

YEAR OF ADVT: 2021

DATE OF EXAM: 21-JUNE-2025

Booklet Serial No.

10281

DO NOT BREAK THE SEAL OF THE BOOKLET UNTIL YOU ARE TOLD TO DO SO

## QUESTION BOOKLET

**SERIES : I**

**Subjects : English, General Knowledge, Mathematics  
and Science**

Full Marks : 250

Time Allowed : 2½ Hours

*Read the following instructions carefully before you begin to answer the questions.*

### INSTRUCTIONS TO CANDIDATES

1. This Booklet contains 125 questions to be answered in a separate OMR Answer Sheet using Black Ballpoint Pen in the following four Parts :

|                            |                |
|----------------------------|----------------|
| Part—A : English           | : 25 questions |
| Part—B : General Knowledge | : 25 questions |
| Part—C : Mathematics       | : 25 questions |
| Part—D : Science           | : 50 questions |

2. All questions are compulsory.  
3. You will be supplied the Answer Sheet separately by the Invigilator. You must complete the details of particulars asked for.  
4. Answers must be shown by completely blackening the corresponding circle in the Answer Sheet against the relevant question number by Black Ballpoint Pen. OMR Answer Sheet without marking Series shall not be evaluated.

**Example :**

Suppose the following question is asked :

**The Capital of Meghalaya is**

- (A) Guwahati  
(B) Kohima  
(C) Shillong  
(D) Delhi

You will have four alternatives in the Answer Sheet for your response corresponding to each question of the Question Booklet as below :

(A) (B) (C) (D)

In the above illustration, if your chosen response is alternative (C), i.e., Shillong, then the same should be marked on the Answer Sheet by blackening the relevant circle with a Black Ballpoint Pen only as below :

(A) (B) ● (D)

**The example shown above is the only correct method of answering.**

5. Answer the questions as quickly and as carefully as you can. Some questions may be difficult and others easy. Do not spend too much time on any one question.  
6. There will NOT be any negative marking for wrong answers.  
7. The Answer Sheet must be handed over to the Invigilator before you leave the Examination Hall.  
8. No Rough Work is to be done on the Answer Sheet. Space for Rough Work has been provided in the Question Booklet.

## PART—A : ENGLISH

( Marks : 50 )

Each question carries 2 marks

**Directions (Q. Nos. 1-5) :** In the following questions, a sentence has three parts [(A), (B) and (C)]. Find out which part of the sentence has an error and choose the option corresponding to it. If the sentence is free from error, choose (D) as your answer.

1. In today's modern age with /  
(A)  
technological advances, the opportunity /  
(B)  
to learn is seemingly everywhere. /  
(C)

No error  
(D)

2. Either he is / a complete fool or /  
(A) (B)  
he had lost his mind. / No error  
(C) (D)

3. Is there anything / greater than /  
(A) (B)  
love and compassion? / No error  
(C) (D)

4. She completed her /  
(A)  
assignment an went /  
(B)  
out for a walk. / No error  
(C) (D)

5. She had a courage /  
(A)  
to raise her voice / against injustice. /  
(B) (C)  
No error  
(D)

**Directions (Q. Nos. 6-10) :** Rearrange the parts of the sentence in correct order and mark the correct option from the given four alternatives.

6. The cooperative system

- P. a good way of encouraging  
Q. of doing business is  
R. ordinary workers to work hard

- (A) QPR (B) PQR  
(C) RPQ (D) QRP

7. Our body takes in many toxins from

- P. we eat, and we must have  
Q. a process for purging these impurities  
R. the atmosphere and the food

- (A) PQR (B) RPQ  
(C) QPR (D) RQP

8. Telecommunication includes

- P. transmit electronic signals  
Q. devices and systems that  
R. across long distances

- (A) RQP (B) PQR  
(C) QPR (D) PRQ



9. The moon is

- P. satellite and is its
  - Q. nearest neighbour in space
  - R. the earth's natural
- (A) RQP
- (B) QRP
- (C) PQR
- (D) RPQ

10. He is intelligent

- P. far more intelligent
  - Q. but his brother is
  - R. than he is
- (A) QPR
- (B) QRP
- (C) PRQ
- (D) RPQ

**Directions (Q. Nos. 11-15) : Read the passage given below and answer the questions that follow.**

In the past, man's worst enemy was Nature. He lived under the continual threat of famine and pestilence, a wet summer could bring death to a whole nation and every winter was a menace. Mountains stood like a barrier between people and people, a sea was less a highway than an impassable division.

Today Nature, though still an enemy, is an enemy almost completely conquered. Modern agriculture assures us of ample food supply. Modern transportation has made the resources of the entire planet accessible to all its inhabitants. Modern medicine and sanitation allow dense populations to cover the ground without risk of pestilence.

True, we are still at the mercy of the more violent natural convulsions. Against earthquake, flood and hurricane, man has, as yet, devised no adequate protection. At most times, Nature is no longer formidable, she has been subdued.

11. Modern medicine has helped man to

- (A) live longer everywhere in the world
- (B) live a healthy life in hygienic conditions
- (C) live in thickly populated areas without fear of epidemic
- (D) balance population with available resources

12. Man has yet succeeded in controlling the furies of

- (A) earthquakes
- (B) floods
- (C) hurricanes
- (D) All of the above

13. Which one of the following statements best reflects the underlying conviction of the passage?

- (A) Man can do wonders.
- (B) Man's knowledge has no end.
- (C) Man has been able to control Nature to a great extent.
- (D) Man has been able to control Nature completely.

14. In ancient times, man has an apprehension of

- (A) epidemics
- (B) severe droughts
- (C) floods
- (D) All of the above

15. The modern transport system is a blessing as it

- (A) has helped decrease the distance between towns and villages
- (B) has brought comfort to both towns and villages
- (C) has made all the commodities available to everyone
- (D) has encouraged people to travel for pleasure

**Directions (Q. Nos. 16–19) :** In the following passage there are blanks, each of which has been numbered. These numbers are printed below the passage and against each, four options are suggested, one of which fits the blank appropriately. Find out the appropriate word from the given options.

Positive thinking is an attitude or mindset characterized by (16) and happiness. A positive person hopes for the best and (17) success in his/her life. Although many may scoff at the (18) of staying positive all the time, it has a plethora of benefits not only for the mind but also for the body. Positivity brings happiness to the soul. It (19) our goodwill and joy.

16. (A) optimism (B) pessimism

(C) idealism (D) liberalism

17. (A) suspects (B) expects

(C) doubts (D) curse

18. (A) issue (B) doubt

(C) idea (D) neglect

19. (A) provokes (B) insults

(C) probe (D) evokes

**Directions (Q. Nos. 20–22) :** Out of the given four alternatives, choose the one which can be substituted for the given group of words.

**20.** The study of election trends

- (A) Philology
- (B) Psychology
- (C) Paleontology
- (D) Psephology

**21.** One who is a boot licker; flatterer

- (A) Pariah
- (B) Sycophant
- (C) Vagrant
- (D) Fugitive

**22.** An intelligentsia that develops new or experimental concepts especially in the arts

- (A) Avant-garde
- (B) Bohemian
- (C) Squad
- (D) Orthodox

**Directions (Q. Nos. 23–25) :** In the following questions, four alternatives are given for idioms and phrases. Choose the one that best expresses the meaning of the given idiom/phrase.

**23.** To rise like a phoenix

- (A) To rise at dawn
- (B) To rise with a new life
- (C) To rise with anger
- (D) To get up with a start

**24.** Break a leg

- (A) Good luck
- (B) Bad luck
- (C) A problem
- (D) Expensive item

**25.** At the eleventh hour

- (A) On time
- (B) To leave
- (C) To stop working
- (D) At the last moment

## PART—B : GENERAL KNOWLEDGE

( Marks : 50 )

Each question carries 2 marks

26. Which country won the Sultan of Johor Cup title in 2023?

- (A) India
- (B) Pakistan
- (C) Germany
- (D) Australia

27. Which of the following diseases is **not** caused by bacteria?

- (A) Diphtheria
- (B) Plague
- (C) Pneumonia
- (D) Dengue

28. Which of the following is the auto-biography of A. P. J. Abdul Kalam?

- (A) *My Truth*
- (B) *Wings of Fire*
- (C) *The Story of My Life*
- (D) None of the above

29. Match List-I with List-II and select the correct answer using the codes given below :

List-I

List-II

- |                       |              |
|-----------------------|--------------|
| a. Technical knockout | 1. Billiards |
| b. Cue                | 2. Boxing    |
| c. Time trial         | 3. Polo      |
| d. Chukker            | 4. Cycling   |

Codes :

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

30. Which of the following is **not** a SAARC country?

- |              |              |
|--------------|--------------|
| (A) India    | (B) China    |
| (C) Pakistan | (D) Maldives |

31. Which G20 member country is known for its 'Belt and Road Initiative'?

- |           |                  |
|-----------|------------------|
| (A) India | (B) Russia       |
| (C) China | (D) South Africa |



- 32.** National Sports Day, 2023 in India is celebrated
- (A) to comply with the NEP, 2020
  - (B) towards the legacy of Major Dhyan Chand
  - (C) to introduce the importance of sports in India
  - (D) for the legacy of P. T. Usha
- 33.** \_\_\_\_\_ developed the first successful vaccine in 1950.
- (A) James Simpson
  - (B) Robert Edwards
  - (C) H. Gibbon
  - (D) Jonas Salk
- 34.** The first Indian who received the prestigious Harvard Medal is
- (A) Mukesh Ambani
  - (B) Ratan Tata
  - (C) Anand Mahindra
  - (D) Azim Premji
- 35.** The headquarters of South Asian Association for Regional Cooperation (SAARC) is located in
- (A) Kathmandu, Nepal
  - (B) New Delhi, India
  - (C) Colombo, Sri Lanka
  - (D) Dhaka, Bangladesh
- 36.** The full form of FSSAI is
- (A) Food Standards and Safety Authority of India
  - (B) Food Safety and Standards Authority of India
  - (C) Food Security and Safety Authority of India
  - (D) Food Safety and Security Authority of India
- 37.** \_\_\_\_\_ was the first woman to go into the space.
- (A) Valentina Tereshkova
  - (B) Kalpana Chawla
  - (C) Sally Ride
  - (D) Susan Helms

38. Which Union Ministry is associated with the National Action Plan for Drug Demand Reduction (NAPDDR)?

- (A) Ministry of Youth Affairs and Sports
- (B) Ministry of Education
- (C) Ministry of Social Justice and Empowerment
- (D) Ministry of Health and Family Welfare

39. Which day is celebrated as the International Day for the Elimination of Violence against Women?

- (A) 26th November
- (B) 18th December
- (C) 16th April
- (D) 25th November

40. Which State launched a seven-month ecotourism session for tiger reserves and wildlife sanctuaries for 2023-24?

- (A) Rajasthan
- (B) Madhya Pradesh
- (C) Uttar Pradesh
- (D) Tamil Nadu

41. Triton is the largest moon of which planet?

- (A) Uranus
- (B) Jupiter
- (C) Neptune
- (D) Saturn

42. \_\_\_\_\_ was considered as the most polluted country in the world in 2023.

- (A) India
- (B) Pakistan
- (C) Burkina Faso
- (D) Bangladesh

43. Which of the following is **not** associated with the Karakoram Range?

- (A) Khurdaplo
- (B) LoLofond
- (C) Yarkand Rimo
- (D) Gangotri



44. Which of the following is an inland riverine port?
- (A) Kolkata
  - (B) Chennai
  - (C) Thiruvananthapuram
  - (D) Mumbai
45. NASA was established in which year?
- (A) 1958
  - (B) 1969
  - (C) 1978
  - (D) 1987
46. Elon Musk started SpaceX in
- (A) 2002
  - (B) 2008
  - (C) 2012
  - (D) 2023
47. Who was the founder of the Durand Cup?
- (A) Ebenezer Cobb Morley
  - (B) Walter Chauncey Camp
  - (C) Sir Henry Mortimer
  - (D) Nagendra Prasad Sarbadhikari
48. The concept of a Five-Year Plan in the Constitution of India is borrowed from which country?
- (A) England
  - (B) Russia
  - (C) The USA
  - (D) Germany
49. 'Golden Revolution' is related to
- (A) corruption free
  - (B) prosperity
  - (C) horticulture and honey
  - (D) precious materials
50. Which country will host the 17th BRICS Summit, 2025?
- (A) Russia
  - (B) China
  - (C) India
  - (D) Brazil

## PART—C : MATHEMATICS

( Marks : 50 )

Each question carries 2 marks

51. A car travels 432 km on 48 litres of petrol. How far would it travel on 20 litres of petrol?
- (A) 160 km  
(B) 170 km  
(C) 180 km  
(D) 190 km
52. A train covers 95 kilometres in  $1\frac{1}{4}$  hours. Assuming that the speed of the train remains uniform, the time required to cover a distance of 266 km is
- (A) 3 hours 30 minutes  
(B) 3 hours 50 minutes  
(C) 2 hours 30 minutes  
(D) 2 hours 50 minutes
53. In a hostel of 50 girls, there are food provisions for 40 days. If 30 more girls join the hostel, then how long will these provisions last?
- (A) 20 days  
(B) 25 days  
(C) 30 days  
(D) 35 days
54. Temperature remaining constant, the volume of a gas varies inversely as the pressure. If the volume of the gas at pressure 270 mm is 840 cu. cm, then find the volume of the gas at pressure 315 mm, assuming that the temperature remains constant throughout the experiment.
- (A) 700 cu. cm  
(B) 705 cu. cm  
(C) 710 cu. cm  
(D) 720 cu. cm
55. In an examination, Rohit secured 434 marks. If he secured 62% marks, the maximum marks is
- (A) 650  
(B) 680  
(C) 700  
(D) 800
56. John purchased a home for ₹4,52,000 and spent ₹28,000 on its repairs. He had to sell it for ₹4,68,000. The profit or loss percent is
- (A) 2.5%  
(B) 1.5%  
(C) 2%  
(D) None of the above

57. How many days will 1648 persons take to construct a bridge if 721 persons can build the same bridge in 48 days?

- (A) 21 days
- (B) 23 days
- (C) 25 days
- (D) 24 days

58. In how many years will ₹250 invested at the rate of 8% per annum simple interest amount to ₹330?

- (A)  $3\frac{1}{2}$  years
- (B) 4 years
- (C)  $4\frac{1}{2}$  years
- (D) 5 years

59. The sum of two numbers is 52. If one of the numbers is 10 more than the other number, then the numbers are

- (A) 23, 33
- (B) 21, 31
- (C) 25, 35
- (D) 28, 37

60. I have some ₹5 coins and some ₹2 coins. The number of ₹2 coins is 4 times that of ₹5 coins. If I have ₹117 in all, the number of ₹5 coins is

- (A) 9
- (B) 36
- (C) 12
- (D) None of the above

61. The sum of three consecutive integers is 24. The integers are

- (A) 7, 8, 9
- (B) 6, 7, 8
- (C) 8, 9, 10
- (D) None of the above

62. In a class of 35 students, the number of girls is  $\frac{2}{5}$  of the boys. The number of boys in the class is

- (A) 10
- (B) 15
- (C) 20
- (D) 25



63. Subramaniam has three boxes of different fruits. Box A weighs  $2\frac{1}{2}$  kg more than box B and box C weighs  $10\frac{1}{4}$  kg more than box B. If the total weight of the three boxes is  $48\frac{3}{4}$  kg, then the weight of box A is
- (A) 10 kg  
(B) 13.5 kg  
(C) 14.5 kg  
(D) 15 kg
64. Sarita and Julie start walking from the same place in the opposite directions. If Julie walks at a speed of  $2\frac{1}{2}$  km/hr and Sarita at a speed of 2 km/hr, in how much time will they be 18 km apart?
- (A)  $2\frac{1}{2}$  hours  
(B) 4 hours  
(C) 3 hours  
(D) 8 hours
65. In  $\triangle ABC$ ,  $\angle A = 90^\circ$ ,  $AB = 5$  cm and  $AC = 12$  cm. If  $AD \perp BC$ , then  $AD$  is
- (A)  $\frac{13}{2}$  cm  
(B)  $\frac{15}{2}$  cm  
(C)  $\frac{45}{13}$  cm  
(D)  $\frac{60}{13}$  cm
66. In a rhombus of side 10 cm, one of the diagonals is 12 cm long. The length of the second diagonal is
- (A) 10 cm  
(B) 11 cm  
(C) 16 cm  
(D) 12 cm
67. 6 pipes are required to fill a tank in 1 hour 20 minutes. How long will it take if only 5 pipes of the same type are used?
- (A) 1 hour 20 minutes  
(B) 1 hour 25 minutes  
(C) 1 hour 30 minutes  
(D) 1 hour 36 minutes
68. If the probability of occurrence of an event is denoted by  $P(E)$  and the probability that the event will not occur is denoted by  $P(\bar{E})$ , and  $P(E) = 0.05$ , then  $P(\bar{E})$  is equal to
- (A) 0.75  
(B) 0.95  
(C) 1.05  
(D) 0.85

**69.** The HCF of two numbers is 16 and their product is 3072. The LCM of the numbers is

(A) 182

(B) 192

(C) 212

(D) None of the above

**70.** The sum of two numbers is 137 and their difference is 43. The numbers are

(A) 90, 47

(B) 94, 43

(C) 77, 60

(D) 67, 70

**71.** A two-digit number is such that the product of the digits is 15. If 18 is added to the number, the digits interchange. The number is

(A) 25

(B) 35

(C) 45

(D) 53

**72.** The perimeter of a semi-circular protractor is 36 cm. Its diameter is

(A) 10 cm

(B) 12 cm

(C) 14 cm

(D) 15 cm

**73.** The area of a circle is  $154 \text{ cm}^2$ . Then the circumference of the circle is

(A) 22 cm

(B) 33 cm

(C) 40 cm

(D) 44 cm

**74.** The circumference of a circle is 39.6 cm. Its radius is

(A) 2.3 cm

(B) 4.3 cm

(C) 5.3 cm

(D) 6.3 cm

**75.** A plane is observed to be approaching the airport. It is at a distance of 12 km from the point of observation such that the angle of elevation of the plane is  $45^\circ$ . The height of the plane above the ground is

(A)  $6\sqrt{2}$  km

(B)  $5\sqrt{2}$  km

(C)  $4\sqrt{2}$  km

(D) None of the above

## PART—D : SCIENCE

( Marks : 100 )

Each question carries 2 marks

76. During microsporogenesis, meiosis occurs in
- (A) endothecium
  - (B) microspore mother cells
  - (C) microspore tetrads
  - (D) pollen grains
77. Which of the following hormones is **not** secreted by human placenta?
- (A) hCG
  - (B) Estrogen
  - (C) Progesterone
  - (D) LH
78. ZZ/ZW type of sex determination is seen in
- (A) platypus
  - (B) snail
  - (C) cockroach
  - (D) peacock
79. Mendel's law of independent assortment holds good for genes located on the
- (A) non-homologous chromosomes
  - (B) homologous chromosomes
  - (C) extranuclear genetic element
  - (D) same chromosome
80. Which of the following represents a pair of contrasting characters?
- (A) Allele (or allelomorphs)
  - (B) Phenotype
  - (C) Homozygous
  - (D) Heterozygous
81. The net electric charge on DNA and histones is
- (A) both positive
  - (B) both negative
  - (C) negative and positive respectively
  - (D) zero
82. If the sequence of nitrogen bases of the coding strand of DNA in a transcription unit is 5'-ATGAATG-3', then the sequence of bases in its RNA transcript would be
- (A) 5'-AUGAAUG-3'
  - (B) 5'-UACUUAC-3'
  - (C) 5'-CAUUCAU-3'
  - (D) 5'-GUAAGUA-3'



83. Viviparity is considered to be more evolved because

- (A) the young ones are left on their own
- (B) the young ones are protected by a thick shell
- (C) the young ones are protected inside the mother's body and are looked after, after they are born
- (D) the embryo takes a long time to develop

84. An intestinal parasite which causes blockage of the intestinal passage and whose eggs are excreted along with the faeces of the infected person is

- (A) *Wuchereria bancrofti*
- (B) *Ascaris*
- (C) *Epidermophyton*
- (D) *Microsporum*

85. Which of the following cells actively participate during allergy?

- (A) B lymphocytes
- (B) Liver cells
- (C) Mast cells
- (D) Red blood cells

86. Which of the following is **not** a characteristic of the plasmids?

- (A) Extranuclear
- (B) Single-stranded
- (C) Independent replication
- (D) Circular

87. DNA fragments generated by the restriction endonuclease in a chemical reaction can be separated by

- (A) gel electrophoresis
- (B) restriction mapping
- (C) centrifugation
- (D) PCR

88. Golden rice is

- (A) a variety of rice that is grown along the Yellow River in China
- (B) long-stored rice having yellow-coloured tint
- (C) a transgenic rice having gene for  $\beta$ -carotene
- (D) a wild variety of rice with yellow-coloured grains

89. Ecological niche is
- (A) the surface area of the ocean
  - (B) an ecologically adapted zone
  - (C) the physical position and functional role of a species within the community
  - (D) the forms of all plants and animals living at the bottom of the lake
90. According to Allen's rule, the mammals from colder climates have
- (A) shorter ears and longer limbs
  - (B) longer ears and shorter limbs
  - (C) longer ears and longer limbs
  - (D) shorter ears and shorter limbs
91. An inverted pyramid of biomass can be found in which ecosystem?
- (A) Forest
  - (B) Marine
  - (C) Grassland
  - (D) Tundra
92. Of the total amount of energy that passes from one trophic level to another, about 10% is
- (A) respired and becomes heat
  - (B) passed out as faeces or urine
  - (C) stored as body tissue
  - (D) recycled to autotrophs
93. Which of the following countries has the highest biodiversity?
- (A) South America
  - (B) South Africa
  - (C) Russia
  - (D) India
94. Where among the following will you find pitcher plant?
- (A) Rainforest of North-East India
  - (B) Sunderbans
  - (C) Thar Desert
  - (D) Western Ghats
95. Which of the following forests is known as the lungs of the planet earth?
- (A) Taiga forest
  - (B) Tundra forest
  - (C) Amazon rainforest
  - (D) Rainforest of North-East India

96. Colligative properties depend on the
- nature of the solute
  - number of particles of the solute
  - number of particles of the solvent
  - nature of the solvent
97. Low concentration of oxygen in the blood and tissues of people living at high altitude is due to
- low temperature
  - low atmospheric pressure
  - high atmospheric pressure
  - both low temperature and high atmospheric pressure
98. Molar conductivity of ionic solution depends on
- temperature
  - distance between electrodes
  - nature of electrodes
  - surface area of electrodes
99. In the presence of a catalyst, the heat evolved or absorbed during the reaction
- increases
  - decreases
  - remains unchanged
  - may increase or decrease
100. The value of rate constant of a pseudo-first-order reaction
- depends on the concentration of reactants present in small amount
  - depends on the concentration of reactants present in excess
  - is independent of the concentration of reactants
  - depends only on temperature
101. Which of the following elements does **not** show variable oxidation state?
- Sc
  - V
  - Fe
  - Hg
102. Which of the following is colourless in aqueous solution?
- $\text{Fe}^{2+}$
  - $\text{Mn}^{2+}$
  - $\text{Ti}^{3+}$
  - $\text{Sc}^{3+}$



103. An example of ambidentate ligand is

- (A) ammino
- (B) aquo
- (C) oxalato
- (D) thiocyanato

104. Which one of the following has an optical isomer?

- (A)  $[\text{Co}(\text{H}_2\text{O})_4(\text{en})]^{3+}$
- (B)  $[\text{Zn}(\text{en})_2]^{2+}$
- (C)  $[\text{Zn}(\text{en})(\text{NH}_3)_2]^{2+}$
- (D)  $[\text{Co}(\text{en})_3]^{3+}$

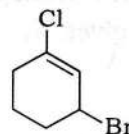
105. The oxidation state of nickel in  $[\text{Ni}(\text{CO})_4]$  is

- (A) 4
- (B) 0
- (C) 2
- (D) 3

106. Which of the following compounds has the highest boiling point?

- (A)  $\text{CH}_3\text{CH}_2\text{CH}_2\text{Cl}$
- (B)  $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{Cl}$
- (C)  $\text{CH}_3\text{CH}(\text{CH}_3)\text{CH}_2\text{Cl}$
- (D)  $(\text{CH}_3)_3\text{CCl}$

107. The IUPAC name of the compound shown below is



- (A) 2-bromo-6-chlorohex-1-ene
- (B) 6-bromo-2-chlorocyclohexene
- (C) 3-bromo-1-chlorocyclohexene
- (D) 1-bromo-3-chlorocyclohexene

108. In one step, ethyne can be obtained from

- (A) ethanol
- (B) methanol
- (C) chloroform
- (D) ethyl bromide

109.  $\text{CH}_3\text{CH}_2\text{OH}$  can be converted into  $\text{CH}_3\text{CHO}$  by

- (A) catalytic hydrogenation
- (B) treatment with  $\text{LiAlH}_4$
- (C) treatment with pyridinium chlorochromate
- (D) treatment with  $\text{KMnO}_4$

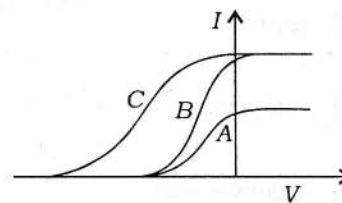
110. Glucose when reduced with HI and red phosphorus gives

- (A) *n*-hexane
- (B) *n*-heptane
- (C) *n*-pentane
- (D) *n*-octane

111. The bridges are declared unsafe after long use due to

- (A) its losing elastic strength
- (B) its losing plastic strength
- (C) its gaining shear stress
- (D) its gaining shear strain

112. In a photoelectric experiment, plate current is plotted against anode potential as shown in the following figure :



Which of the following is correct?

- (A) A and B will have same intensities while B and C will have different frequencies
- (B) B and C will have different intensities while A and B will have different frequencies
- (C) A and B will have different intensities while B and C will have equal frequencies
- (D) B and C will have equal intensities while A and B will have same frequencies

113. The diffraction effect can be observed in

- (A) sound waves only
- (B) ultrasonic waves only
- (C) light waves only
- (D) sound waves as well as light waves

**114.** Lens generally used in magnifying glass is

- (A) single concave lens
- (B) single convex lens
- (C) combination of convex lens of lower power and concave lens of lower focal length
- (D) plano-concave lens

**115.** If a copper wire is stretched to make its radius decreased by 0.1%, then the percentage change in its resistance is approximately

- (A) -0.4%
- (B) +0.8%
- (C) +0.4%
- (D) +0.2%

**116.** The minimum energy required to remove an electron from a substance is called its

- (A) work function
- (B) kinetic energy
- (C) stopping potential
- (D) potential energy

**117.** The basic reason for the extraordinary sparkle of suitably cut diamond is that

- (A) it has low refractive index
- (B) it has high transparency
- (C) it has high refractive index
- (D) it is very hard

**118.** Escape velocity of a body on the surface of a planet does **not** depend on

- (A) mass of the planet
- (B) radius of the planet
- (C) mass of the body
- (D) gravitational constant

**119.** For a body moving with constant speed in a horizontal circle, which of the following remains constant?

- (A) Velocity
- (B) Acceleration
- (C) Centripetal force
- (D) Kinetic energy

**120.** Propagation of sound in air is

- (A) adiabatic
- (B) isochoric
- (C) isothermal
- (D) isobaric



121. The total energy of the electron in an orbit of hydrogen atom is

- (A) zero
- (B) negative
- (C) positive
- (D)  $2e$  ( $e$  is the charge of the electron)

122. Optical fibre works on the principle of

- (A) refraction
- (B) dispersion
- (C) total internal reflection
- (D) polarization

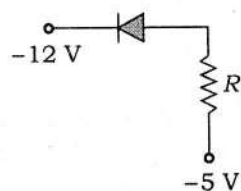
123. Which of the following is **not** conserved in inelastic collision?

- (A) Momentum
- (B) Kinetic energy
- (C) Both momentum and kinetic energy
- (D) Neither momentum nor kinetic energy

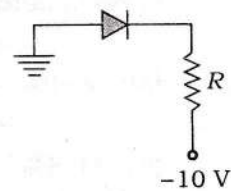
124. The value of  $G$  on the surface of the earth is  $6.67 \times 10^{-11} \text{ N m}^2 \text{ kg}^{-2}$ . What is its value on the surface of the moon?

- (A) 1/6th that on the surface of the earth
- (B) Zero
- (C) Same
- (D)  $2G$

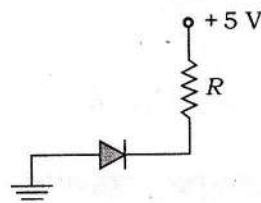
125. In which of the following figures, the  $p$ - $n$  diode is reverse biased?



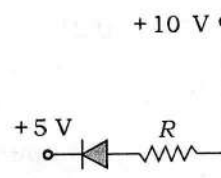
(i)



(ii)



(iii)



(iv)

- (A) (i), (ii) and (iii)
- (B) (iii) and (iv)
- (C) Only (iii)
- (D) Only (ii)