

PART - A

Directions (for the next 05 items that follow) :

Given below are some idioms/phrases followed by alternatives to each. Select the most appropriate alternative which provides the correct meaning of the idiom/phrase and mark your response on the Answer Sheet accordingly.

1. 'Burn your bridges'
 - (a) Ending one's life
 - (b) To make a decision you cannot change
 - (c) To ignore danger
 - (d) To settle an argument
2. 'Make no bones about something'
 - (a) To do your own thing
 - (b) To make no money
 - (c) To not try to hide one's feelings
 - (d) To not come right to the point
3. 'A blot on the landscape'
 - (a) A painting that has turned out wrong
 - (b) A bald patch in a meadow
 - (c) A black sheep in an office
 - (d) Something ugly that spoils the appearance of a place
4. 'A bone of contention'
 - (a) Source of agreement
 - (b) Point of long standing dispute
 - (c) A hidden agenda
 - (d) Legal obligation
5. 'Pour oil on troubled waters'
 - (a) To mastermind a trick or deception
 - (b) To produce something that is required as if by magic
 - (c) To exacerbate a festering situation
 - (d) To say or do something to stop an argument or calm down a situation

Directions (for the next 05 items that follow) :

Each of the following sentences has an underlined word. Read the sentence carefully and identify which word class the underlined word belongs to. Indicate your response on the Answer Sheet accordingly.

6. Despite the heavy rain, the match continued as scheduled.
 - (a) Conjunction
 - (b) Adverb
 - (c) Noun
 - (d) Preposition
7. He gave both candidates an equal opportunity to present their case.
 - (a) Determiner
 - (b) Pronoun
 - (c) Adverb
 - (d) Adjective
8. The old woman sat on the bench, knitting in silence.
 - (a) Verb
 - (b) Adjective
 - (c) Adverb
 - (d) Noun
9. The injured soldier crawled forward in spite of debilitating pain.
 - (a) Noun
 - (b) Adverb
 - (c) Adjective
 - (d) Preposition
10. The results were beyond everyone's expectation.
 - (a) Preposition
 - (b) Conjunction
 - (c) Adjective
 - (d) Adverb

Directions (for the next 10 items that follow) :

Each item in this section consists of a sentence with an underlined word followed by four words. Select the word that is **opposite in meaning** to the underlined word and mark your response on the Answer Sheet accordingly.

11. During the trial, the witness's deposition was equivocal. ✓

- (a) ✓ ambiguous - not clear
- (b) evasive
- (c) explicit ✓
- (d) guarded ✓

12. The professor is known for his characteristic reticence.

- (a) communicativeness ✗
- (b) reserve ✓
- (c) restraint ✗
- (d) diffidence ✗

13. Observers noted the officials' increasingly capricious approach to administrative reforms.

- (a) erratic
- (b) ✓ whimsical
- (c) ✓ ceremonial
- (d) ✓ steadfast

14. The novel presents an idealistic view of the ongoing political reform.

- (a) visionary
- (b) ✓ utopian
- (c) ✓ pragmatic
- (d) ✓ romantic

15. The speaker's tone became increasingly caustic during the debate.

- (a) ✓ sarcastic
- (b) ✓ conciliatory
- (c) ✓ acerbic
- (d) ✓ acrimonious

16. The note drew attention to the fallacious assumptions underlying the proposals.

- (a) ✓ veracious - truthful
- (b) misleading → not truthful
- (c) procedural ✗
- (d) erroneous ✗

17. The activist was sceptical with regard to the antecedents of the newly discovered documents.

- (a) ✓ restrained
- (b) ✓ credulous
- (c) ✓ circumlocutory
- (d) ✓ guarded

18. The panel found the conclusion somewhat speculative.

- (a) ✓ conjectural
- (b) ✓ hypothetical
- (c) ✓ substantiated
- (d) ✓ interpretive

19. After the mishap, the mood was sombre among the survivors.

- (a) ✓ shady
- (b) ✓ dingy
- (c) ✓ restrained
- (d) ✓ buoyant

20. He is a professional artist.

- (a) ✓ apprentice
- (b) ✓ dilettante
- (c) ✓ amateur
- (d) ✓ aspirant

Directions (for the next 05 items that follow) :

Each item in this section consists of a sentence with an underlined word followed by four words. Select the word that is **nearest in meaning** to the underlined word and mark your response on the Answer Sheet accordingly.

21. The controversial policy received the committee's imprimatur.
(a) criticism
(b) approval
(c) rejection
(d) appraisal
22. The archaeologist was fascinated by the annular design of the ancient monument.
(a) circular
(b) vertical
(c) triangular
(d) funicular
23. The nobility is not known for its munificence.
(a) reluctance
(b) valour
(c) generosity
(d) graciousness
24. The goods kept in the storage facility were declared to be contraband.
(a) prohibited
(b) taxable
(c) foreign
(d) adulterated
25. The judge ruled on the egregious violations of human rights by the authorities.
(a) subtle
(b) flagrant
(c) inadvertent
(d) concealed

Directions (for the next 05 items that follow) :

Given below are some foreign phrases followed by four alternatives to each. Select the most appropriate alternative which provides the correct meaning of the foreign phrase used in English and mark your response on the Answer Sheet accordingly.

26. *Ipso facto*
(a) After the fact
(b) In fact
(c) By the fact itself
(d) The primary factor
27. *Via media*
(a) Through newspapers
(b) Through diplomacy
(c) In secrecy
(d) A middle way
28. *Quid pro quo*
(a) The existing state of affairs
(b) Therefore or consequently
(c) Something given in exchange for something else
(d) Done for public good without compensation
29. *A posteriori*
(a) At the very beginning
(b) Based on reasoning from known facts or empirical evidence
(c) Military campaign leading to swift victory
(d) A person with a sociable and expansive lifestyle
30. *Modus operandi*
(a) The most appropriate word
(b) Method of operating
(c) The violation of a rule
(d) Successful operation

31. A sentence is given in three parts (a), (b) and (c). Find out which part of the sentence has an error. If there is no error, mark your option (d). Indicate your response on the Answer Sheet accordingly.

- (a) He is a honest man
(b) who has served
(c) this institution for twenty years
(d) No error

32. A sentence is given in three parts (a), (b) and (c). Find out which part of the sentence has an error. If there is no error, mark your option (d). Indicate your response on the Answer Sheet accordingly.

- (a) The jury has delivered
(b) its verdict after
(c) long and careful deliberations
(d) No error

33. Read the following pairs :

	Active Voice	Passive Voice
I.	These grapes taste sour.	These grapes are sour when they are tasted.
II.	Forget the past.	Let the past be forgotten.

Identify the pair(s) wherein the Passive Voice is correctly stated and mark your response on the Answer Sheet accordingly.

- (a) I only
(b) II only
(c) Both I and II
(d) Neither I nor II

34. Read the following pairs :

	Active Voice	Passive Voice
I.	They asked me my name.	My name was asked by them.
II.	They found him guilty.	He found them guilty.

Identify the pair(s) wherein the Passive Voice is correctly stated and mark your response on the Answer Sheet accordingly.

- (a) I only
(b) II only
(c) Both I and II
(d) Neither I nor II

35. Read the following pairs :

	Direct Speech	Indirect Speech
I.	He said, "Bravo! You have written the best answer."	He applauded him saying that he had written the best answer.
II.	"The sun rises in the East," said the teacher.	The teacher said that the sun rose in the East.

Identify the pair(s) wherein the Indirect Speech is correctly stated and mark your response on the Answer Sheet accordingly.

- (a) I only
(b) II only
(c) Both I and II
(d) Neither I nor II

36. Read the following pairs :

	Direct Speech	Indirect Speech
I.	He said to him, "Wait here until I return."	He ordered him to wait here until he returned.
II.	He said, "Alas! I am undone."	He exclaimed sadly that he was undone.

Identify the pair(s) wherein the Indirect Speech is correctly stated and mark your response on the Answer Sheet accordingly.

- (a) I only
(b) II only
(c) Both I and II
(d) Neither I nor II

37. Read the following pairs :

	Group of words	One-word substitution
I.	One who studies handwriting	Graphologist
II.	One who draws maps	Cartographer
III.	One who studies flags	Vexillologist

Identify the pairs wherein the one word substitution is correctly stated and mark your response on the Answer Sheet accordingly.

- (a) I and II only
- (b) II and III only
- (c) I and III only
- (d) I, II and III

38. Read the following pairs :

	Group of words	One-word substitution
I.	One who knows everything	Omnipotent
II.	One who is all powerful	Omniscient
III.	One who abandons religious faith	Apostate

Identify the pair(s) wherein the one word substitution is correctly stated and mark your response on the Answer Sheet accordingly.

- (a) I only
- (b) II only
- (c) III only
- (d) I, II and III

39. Fill in the blanks with the most appropriate phrasal verb and mark your response on the Answer Sheet accordingly.

The car tended to _____ every time the rains decided to _____.

- (a) act out; come in
- (b) act up; come down
- (c) act out; come down
- (d) act up; come in

40. Fill in the blanks with the most appropriate phrasal verb and mark your response on the Answer Sheet accordingly.

He was eager to _____ after having resigned his position, but was advised to _____ his next move given the prevailing market situation.

- (a) move on; hold on
- (b) move off; hold off
- (c) move on; hold off
- (d) move off; hold on

prevailing market

Directions (for the next 05 items that follow) :

Reorder the PQRS set to create the most appropriate meaningful sentence. Indicate your response on the Answer Sheet accordingly.

41. The findings were

P : that had long been accepted

Q : because they fundamentally challenged the assumptions

R : met with considerable resistance at first

S : by the mainstream scientific community

The proper sequencing should be :

(a) RQPS

(b) RSPQ

(c) PQSR

(d) PSQR

42. It is often argued that

P : are not the result of innate talent alone

Q : but rather the product of

R : extraordinary achievements

S : sustained effort and deliberate practice

The proper sequencing should be :

(a) SPQR

(b) PSQR

(c) RPQS

(d) QRSP

43. The historian noted that

P: had been systematically erased

First Q: the memory of certain communities

10th R: and replaced with a sanitized narrative

S: from the official records of the colonial period

The proper sequencing should be :

(a) PQRS

(b) QPSR ✓

(c) RQSP

(d) QSPR ✓

44. Critics have long maintained that

P: literature's true power lies in its

Q: assumptions and not in the mere

R: ability to disturb comfortable

S: reproduction of social reality

The proper sequencing should be :

(a) PQRS

(b) PRQS

(c) SPQR ✗

(d) QRSP

45. The movie

P: it was hardly possible

Q: were so humorous that

R: to keep a straight face.

S: had many scenes which

The proper sequencing should be :

(a) PRSQ

(b) SPRQ

(c) QPRS

(d) SQPR ✓

Directions (for the next 05 items that follow) :

The following items have four sentences, one of which is grammatically correct. Select the most appropriate correct sentence and mark your response on the Answer Sheet accordingly.

46. (a) She insisted that he apologises immediately.

(b) She insisted that he apologise immediately. ✓

(c) She insisted that he may apologise immediately.

(d) She insisted that he apologised immediately. ✗

47. (a) The police has arrested the accused last night.

(b) The police have arrested the accused last night. ✓

(c) The police arrested the accused last night.

(d) The police had arrested the accused last night.

48. (a) The teacher made the students to rewrite the essay. ✓

(b) The teacher has the students to rewrite the essay. ✗

(c) The teacher got the students rewriting the essay. ✓

(d) The teacher had the students rewrite the essay.

49. (a) I shall base my decision on how much free time can I manage.

(b) I shall base my decision about how much free time I can manage.

(c) I shall base my decision on how much free time I can manage. ✓

(d) I shall base my decision to how much free time I can manage.

50. (a) Do not panic because a situation is under control.

(b) Do not panic because situation under control. ✗

(c) Do not panic however a situation is under control.

(d) Do not panic because the situation is under control. ✓

PART - B

51. Consider the following statements in relation to respiration in animals :

- I. Glucose breaks down into pyruvate in the cytoplasm of all cells in both aerobic and anaerobic conditions. ✓
- II. The energy released during anaerobic respiration is greater than the energy released in aerobic respiration. ✗
- III. Carbon dioxide is released only in aerobic respiration. ✓ *CO₂ is released*

Which of the statements given above is/are correct ?

- (a) I only ✓
- (b) II only ✗
- (c) I and III ✓
- (d) II and III ✗

52. In humans, the exit of partially digested food from the stomach into the small intestine is regulated by which one of the following structures/processes ?

- (a) Peristalsis ✓
- (b) Muscular walls of stomach ✓
- (c) Sphincter muscle ✓
- (d) Villi in small intestine

53. Which of the following cells form components of complex permanent tissue in plants ?

- I. Companion cells ✓
- II. Sieve tubes ✓
- III. Tracheids ✓
- IV. Vessels ✓

Select the answer using the code given below :

- (a) I, II, III and IV ✓
- (b) II, III and IV only
- (c) I, III and IV only
- (d) I and II only

54. Which one of the following is **not** a part of the hindbrain of human beings ?

- (a) Medulla ✓
- (b) Pons ✓
- (c) Corpus callosum ✓
- (d) Cerebellum

55. Which of the following organisms show external fertilization ?

- I. Pigeon
- II. Frog
- III. Fish
- IV. Lizard

Select the answer using the code given below :

- (a) II, III and IV
- (b) II and III only
- (c) I and IV only
- (d) I, II and III

56. Which one of the following plant groups is characterized by having a haploid plant body?

- (a) Gymnosperms
- (b) Angiosperms
- (c) Pteridophytes
- (d) Bryophytes

57. A flower typically is composed of :

- (a) Stomata, Cotyledon, Petals, Sepals
- (b) Carpels, Sepals, Petals, Cambium
- (c) Carpels, Stamens, Petals, Sepals
- (d) Petals, Sepals, Perianth, Root cap

58. Which one of the following organelles is found in both prokaryotic and eukaryotic cells ?

- (a) Nucleus
- (b) Mitochondria
- (c) Ribosome
- (d) Golgi complex

59. Which one of the following is **not** a connective tissue in the human body ?

- (a) Cardiac muscle
- (b) Cartilage
- (c) Blood
- (d) Bone

60. Which one of the following is **not** a characteristic of an insect-pollinated plant ?

- (a) Brightly coloured and fragrant flowers
- (b) Light and small pollen grains
- (c) Sticky and/or spiny pollen grains
- (d) Presence of nectar in a flower

61. Consider the following statements regarding oxidation numbers :

- I. The oxidation number of oxygen in peroxides and superoxides is assigned as -1 and $-1/2$ respectively.
- II. In all its compounds, fluorine has an oxidation number of -1 .
- III. In a reduction half-reaction, the oxidation number of the reductant decreases.

Which of the statements given above are correct ?

- (a) I and II only ✓
- (b) II and III only
- (c) I and III only ✓
- (d) I, II and III ✓

62. Consider the following statements regarding the properties of hydrogen and water :

- I. Tritium, the isotope of hydrogen, is radioactive and emits low energy alpha particles.
- II. In the gas phase, the structure of water is linear.
- III. The basic principle of a hydrogen economy is the transportation and storage of energy in the form of liquid or gaseous molecular hydrogen.

Which of the statements given above is/are **not** correct ?

- (a) I and II only
- (b) II and III only
- (c) I and III only
- (d) II only

63. Consider the following statements regarding nitrogen :

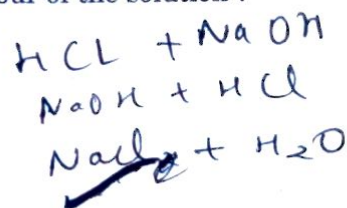
- I. Nitrogen contains a triple bond.
- II. Nitrogen is a triatomic gas. ✓
- III. Forces acting between nitrogen molecules are weak van der Waals forces. ✓

Which of the statements given above are correct ?

- (a) I and II only
- (b) II and III only
- (c) I and III only
- (d) I, II and III

64. In a dry test tube, 2 mL of HCl (0.1 N) is taken. To this, 4 mL of NaOH (0.1 N) is added. The solution is stirred well, followed by the addition of 2 drops of phenolphthalein. What will be the colour of the solution ?

- (a) Colourless
- (b) Red T
- (c) Pink
- (d) Blue f



65. Consider the following statements :

- I. Zinc metal, when treated with both HCl (aq.) and NaOH (aq.) separately, produces molecular hydrogen.
- II. An aqueous copper sulphate solution cannot be kept in a zinc vessel.
- III. Lemon, tamarind and tomato are natural sources of citric acid, oxalic acid and tartaric acid, respectively.

Which of the statements given above are correct ?

- (a) I and II only
- (b) II and III only
- (c) I and III only
- (d) I, II and III

66. Consider the following statements :

- I. A solution of iodine in ethanol known as 'tincture of iodine' is a heterogeneous mixture.
- II. A suspension is a heterogeneous mixture and its particles scatter a beam of light passing through it, making its path visible.
- III. A colloidal solution, although it appears homogeneous, is a heterogeneous mixture.

Which of the statements given above are correct ?

- (a) I and II only
- (b) II and III only
- (c) I and III only
- (d) I, II and III

67. Consider the following statements :

- I. A 30% solution of hydrogen peroxide is marketed as '10 volume' H_2O_2 .
- II. In the compound copper sulphate pentahydrate, all the five water molecules are hydrogen bonded.

Which of the statements given above is/are correct ?

- (a) I only
- (b) II only
- (c) Both I and II
- (d) Neither I nor II

68. Consider the following statements :

- I. The leaves of nettle, a herbaceous plant, cause painful stings when touched accidentally because of the secretion of formic acid.
- II. When gypsum is heated at 100°C , it forms calcium carbonate hemihydrate, called Plaster of Paris.
- III. When moistened with water, anhydrous copper sulphate forms a green-coloured copper sulphate dihydrate.

Which of the statements given above is/are correct ?

- (a) I only
- (b) III only
- (c) II and III
- (d) I and II

$\text{CuSO}_4 \cdot \frac{1}{2} \text{H}_2\text{O}$

69. Consider the following pairs :

	Chemical Reaction	Type of Chemical Reaction
I.	$\text{Fe(s)} + \text{CuSO}_4(\text{aq.}) \rightarrow \text{FeSO}_4(\text{aq.}) + \text{Cu(s)}$	Displacement reaction ✓
II.	$\text{Na}_2\text{SO}_4(\text{aq.}) + \text{BaCl}_2(\text{aq.}) \rightarrow \text{BaSO}_4(\text{s}) + 2\text{NaCl}(\text{aq.})$	Double displacement reaction ✓
III.	$\text{Fe}_2\text{O}_3(\text{s}) + 3\text{CO(g)} \rightarrow 2\text{Fe(s)} + 3\text{CO}_2(\text{g})$	Redox reaction ✓
IV.	$2\text{KClO}_3(\text{s}) \rightarrow 2\text{KCl(s)} + 3\text{O}_2(\text{g})$	Thermal decomposition reaction ✓

How many of the pairs given above are correctly matched ?

- (a) One
- (b) Two
- (c) Three
- (d) All four

$2n - 6 = 0$
 $n = 3$

$3n - 12 = 0$
 $n = 4$
 (15-D)

$3n - 6 = 0$
 $n = 2$

70. What are the approximate percentages by mass of nitrogen and hydrogen respectively in urea?

- (a) 43% and 5%
- (b) 47% and 5%
- (c) 43% and 7%
- (d) 47% and 7%

71. Coconut oil upon hydrolysis with potassium hydroxide gives:

- (a) Free fatty acids and sodium hydroxide
- (b) Glycerol and sodium salts of fatty acids
- (c) Glycol and potassium salts of fatty acids
- (d) Glycerol and potassium salts of fatty acids

72. Consider the following statements regarding hydrogen bonds:

- I. Hydrogen bonds can only form when hydrogen is bonded to oxygen, nitrogen or fluorine.
- II. Hydrogen bonds are intramolecular only.
- III. The strength of a hydrogen bond decreases with a decrease in the electronegativity of the two bonded atoms.

Which of the statements given above is/are **not** correct?

- (a) I only
- (b) II only
- (c) I and II
- (d) II and III

73. Ionic compounds have high melting and boiling points. This is due to:

- (a) the presence of strong electrostatic forces between ions in the crystal lattice.
- (b) the weak intermolecular van der Waals forces.
- (c) the presence of a 'sea of delocalized electrons'.
- (d) lower lattice energy.

74. Which of the following statements is/are correct in respect of Portland cement?

- I. Adding more water (higher water-cement ratio) accelerates the initial setting time of cement.
- II. The addition of a small percentage of gypsum gives the desired retardation.
- III. Gypsum is added during manufacturing to accelerate the setting time of cement.

Select the answer using the code given below:

- (a) I and II
- (b) I and III
- (c) I only
- (d) II only

75. Consider the following pairs:

	Example of Colloid	Type of Colloid
I.	Cloud	Aerosol
II.	Mud	Sol
III.	Milk	Emulsion
IV.	Rubber	Foam

How many of the pairs given above are correctly matched?

- (a) One
- (b) Two
- (c) Three
- (d) All four

76. On a rainy day, rain drops fall vertically with speed v . An observer is moving towards east with speed v , while another observer moves towards north with the same speed v . What is the angle between apparent rain directions observed by them ?

- (a) 0°
- (b) 30°
- (c) 45°
- (d) 60°

77. What is the minimum horizontal speed given to the bob of a simple pendulum of length 50 cm so that it describes a complete circle ?

(Take $g = 10 \text{ m/s}^2$)

- (a) 5 m/s
- (b) 7.5 m/s
- (c) 10 m/s
- (d) 12.5 m/s

$$v_0 = 2\pi \sqrt{\frac{g}{L}}$$

$$= 2\pi \sqrt{\frac{10}{0.5}}$$

$$= 2\pi \sqrt{20}$$

$$= 2\pi \times 4.47$$

$$= 28.1$$

$$\approx 28.1 \text{ m/s}$$

78. Two conducting wires made of the same material have lengths L and $1.2 L$. If the volume of the longer wire is half that of the shorter wire, then what is the electric resistance of the longer wire in comparison with the shorter wire ?

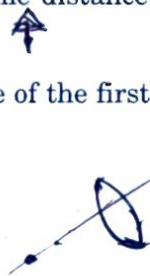
- (a) 288% larger
- (b) 200% larger
- (c) 188% larger
- (d) 108% larger

79. A biconvex lens is made of a material of refractive index 2 such that the ratio of the radii of curvature of its two faces is 1 : 2. A point source in air is placed on the principal axis of this lens at a distance u from the lens. Which one of the following is correct if the image is formed exactly at the same distance as that of the point source ?

(where R is the radius of curvature of the first face)

- (a) $u = R$
- (b) $u = 2R$
- (c) $2u = 3R$
- (d) $3u = 4R$

$$u = 2R$$



80. In a carrom game, a striker of mass 15 g hits a coin of mass 5 g head on and the coin moves with a speed of 0.36 m/s. If the time of contact between the striker and the coin is 3 milliseconds, then what is the average force applied by the striker on the coin ?

- (a) 0.72 N
- (b) 0.60 N
- (c) 0.54 N
- (d) 0.30 N

81. A hollow prism is filled with water of refractive index 1.34 and white light is incident on the prism. The white light is assumed to have wavelengths ranging from $4020 \text{ \AA}$ to $6700 \text{ \AA}$. What is the corresponding wavelength range in water ?

- (a) $3000 \text{ \AA}$ to $5000 \text{ \AA}$
- (b) $4020 \text{ \AA}$ to $6700 \text{ \AA}$
- (c) $5000 \text{ \AA}$ to $7000 \text{ \AA}$
- (d) $5386 \text{ \AA}$ to $8978 \text{ \AA}$

82. A heating filament and an ideal resistor of fixed value are connected in series with a DC voltage source. After some time, the filament has reached its operating point so that the current in the circuit is steady. Which one of the following is correct ?

- (a) The steady current is larger than the initial value.
- (b) The steady voltage across the ideal resistor decreases as compared to its initial value.
- (c) Overall resistance of the circuit decreases.
- (d) Power dissipation through the filament increases as compared to its initial value.

83. Two astronauts X and Y float in deep space far from external forces. Initially, they are at rest relative to one another. X throws a tool towards Y. Consider the two astronauts and the tool as one system. Which one of the following statements is correct ?

- (a) The centre of mass of the system moves towards Y.
- (b) X moves and the centre of mass of the system follows him.
- (c) The centre of mass follows the tool.
- (d) The centre of mass remains fixed.

84. A uniform rope hangs symmetrically over a smooth pulley. One end of the rope is given a slight mass, making that side slightly heavier. Which one of the following is correct ?

- (a) As the rope starts moving, every point on the rope has the same acceleration.
- (b) As the rope starts moving, every point on the rope has the same speed, but not the same acceleration.
- (c) As the rope starts moving, the tension remains the same throughout the rope.
- (d) As the rope starts moving, the centre of mass remains stationary.

85. An insulating container contains 250 g of water at 20°C . Steam at 100°C is passed through it, heating it up to 25°C . During this process, part of the steam also gets condensed, raising the mass of water to 252 g. If the specific heat of water is $1 \text{ Cal g}^{-1} \text{ }^{\circ}\text{C}^{-1}$, then what is the value of the latent heat of steam ?

- (a) 530 Cal/g
- (b) 540 Cal/g
- (c) 550 Cal/g
- (d) 560 Cal/g

86. Three parallel glass slabs of refractive indices 1.5, $\sqrt{3}$ and 1.5 respectively have widths 2 mm, 1 mm and 4 mm. The combination is in air. Light is incident at the first slab at an angle of incidence $\pi/3$. What is the angle with respect to the normal at which the light will emerge from the final surface ?

- (a) $\pi/6$
- (b) $\pi/4$
- (c) $\pi/3$
- (d) $\pi/12$

87. Consider three wires X, Y and Z of the same length such that the ratio of their conductivities is 1 : 2 : 3. Further, the cross-sectional area of wire Z is twice that of Y and the resistance of X is equal to the resistance of Z. What is the ratio of the resistance of Y to that of X ?

- (a) 1 : 1
- (b) 3 : 1
- (c) 2 : 1
- (d) 1 : 2

88. Two point charges of 4 C and 16 C are kept at a distance of 0.18 m. A third point charge of 1 C is kept between them such that the potential energy of the system is minimum. What is the magnitude of the electric field at the 1 C charge ?

- (a) 0
- (b) $\frac{1}{4\pi\epsilon_0} \left(\frac{1}{9} \right) \text{NC}^{-1}$
- (c) $\frac{1}{4\pi\epsilon_0} \left(\frac{2}{9} \right) \text{NC}^{-1}$
- (d) $\frac{1}{4\pi\epsilon_0} \left(\frac{1}{18} \right) \text{NC}^{-1}$

89. Consider the following statements in respect of sound waves :

- I. The speed of sound waves decreases with an increase in temperature if the atmospheric pressure remains the same.
- II. The speed of sound waves increases with increasing humidity if the atmospheric pressure remains the same.
- III. The speed of sound waves is not affected by a change in atmospheric pressure, provided the temperature is kept constant.

Which of the statements given above are correct ?

- (a) I and II only
- (b) II and III only
- (c) I and III only
- (d) I, II and III

90. Consider the following statements :

Statement-I : Marine animals remain alive in winter and move near the bottom of lakes despite frozen water on the surface.

Statement-II : The density of water is maximum at 4°C and water at the bottom of lakes remains warm in winter.

Which one of the following is correct in respect of the above statements ?

- (a) Both Statement-I and Statement-II are correct and Statement-II explains Statement-I.
- (b) Both Statement-I and Statement-II are correct, but Statement-II does not explain Statement-I.
- (c) Statement-I is correct, but Statement-II is not correct.
- (d) Statement-I is not correct, but Statement-II is correct.

91. A bicycle racing track is a level circular road of radius 10 m. Three cyclists P, Q and R with identical cycles are cycling on the track with speeds 2 m/s, 3 m/s and 5 m/s respectively. If the coefficient of friction between the tyres and the road is 0.1, then which cyclist will slip? (Take $g = 10 \text{ m/s}^2$)

- (a) P only
- (b) Q only
- (c) R only
- (d) All will slip

92. The bob of a simple pendulum is displaced from its mean position and then released from rest 0.20 m above its mean position. What is the speed of the bob as it passes through the mean position? (Take $g = 10 \text{ m/s}^2$)

- (a) 0 m/s
- (b) 1 m/s
- (c) 2 m/s
- (d) $\sqrt{10}$ m/s

93. A tennis ball of mass 350 g is thrown vertically upwards at a speed of 4 m/s. If M is the maximum gravitational potential energy of the ball and H is the maximum height it reaches, then which one of the following is correct? (Take $g = 10 \text{ m/s}^2$)

- (a) $M = 5.6 \text{ J}$, $H = 1.6 \text{ m}$
- (b) $M = 2.8 \text{ J}$, $H = 1.6 \text{ m}$
- (c) $M = 5.6 \text{ J}$, $H = 0.8 \text{ m}$
- (d) $M = 2.8 \text{ J}$, $H = 0.8 \text{ m}$

94. Which of the following is correct regarding the total internal reflection at the interface between two different optical media?

- (a) The phenomenon of total internal reflection can occur only if light is passing at any angle from a medium of low refractive index to a medium of high refractive index.
- (b) The phenomenon of total internal reflection can occur only if light is passing from a medium of high refractive index to a medium of low refractive index and at an angle greater than the critical angle. ✓
- (c) The phenomenon of total internal reflection can occur only if light is passing at any angle from a medium of high refractive index to a medium of low refractive index.
- (d) The phenomenon of total internal reflection can occur only if light is passing from a medium of low refractive index to a medium of high refractive index and at an angle greater than the critical angle.

95. Consider the following statements :

- I. The weight of an object is the same everywhere on the surface of the Earth, but its inertial mass could be different.
- II. The inertial mass and gravitational mass of an object are proportional and the proportionality constant is the same everywhere.
- III. The inertial mass and weight of an object are the same at different places on Earth.

Which of the statements given above is/are correct?

- (a) I only
- (b) II only
- (c) I and II
- (d) II and III

96. Consider the following :

- I. Gravitational field due to a spherical body
- II. Electrostatic field due to a point charge
- III. Strong nuclear force field due to a proton
- IV. Magnetic field due to a bar magnet

How many of the above follow the inverse square law ?

- (a) One
- (b) Two
- (c) Three
- (d) All four

97. While pouring water slowly from a jug, a general observation is that a water layer usually flows along the side of the jug. Which property of water among the following is responsible for this phenomenon ?

- (a) Surface tension
- (b) Relatively low vapour pressure at room temperature
- (c) Negligible compressibility
- (d) Low viscosity at room temperature

98. A fish is at a depth d in water of refractive index $4/3$. If a transparent slab of refractive index $3/2$ and thickness $d/2$ is placed on the surface of water, then which one of the following is the apparent depth of the fish as observed by an observer in air ?

- (a) $d/2$
- (b) $5d/8$
- (c) $13d/12$
- (d) $17d/24$

99. A particle of mass m moves along x -direction under the force $F(x) = F_0 \left(1 - \frac{x}{L}\right)$ for $0 \leq x \leq L$. If the particle starts from rest at $x = 0$, then what is the speed (v) of the particle at $x = L$?

(a) $v = \sqrt{\frac{2F_0L}{m}}$

(b) $v = \sqrt{\frac{F_0L}{m}}$

(c) $v = \sqrt{\frac{F_0L}{2m}}$

(d) $v = 0$

100. A narrow tunnel passes through the centre of a planet of radius R and uniform mass density ρ . A particle is released into the tunnel. What is the angular frequency of oscillation of the particle (ω) equal to ? (Symbols carry their usual meaning)

(a) $\omega = \sqrt{\frac{4\pi G\rho}{3}}$

(b) $\omega = \sqrt{\frac{2\pi G\rho}{3}}$

(c) $\omega = \infty$

(d) $\omega = 0$

101. India has engaged in an agreement to supply BrahMos missiles to which of the following countries?

- I. Indonesia ✓
- II. Philippines ✓
- III. Singapore
- IV. Vietnam ✓

Select the correct answer using the code given below :

- (a) I, II and III. ✗
- (b) I, III and IV ✗
- (c) I, II and IV ✓
- (d) II and IV only

102. Ramanujan Fellowship is an initiative of the Department of Science & Technology, Government of India. It was launched under the :

- (a) Research, Development and Innovation Fund
- (b) Anusandhan National Research Foundation
- (c) National Quantum Mission
- (d) National Supercomputing Mission

103. Which of the following countries is **not** a member of the International Big Cat Alliance?

- (a) France ✓
- (b) Somalia
- (c) Sri Lanka
- (d) Saudi Arabia

104. Consider the following statements regarding the 'Green Nobel' :

- I. It is given every alternate year.
- II. In 2026, six winners were chosen and one of the winners is from Asia.
- III. All the winners of 2026 are women.

Which of the statements given above is/are correct?

- (a) I only
- (b) II only
- (c) III only
- (d) II and III

105. Which two countries signed a \$ 2.6 billion uranium supply agreement in March 2026?

- (a) India and Russia
- (b) India and Canada ✓
- (c) India and Australia
- (d) Australia and Canada

106. Consider the following statements regarding Exercise DUSTLIK-2026 :

- I. It is a joint military exercise between India and UAE.
- II. Its aim is to foster military cooperation and enhance combined capabilities to execute joint operations in semi-mountainous terrain.

Which of the statements given above is/are correct?

- (a) I only
- (b) II only
- (c) Both I and II
- (d) Neither I nor II

07. Which of the following statements about 'Vayu Shakti-2026' is/are correct ?

- I. The Vayu Shakti-2026 exercise took place in Jaisalmer, Rajasthan.
- II. Advanced fighter aircraft of the Indian Air Force, including Rafale, HAL Tejas and Mirage 2000 carried out strikes.
- III. Boeing Apache and Boeing Chinook helicopters participated in this exercise.

Select the answer using the code given below :

- (a) I, II and III
- (b) I and III only
- (c) II and III only
- (d) I only

108. Which of the following statements related to water governance is/are correct ?

- I. River Basin Management (RBM) is a Central Sector Scheme under the Ministry of Jal Shakti, Government of India.
- II. The major objectives of the RBM Scheme focus on promoting the use of water for domestic use.
- III. The Brahmaputra Board is one of the key implementing agencies of the RBM.

Select the answer using the code given below :

- (a) I, II and III
- (b) I and III only
- (c) II and III only
- (d) II only

109. Which of the following statements regarding the Khelo India Tribal Games is/are correct ?

- I. The inaugural edition of the Khelo India Tribal Games was organized in two States : Jharkhand and Odisha. ✓
- II. 'Morveer' was the official mascot of these games.
- III. The Khelo India Tribal Games are part of the Khelo India Scheme.

Select the answer using the code given below :

- (a) I, II and III
- (b) I and II only
- (c) II and III only
- (d) III only

110. Consider the following statements :

- I. Over 60% of defence equipment sourced by the Armed Forces of India is now produced domestically.
- II. The Indian defence focus is on scale, resilience and indigenous capability.

Which of the statements given above is/are correct ?

- (a) I only
- (b) II only
- (c) Both I and II
- (d) Neither I nor II

111. Consider the following States :

- I. Tripura
- II. Chhattisgarh
- III. Assam
- IV. Odisha

How many of the States given above have jute mills ?

- (a) One
- (b) Two
- (c) Three
- (d) All four

112. Which one of the following is classified under the physical processes of weathering ?

- (a) Water pressure ✓
- (b) Oxidation ✓
- (c) Carbonation ✓
- (d) Hydration ✓

113. Consider the following statements :

- I. The Steppes of Eurasia are temperate grasslands.
- II. The Pampas of South America are classified as tropical grasslands.

Which of the statements given above is/are correct ?

- (a) I only
- (b) II only
- (c) Both I and II
- (d) Neither I nor II

114. Consider the following statements regarding the slash-and-burn agricultural practices in India :

- I. This practice is a primitive subsistence farming.
- II. This practice is known as Jhum in the North Eastern Hill region.
- III. When soil fertility decreases, farmers shift to a fresh patch of land.

Which of the statements given above is/are correct ?

- (a) I only
- (b) III only
- (c) I and III only
- (d) I, II and III ✓

115. Consider the following statements regarding western disturbances in the Indian climate :

- I. These are shallow cyclonic depressions.
- II. They originate over the Caspian Sea and travel to India.

Which of the statements given above is/are correct ?

- (a) I only
- (b) II only
- (c) Both I and II
- (d) Neither I nor II

116. Consider the following statements regarding earthquake waves :

- I. P-waves are similar to sound waves.
- II. S-waves can travel through gaseous, liquid and solid materials.
- III. The zone between 105° and 145° from the epicentre is identified as the shadow zone for both P- and S-waves.

Which of the statements given above are correct ?

- (a) I and II only
- (b) II and III only
- (c) I and III only
- (d) I, II and III

117. Consider the following statements :

- I. At the equator, the Coriolis force is zero and here the winds blow perpendicular to the isobars.
- II. The Coriolis force is directly proportional to the angle of latitude.
- III. The Coriolis force and the resultant wind do not blow parallel to the isobars at higher latitudes.

Which of the statements given above are correct ?

- (a) I, II and III
- (b) II and III only
- (c) I and III only
- (d) I and II only

118. The Hawaiian volcanoes are the most famous examples of :

- (a) Flood basalt provinces
- (b) Calderas
- (c) Composite volcanoes
- (d) Shield volcanoes

119. The temperate forests in the Nilgiris, Anaimalai and Palani hills are called :

- (a) Myristica
- (b) Kar forest
- (c) Devarakadu
- (d) Sholas

120. Consider the following statements with regard to igneous rocks :

- I. These rocks cannot be changed into metamorphic rocks.
- II. When molten material is cooled slowly at great depths, mineral grains tend to be very small.
- III. These rocks are known as primary rocks.

Which of the statements given above is/are correct ?

- (a) I and II only
- (b) III only
- (c) II and III only
- (d) I, II and III

121. Consider the following statements :

- I. The Prime Meridian is the same as the International Date Line.
- II. West of the International Date Line is always a day later than east of the line.
- III. The Earth turns 15° of longitude in an hour.

Which of the statements given above is/are correct ?

- (a) I and II only
- (b) I and III only
- (c) II and III only
- (d) III only

122. The Earth's equatorial region bulges outward, but the Earth flattens slightly towards the polar regions due to the :

- (a) Presence of a large oceanic mass in the southern hemisphere
- (b) Earth's rotational force
- (c) Earth's revolution
- (d) Greater gravitational force at the equator

123. In the southern hemisphere, trade winds blow from :

- (a) North-East to South-West
- (b) South-East to North-West
- (c) North-West to South-East
- (d) South-West to North-East

124. Consider the following statements regarding the structure of the atmosphere :

- I. The average height of the troposphere is higher nearer the poles than at the equator.
- II. The mesosphere contains the ozone layer.
- III. Radio waves transmitted from the Earth are reflected to the Earth by the ionosphere.
- IV. In the mesosphere, temperature decreases with an increase in altitude.

Which of the statements given above are correct ?

- (a) I and II only
- (b) II and III only
- (c) III and IV only
- (d) I, II, III and IV

125. Consider the following oceanic currents :

- I. Oyashio
- II. Canaries
- III. Labrador
- IV. Kuroshio
- V. Benguela
- VI. Alaska
- VII. Humboldt

How many of the above are Pacific Ocean currents ?

- (a) One
- (b) Two
- (c) Three
- (d) Four

126. Consider the following :

- I. Abrasion ✓
- II. Attrition ✓
- III. Hydraulic action ✓
- IV. Solution ✓

Which of the above are the main types of river erosion ?

- (a) I, II and III only
- (b) I, III and IV only
- (c) II and IV only
- (d) I, II, III and IV

127. A prolonged period of inadequate rainfall marked with mal-distribution of the same over time and space is known as :

- (a) Agricultural drought
- (b) Hydrological drought
- (c) Ecological drought
- (d) Meteorological drought ✓

128. Which group of landlocked states shares a boundary with Madhya Pradesh ?

- (a) Rajasthan, Uttar Pradesh, Chhattisgarh, Maharashtra and Gujarat only
- (b) Rajasthan, Uttar Pradesh, Jharkhand and Chhattisgarh only ✓
- (c) Rajasthan, Uttar Pradesh, Jharkhand, Chhattisgarh, Maharashtra and Gujarat
- (d) Rajasthan, Uttar Pradesh and Chhattisgarh only

129. Consider the following statements regarding the nature of rocks :

- I. Rocks are aggregates of one or more minerals.
- II. Granite is softer than soapstone. ✓
- III. Gabbro is black and quartzite can be milky white. ✓
- IV. Sedimentary rocks are related to foliation.

Which of the statements given above are **not** correct ?

- (a) I and II ✓
- (b) I and III ✓
- (c) II and IV
- (d) II and III ✓

130. The 'Agricultural Population Density' is referred to as the ratio of the :

- (a) Total population to Net cultivable land
- (b) Agricultural population to Gross cropped area
- (c) Total population to Total reported land
- (d) Total agricultural population to Net cultivable land ✓

131. The annual session of the Indian National Congress in December 1929 was held in :

- (a) Surat
(b) Lahore
(c) Amritsar
(d) Tripuri

132. Shortughai, a Harappan trading post in Afghanistan, was important to the Harappans for the possible supply of :

- (a) Conch shells
(b) Iron
(c) Copper
(d) Lapis lazuli and camel

133. Which of the following statements are correct regarding the demands of the protest movement known as Luddism (1811 - 17) ?

- I. A minimum wage for workers.
II. The right to form trade unions so that they could legally present their demands.
III. The use of machinery for efficient labour-saving production.

Select the answer using the code given below :

- (a) I and II only
(b) II and III only
(c) I and III only
(d) I, II and III

134. Consider the following statements regarding the Industrial Revolution in Britain :

- I. At the beginning of industrialization, coal and iron ore were plentifully available in Britain.
II. The blast furnace came into use at the beginning of the 18th century.
III. Britain was lucky in possessing excellent coking coal and high-grade iron ore in the same basins.

Which of the statements given above are correct ?

- (a) I and II only
(b) II and III only
(c) I and III only
(d) I, II and III

135. Which one of the following inscriptions records the history of a guild of silk weavers ?

- (a) The Hathigumpha inscription
(b) The Mandasor inscription
(c) The Kudumiyamalai inscription
(d) The Udayagiri Cave inscription

136. Match List I with List II :

List I (Event)	List II (Year)
I. Passing of the Age of Consent Bill	A. 1893
II. Establishment of the Arya Samaj	B. 1883
III. Death of Dayanand Saraswati	C. 1875
IV. Foundation of the Nagari Pracharini Sabha	D. 1891

Select the answer using the code given below :

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

137. Consider the following statements with regard to the types of land listed in the *Amarakosha*.

- I. Devamatrika refers to land watered by rain.
- II. Aprahata refers to fallow land. ✓
- III. Pankila refers to highly fertile land. ✓

Which of the statements given above is/are correct ?

- (a) I and II only
- (b) II only
- (c) I and III only
- (d) I, II and III ✓

138. Consider the following statements regarding the role of political parties in modern democracies :

- I. In most democracies, elections are fought mainly among the candidates put up by political parties. ✗
- II. Political parties put forward different policies and programmes and the voters choose from them. ✓
- III. Political parties shape public opinion. ✓

Which of the statements given above are correct ?

- (a) I and II only
- (b) II and III only
- (c) I and III only
- (d) I, II and III ✓

139. Consider the following statements with regard to the Lahore Session :

- I. The Congress decided to observe Independence Day on 26 January 1930. ✓
- II. It was decided to hoist the National Flag and sing patriotic songs at different venues. ✓
- III. Gandhiji suggested that the event be held synchronously in all the places. ✓

Which of the statements given above are correct ?

- (a) I and II only
- (b) II and III only
- (c) I and III only
- (d) I, II and III ✓

140. Consider the following statements :

- I. The Kailasanatha temple of Kanchi is the earliest Pallava temple hewn from solid rock.
- II. The Vaikuntha Perumal temple at Kanchi is a rare Pallava temple dedicated to Lord Vishnu.

Which of the statements given above is/are correct ?

- (a) I only
- (b) II only
- (c) Both I and II
- (d) Neither I nor II

141. Consider the following pairs with reference to the Constitution of India :

- I. Part V : The Union
- II. Part X : The Scheduled and Tribal Areas
- III. Part XII : Relations between the Union and the States
- IV. Part XIV : Amendment of the Constitution ✓

How many of the pairs given above are correctly matched ?

- (a) One
- (b) Two
- (c) Three
- (d) All four

142. With reference to the Panchsheel, which of the following is/are correct ?

- I. Mutual respect for territorial integrity and sovereignty
- II. Mutual non-interference
- III. Collective security against non-aggression ✗
- IV. Peaceful co-existence

Select the answer using the code given below :

- (a) I only
- (b) I, II and III
- (c) II, III and IV
- (d) I, II and IV

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143. Consider the following statements related to national integration :

- I. The expression of regional issues is not a part of democratic politics. ✗
- II. Nation-building is an ongoing process. ✓
- III. Regional imbalance is associated with India's development experience. ✓
- IV. Regions together form the nation. ✓

Which of the statements given above are correct ?

- (a) II, III and IV. ✓
- (b) I, II and IV ✗
- (c) III and IV only
- (d) II and III only

144. Consider the following statements regarding UN reforms :

- I. India demands an expanded Security Council.
- II. India does not support an increase in non-permanent members. ✗
- III. The majority of the UN General Assembly members are from developing countries. ✓

Which of the statements given above is/are correct ?

- (a) I only
- (b) II only
- (c) I and II
- (d) I and III

145. Which one of the following Five-Year Plan documents was titled as 'Towards Faster and More Inclusive Growth' ?

- (a) Eighth Plan
- (b) Ninth Plan
- (c) Tenth Plan
- (d) Eleventh Plan

146. Consider the following statements regarding the PESA Act, 1996 :

- I. Gram Sabhas have the power to declare Scheduled Areas.
- II. Gram Sabhas have the powers related to the management of community resources.
- III. The PESA applies to all States except areas under the Fifth Schedule.

Which of the statements given above is/are **not** correct ?

- (a) I and II
- (b) II and III
- (c) I and III
- (d) II only

147. Which one of the following is neither a constitutional nor a statutory body ?

- (a) Finance Commission
- (b) NITI Aayog
- (c) National Green Tribunal
- (d) Union Public Service Commission

148. Which one of the following committees recommended constitutional recognition for local bodies ?

- (a) K. Hanumanthaiah Committee
- (b) Veerappa Moily Committee
- (c) P.K. Thungon Committee
- (d) Kasturirangan Committee

149. The anti-defection provisions were incorporated in the Constitution through which one of the following Constitutional Amendments ?

- (a) 50th Amendment
- (b) 52nd Amendment
- (c) 58th Amendment
- (d) 61st Amendment

150. Consider the following statements regarding the Neighbourhood First Policy :

- I. India provides high-impact community development projects to Afghanistan.
- II. Bhutan is India's key maritime neighbour and vital partner in Vision MAHASAGAR.
- III. India launched Operation Brahma to provide relief following an earthquake in Myanmar.

Which of the statements given above are correct ?

- (a) I and II only
- (b) I and III only
- (c) II and III only
- (d) I, II and III