept so they can be quickly reached by the device's processor.

(B) Magnetic Disk Memory - A magnetic Disk is a type of secondary memory that is a flat disc Covered with a magnetic coating to hold information.

(A) Magnetic Tape - Magnetic tape is one of the eldest technologies for electronic data storage.

33. Match List-I with List-II:

List-I (ICT term)	List-II (Definition)
Firewall	1. Used to remember user's preferences each time they visit websites.
Digital certificate	2. Hardware or software that sits between user's computer and an external network, which filters data coming to and from the computer
Cookies	3. Software, firmware or hardware that creates and runs a virtual machine
Hypervisor	4. Pairs of files stored on user's computer each pair contains a public key and private key

Choose the correct answer from the options given below:

- | | A | B | C | D |
|-----|---|---|---|---|
| (a) | 2 | 1 | 4 | 5 |
| (b) | 1 | 4 | 2 | 3 |
| (c) | 2 | 4 | 1 | 3 |
| (d) | 3 | 4 | 1 | 2 |

Ans. (c) :

List I (ICI terms)	List II (Definition)
(A) Firewall	(II) Hardware or software that sits between a user's Computer and an external network which filters data coming to and from the computer.

(B) Digital Certificate (IV) Pairs of files stored on user's computer each pair contains a public key and private key.

(C) Cookies (I) Used to remember user's preferences each time they visit websites.

(D) Hyper visor (III) Software, firmware or hardware that Creates and runs a virtual machine.

34. Consider the following Ms-Excel work sheet:

	A	B	C
1	Month	Number of classes taught	Payments (in ₹) made @ 1500 per class
2	January	20	30000
3	February	14	21000
4	March	17	25500
5	April	13	19500
6	May	12	18000
7	June	15	22500

The value returned by Function = SUMIFS (C2 : C7, B2 : B7, ">13", C2 : C7, ">22500") is:

- (a) 78000 (b) 76500
 (c) 99000 (d) 55500

Ans. (d) : The following is the Syntax of SUMIFS function.

SUMIFS (Sum_range, criteria_rangel, criteria) [criteria_rangesm criteria2],.....)

According to above Syntax, the function given in the question, when applying criteria "13" to column range B2 : B7 in SUMIFS (C2 : C7, B2 : B7, ">13", C2 : C7, ">22500") the values are 20, 14, 17 respectively and the values of their payouts are 30000, 21000, 25500 and 22500 respectively where as applying criteria ">22500" of column range C2 : C7 gives the values of range C2 : C7 will be 30000 and 22500 respectively whose summed by 5000 function and the result will be 30000 + 22500 = 555000.

35. Given below are two statement with refers to the different number systems:

Statement I : $(0.6875)_{10} = (0.1011)_2$

Statement II : $(111011.101)_2 = (58.625)_{10}$

In the light of the above statements, choose the most appropriate answer from the options given below:

- (a) Both statement I and statement II are correct.
 (b) Both statement I and statement II are incorrect.
 (c) Statement I is correct but statement II is incorrect.
 (d) Statement I is incorrect but statement II is correct.

Ans. (c) : Statement I

$$(0.6875)_{10} = (0.1011)_2$$

0	.6875×2
---	---------

1	.375×2
---	--------

0	.75×2
---	-------

1	.5×2
---	------

1	.0×2
---	------

$$(0.6875)_{10} = (0.1011)_2$$

Thus statement I is true.

$$\text{And Statement II } (111011.101)_2 = (58.625)_{10}$$

$$(111011.101)_2 = 1 \times 2^5 + 1 \times 2^4 + 1 \times 2^3 + 0 \times 2^2 + 1 \times 2^1 + 1 \times 2^0 + 1 \times 2^{-1} + 0 \times 2^{-2} + 1 \times 2^{-3}$$

$$= 32 + 16 + 8 + 0 + 2 + 1 + 0.5 + 0 + 0.125$$

$$= 59.625$$

$$(111011.101)_2 = 59.625$$

So statement I is true but statement II is wrong.

36. Given below are two statements:

Statement I: Photovoltaic cell produce Alternating current (A.C.).

Statement II: Photovoltaic cells are exposed directly to the sun, therefore as temperature rises leakage across the cell increases.

In the light of the above statements, choose the most appropriate answer from the options given below:

- (a) Both statement I and statement II are correct.
- (b) Both statement I and statement II are incorrect.
- (c) Statement I is correct but statement II is incorrect.
- (d) Statement I is incorrect but statement II is correct.

Ans. (d) : Photovoltaic cell generate direct current (DC) electricity. Photovoltaic (PV) materials and devices convert sunlight into electrical energy. Photovoltaic cells are exposed directly to the sun, therefore as temperature rises leakage across the cell increases.

37. Which of the following pairs of elements is most important for eutrophication process?

- (a) Calcium-magnesium
- (b) Nitrogen-phosphorus
- (c) Nickel-cobalt
- (d) Iron-copper

Ans. (b) : Nitrogen - phosphorus pairs of element is the most important for eutrophication process. When water bodies are excessively rich in these nutrients, the growth of algae, plankton and other simple plant life is prioritized over more complex plant growth. Eutrophication is the process in which a water body becomes extremely rich in nutrients.

38. The standard coagulant in water treatment is:

- (a) Hypochloride
- (b) Chlorine
- (c) Aluminium
- (d) Alum

Ans. (d) : Coagulation is one of the common methods used by water treatment plants to provide safe, clean drinking water to public water customers. The most commonly used chemical for coagulation is aluminum sulfate (Alum). Ferric sulfate, ferric chloride or sodium aluminate are also popular types of coagulants.

39. Given below are two statements : One is labelled as Assertion (A) and the other is labelled as Reason (R):

Assertion (A): PM₁₀ is preferred over Total Suspended Particles (TSP) for air quality monitoring studies.

Reason (R): Particles larger than 10 micron are better indicator of potential health effects of particulate air pollution.

In the light of the above statements choose the most appropriate answer from the options given below:

- (a) Both (A) and (R) are correct and (R) is the correct explanation of (A).
- (b) Both (A) and (R) are correct but (R) is not the correct explanation of (A).
- (c) (A) is correct but (R) is not correct.
- (d) (A) is not correct but (R) is correct.

Ans. (c) : Total suspended particulates (TSPs) are all the particles of air pollutants, while particulate matter (PM) refers to the smallest suspended pollutants in the air. PM₁₀ is the group of particles with a diameter of 10 μm and PM 2.5 is for those smaller than 2.5 μm. PM₁₀ is preferred over total suspended particles (TSP) for air quality monitoring.

Small particles less than 10 micrometers in diameter pose the greatest problems, because they can get deep into your lungs and some may even get into your bloodstream

So (A) is correct but (R) is not correct.

40. Given below are two statements :

Statement I: The Richter Scale measures not only the intensity of earthquake itself, but its impact on people too.

Statement II: The modified mercalli scale measures the earthquake in terms of energy released.

In the light of the above statements, choose the most appropriate answer from the options given below:

- (a) Both statement I and statement II are correct.
- (b) Both statement I and statement II are incorrect.
- (c) Statement I is correct but statement II is incorrect.
- (d) Statement I is incorrect but statement II is correct.

Ans. (b) : The Richter scale is used to rate the magnitude of an earthquake, that is the amount of energy released, during an earthquake. The Richter Scale measures

Earthquakes ranging from a magnitude of 1 to a magnitude of 10.

10 represents the highest level of earthquake. While the intensity of an earthquake is measured by the modified mercalli scale.

Thus Mercalli scale is used to measure the intensity of an earthquake while Richter Scale is used to measure the magnitude scale of an earthquake.

So Both statement I and Statement II are incorrect.

41. Which of the following Open universities was established in accordance with the National Education Policy, 1986 :

- (a) Dr. B.R. Ambedkar Open University Hyderabad
- (b) Indira Gandhi National Open University Delhi
- (c) Karnataka State Open University, Mysore
- (d) Yashwant Rao Chavan Maharashtra Open University, Nasik

Ans. (b) : The National Education Policy (NEP) is a policy formulated by the Government of India to promote and regulate education in India. This policy launched "Operation Blackboard" to improve primary schools.

Open University	Establishment
Dr. B.R. Ambedkar open University	1982 (First open University)
Indira Gandhi open University	1985

42. Which of the following universities in ancient India had six colleges each under them and had a lot of exchange of ideas between them ?

- (A) Sridhanya katak
- (B) Nalanda
- (C) Takshashila
- (D) Vikramashila

Choose the correct answer from the options given below:

- (a) (A) and (B) only
- (b) (B) and (D) only
- (c) (C) and (D) only
- (d) (A) and (D) only

Ans. (b) : Nalanda and Takshashila Universities in ancient India had six colleges each under them and had a lot of exchange of ideas between them. Nalanda University was built by Kumar Gupta of the Gupta dynasty in the 5th century BC. The Takshashila University was located in Rawalpindi, in present-day Pakistan.

43. Find out the correct chronological order of the establishment of following universities in India:

- (A) Agra University
- (B) Delhi University
- (C) Nagpur University
- (D) Andhra University
- (E) University o Calcutta

Choose the correct answer form the options given below:

- (a) (B), (C), (A), (E), (D)
- (b) (E), (B), (C), (D), (A)
- (c) (C), (D), (A), (E), (B)
- (d) (A), (E), (B), (D), (C)

Ans. (b) : The correct chronological order of the establishment of Universities in India is as follows -

University	Establishment
University of Calcutta	- 1857
Delhi University	- 1922
Nagpur University	- 1923
Andhra University	- 1926
Agra University	- 1927

44. Match List-I with List-II:

List-I (Commission Committee)		List-II (Focus area)	
A.	Sadler commission	1.	Functioning of UGC and AICTE
B.	Hartog committee	2.	university education in India
C.	Radhakrishnan commission	3.	Comprehensive report on education in India
D.	Yashpal committee	4.	Functioning of Calcutta university

Choose the correct answer from the options given below:

- | | A | B | C | D |
|-----|---|---|---|---|
| (a) | 2 | 3 | 1 | 4 |
| (b) | 3 | 4 | 2 | 1 |
| (c) | 1 | 2 | 4 | 3 |
| (d) | 4 | 3 | 2 | 1 |

Ans. (d) :

List I (Commission/Committee)	List II (Focus area)
(A) Sadler Commission	(IV) functioning of Calcutta University
(B) Hartog Committee	(III) Comprehensive report on education in India
(C) Radhakrishnan Commission	(II) University education in India.
(D) Yashpal Committee	(I) Functioning of UGC and AICTE

45. Given below are two statements:

Statement I: Financing higher education in a country like India depends upon availability of resources and other financial implications.

Statement II: According NEP 2020, funding and financing of higher education will be carried out by the second vertical of Higher education Commission of India i.e. Higher Education Grants Council.

In the light of the above statements, choose the most appropriate answer from the options given below: