

**PRE-MEDICAL : ENTHUSIAST, LEADER & ACHIEVER COURSE PHASE - ALL PHASE**

Test Booklet Code

This Booklet contains 28 pages.

**L14**

Do not open this Test Booklet until you are asked to do so.

**Important Instructions :**

1. The Answer Sheet is inside this Test Booklet. When you are directed to open the Test Booklet, take out the Answer Sheet and fill in the particulars on ORIGINAL Copy carefully with **blue/black** ball point pen only.
2. The test is of **3 hours 20 minutes** duration and the Test Booklet contains **200** multiple-choice questions (four options with a single correct answer) from **Physics, Chemistry and Biology (Botany and Zoology)**. **50** questions in each subject are divided into **two Sections (A and B)** as per details given below :
  - (a) **Section A** shall consist of **35 (Thirty-five)** Questions in each subject (Question Nos - 1 to 35, 51 to 85, 101 to 135 and 151 to 185). All questions are compulsory.
  - (b) **Section B** shall consist of **15 (Fifteen)** questions in each subject (Question Nos - 36 to 50, 86 to 100, 136 to 150 and 186 to 200). In Section B, a candidate needs to **attempt any 10 (Ten)** questions out of **15 (Fifteen)** in each subject.  
**Candidates are advised to read all 15 questions in each subject of Section B** before they start attempting the question paper. In the event of a candidate attempting more than ten questions, **the first ten questions answered by the candidate shall be evaluated.**
3. Each question carries **4** marks. For each correct response, the candidate will get **4** marks. For each incorrect response, **one mark** will be deducted from the total scores. **The maximum marks are 720.**
4. Use **Blue/Black Ball Point Pen only** for writing particulars on this page/marking responses on Answer Sheet.
5. Rough work is to be done in the space provided for this purpose in the Test Booklet only.
6. On completion of the test, the candidate **must hand over the Answer Sheet (ORIGINAL and OFFICE Copy) to the Invigilator** before leaving the Room/Hall. The candidates are allowed to take away this Test Booklet with them.
7. The candidates should ensure that the Answer Sheet is not folded. Do not make any stray marks on the Answer Sheet. Do not write your Form No. anywhere else except in the specified space in the Test Booklet/Answer Sheet.
8. Use of white fluid for correction is **NOT** permissible on the Answer Sheet.
9. Each candidate must show on-demand his/her Allen ID Card to the Invigilator.
10. No candidate, without special permission of the Invigilator, would leave his/her seat.
11. The candidates should not leave the Examination Hall without handing over their Answer Sheet to the Invigilator on duty and sign (with time) the Attendance Sheet **twice**. **Cases, where a candidate has not signed the Attendance Sheet second time, will be deemed not to have handed over the Answer Sheet and dealt with as an Unfair Means case.**
12. Use of Electronic/Manual Calculator is prohibited.
13. The candidates are governed by all Rules and Regulations of the examination with regard to their conduct in the Examination Room/Hall. All cases of unfair means will be dealt with as per the Rules and Regulations of this examination.
14. **No part of the Test Booklet and Answer Sheet shall be detached under any circumstances.**
15. The candidates will write the Correct Test Booklet Code as given in the Test Booklet/Answer Sheet in the Attendance Sheet.
16. Compensatory time of one hour five minutes will be provided for the examination of three hours and 20 minutes duration, whether such candidate (having a physical limitation to write) uses the facility of scribe or not.

Name of the Candidate (in Capitals) : \_\_\_\_\_

Form Number : in figures \_\_\_\_\_

: in words \_\_\_\_\_

Centre of Examination (in Capitals) : \_\_\_\_\_

Candidate's Signature : \_\_\_\_\_ Invigilator's Signature : \_\_\_\_\_

**Your Target is to secure Good Rank in Pre-Medical 2024**

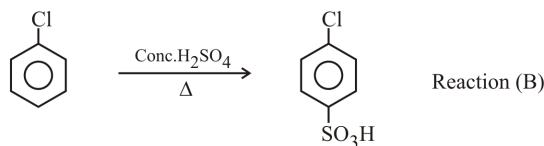
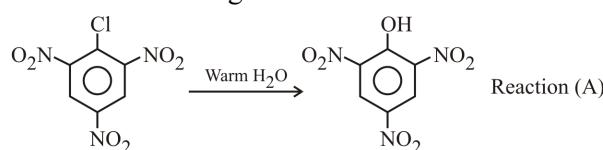
**SECTION-A ( CHEMISTRY )**

1. **Assertion (A) :-** 1-Propanol have higher boiling point than methoxyethane.

**Reason (R) :-** Both have intermolecular hydrogen bonding but 1-propanol have strong hydrogen bonding.

- Both assertion and reason are true and reason is correct explanation of assertion.
- Both assertion and reason are true but reason is not correct explanation of assertion
- Assertion is true but reason is false.
- Assertion and reason both are false.

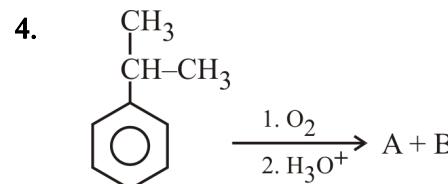
2. Consider following reaction :-



Find correct statement :-

- Both reaction are example of substitution reaction
  - Reaction A is electrophilic substitution reaction
  - Reaction B is nucleophilic substitution reaction
  - All are correct
3. Which product gives instant reaction with Lucas reagent :-

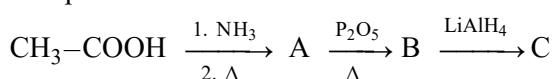
- $\text{HCHO} \xrightarrow[2. \text{H}_3\text{O}^+]{1. \text{CH}_3\text{MgBr}} \text{Product}$
- $\text{CH}_3\text{-CHO} \xrightarrow[2. \text{H}_3\text{O}^+]{1. \text{CH}_3\text{MgBr}} \text{Product}$
- $\text{CH}_3\text{-C}(=\text{O})\text{-CH}_3 \xrightarrow[2. \text{H}_3\text{O}^+]{1. \text{CH}_3\text{MgBr}} \text{Product}$
- $\text{CH}_3\text{-CHO} \xrightarrow[2. \text{H}_3\text{O}^+]{1. (\text{CH}_3)_2\text{CH-MgBr}} \text{Product}$



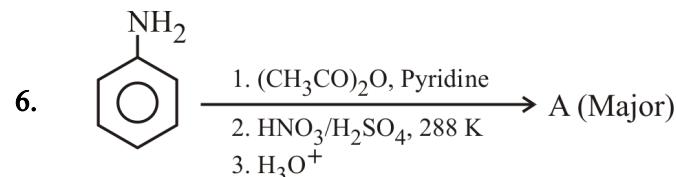
A and B can't be distinguished by :-

- Neutral  $\text{FeCl}_3$  test
- 2,4-DNP test
- Bromine water test
- Tollen's test

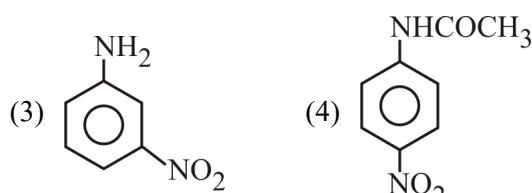
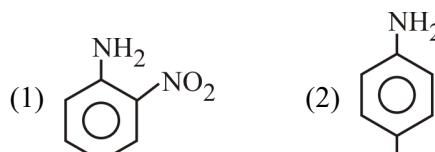
5. End product "C" is :-



- $\text{CH}_3\text{-CH}_2\text{-Cl}$
- $\text{CH}_3\text{CH}_2\text{NH}_2$
- $\text{CH}_3\text{-C}\equiv\text{N}$
- $\text{CH}_3\text{CONH}_2$



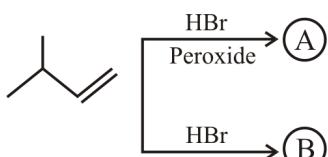
A is :-



7. Ascorbic acid is :-

- Vitamin A
- Vitamin B
- Vitamin C
- Vitamin D

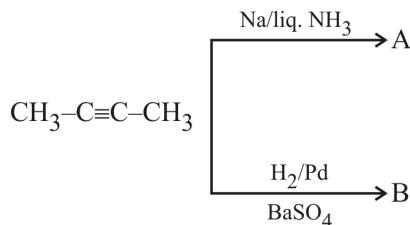
8.



Product A & B respectively are :-

- (1) ,
- (2) ,
- (3) ,
- (4) ,

9.

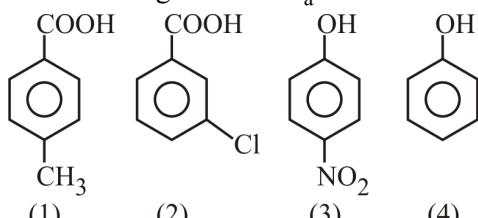


A & B respectively are :-

- (1) ,
- (2) ,
- (3) ,
- (4) ,

10.

Correct decreasing order of  $K_a$  :-



- (1)  $2 > 3 > 4 > 1$
- (2)  $2 > 3 > 1 > 4$
- (3)  $2 > 1 > 3 > 4$
- (4)  $2 > 1 > 4 > 3$

3

11. Which of the following is

1-Chloro-2,2-dimethylpropane :-

- (1)
- (2)
- (3)
- (4)

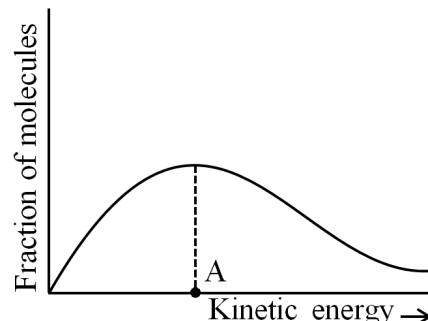
12.

Which of the following will give Lassaigne's test :-

- (1)  $\text{CH}_3-\text{CH}_2-\text{NH}_2$
- (2)  $\text{CH}_3-\text{CH}_2-\text{Cl}$
- (3)  $\text{CH}_3-\text{CH}_2-\text{SH}$
- (4) All of these

13.

In the following curve, point A represent :-



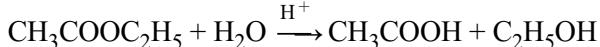
- (1) Energy of activation

- (2) Most probable kinetic energy

- (3) Energy of activated complex

- (4) Total number of molecules

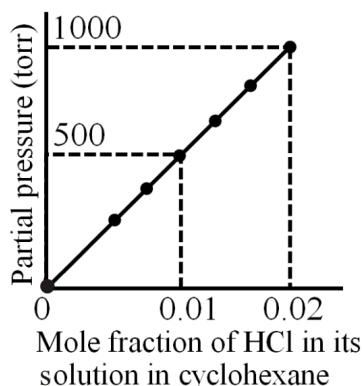
14.



In the above reaction if water is not taken in large excess amount as compared to ethyl acetate then order of reaction is :-

- (1) Zero order
- (2) First order
- (3) Second order
- (4) Third order

15. If we draw a graph between partial pressure of HCl gas versus mole fraction of the gas in solution, then we get following graph :-



The Henry's law constant,  $K_H$  is -

- (1)  $5 \times 10^4$  torr
  - (2)  $10^4$  torr
  - (3)  $10^{-4}$  torr
  - (4)  $2 \times 10^{-5}$  torr
16. When there is dissociation of solute into ions, then experimentally determined molar mass is -
- (1) Always half of its true value.
  - (2) Always greater than the true value.
  - (3) Always equal to the true value
  - (4) Always lower than the true value.
17. **Assertion (A)** : It is possible to calculate  $\Lambda_m^o$  of electrolyte from the  $\Lambda_m^o$  of individual ions only for strong electrolyte.  
**Reason (R)** : For weak electrolytes, it is possible to determine the value of its dissociation constant once we know the  $\Lambda_m^o$  and  $\Lambda_m$  at a given concentration C.
- (1) Both Assertion and Reason are correct and Reason is correct explanation of Assertion.
  - (2) Both Assertion and Reason are correct but Reason is not correct explanation of Assertion.
  - (3) Assertion is correct but Reason is incorrect.
  - (4) Assertion is incorrect but Reason is correct.

18. Given below are two statements :-

**Statement-I** : Always read the lower meniscus for recording the burette reading in the case of all coloured solutions.

**Statement-II** : We should heat the mixture of oxalic acid and  $H_2SO_4$  solution upto  $50-60^\circ C$  while titrating it against potassium permanganate.

- (1) Statement-I is true but Statement-II is false.
- (2) Statement-I is false but Statement-II is true.
- (3) Both Statement-I and Statement-II are true.
- (4) Both Statement-I and Statement-II are false.

19. Which of the following series of transition in the spectrum of hydrogen atom falls in ultra violet region ?

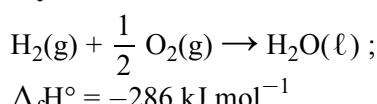
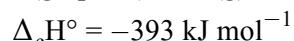
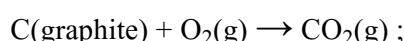
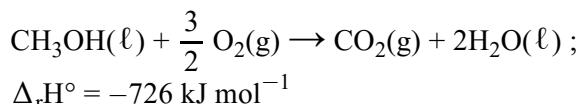
- (1) Lyman series
- (2) Balmer series
- (3) Paschen series
- (4) Brackett series

20. **Assertion** : If the value of  $K_C$  for the reaction  $N_2 + O_2 \rightleftharpoons 2NO$  is 100 then the value of  $K_C$  for the reaction  $2NO \rightleftharpoons N_2 + O_2$  is 0.01.

**Reason** : The equilibrium constant for the reverse reaction is equal to the inverse of the equilibrium constant for the forward reaction.

- (1) Both Assertion and Reason are correct and Reason is correct explanation of Assertion.
- (2) Both Assertion and Reason are correct but Reason is not correct explanation of Assertion.
- (3) Assertion is correct but Reason is incorrect.
- (4) Assertion is incorrect but Reason is correct.

21. Calculate the standard enthalpy of formation of  $\text{CH}_3\text{OH}(\ell)$  from the following data :



(1)  $+47 \text{ kJ mol}^{-1}$

(2)  $-239 \text{ kJ mol}^{-1}$

(3)  $+239 \text{ kJ mol}^{-1}$

(4)  $-47 \text{ kJ mol}^{-1}$

22. The pair of compounds that can work both as an oxidising as well as reducing agent is :

- (i)  $\text{SO}_2$  (ii)  $\text{H}_3\text{PO}_3$  (iii)  $\text{NH}_3$  (iv)  $\text{HNO}_3$

(1) (i) and (iii) (2) (ii) and (iii)

(3) (i) and (ii) (4) (iii) and (iv)

23. The maximum number of atoms are present in :-

(1) 5.6 L of  $\text{CO}_2(\text{g})$  at STP

(2) 0.5 g of  $\text{H}_2(\text{g})$

(3) 18 mL of water ( $d = 1 \text{ g/mL}$ )

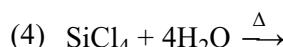
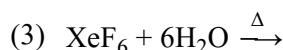
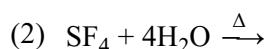
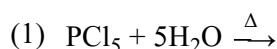
(4) 16 g of  $\text{O}_3$

24. Which of the following ions does not have S-S linkage :-

(1)  $\text{S}_2\text{O}_6^{2-}$  (2)  $\text{S}_2\text{O}_5^{2-}$

(3)  $\text{S}_2\text{O}_8^{2-}$  (4)  $\text{S}_2\text{O}_3^{2-}$

25. In which of the following reaction hybridisation of central atom does not change :-



26. **Assertion (A) :-** Mo (VI) and W (VI) are found to be more stable than Cr (VI).

**Reason (R) :-** Cr(VI) in the form of dichromate in acidic medium act as a strong reducing agent.

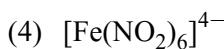
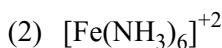
(1) A and R are both true but R is not correct explanation of A.

(2) A is true but R is false.

(3) A is false but R is true.

(4) A and R are both true and R is the correct explanation of A.

27. In which of the following complex have splitting energy ( $\Delta$ ) < pairing energy (P) :-



28. Match the column :-

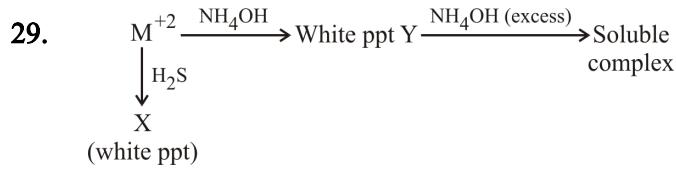
|     | Chemical Reaction   |     | Property of product         |
|-----|---|-----|-----------------------------|
| (a) | $\text{CuSO}_4 + \text{NH}_4\text{OH}$ (excess) $\rightarrow$ | (P) | Square planar               |
| (b) | $\text{HgCl}_2 + \text{KI}$ (excess) $\rightarrow$            | (Q) | $\text{sp}^3$ hybridisation |
| (c) | $\text{ZnSO}_4 + \text{NH}_4\text{OH}$ (excess) $\rightarrow$ | (R) | Diamagnetic                 |
| (d) | $\text{NiSO}_4 + \text{dmg}$ $\rightarrow$                    | (S) | Dark red ppt                |

(1) a-P ; b-R ; c-S ; d-P,R

(2) a-R,S ; b-P,R ; c-R,S ; d-Q,S

(3) a-P ; b-Q,R ; c-Q,R ; d-P,R,S

(4) a-R,R ; b-Q,R ; c-Q,R ; d-P,R



$\text{M}^{+2}$  is :-

(1)  $\text{Cu}^{+2}$  (2)  $\text{Ni}^{+2}$  (3)  $\text{Hg}^{+2}$  (4)  $\text{Zn}^{+2}$

30. Which of the following is not a chiral compound :-

- (1)  $[\text{Co}(\text{NH}_3)_3\text{Cl}_3]$
- (2)  $[\text{CoCl}_2(\text{OX})_2]^{3-}$
- (3)  $[\text{Fe}(\text{en})(\text{NH}_3)_2\text{Cl}_2]$
- (4)  $[\text{Cr}(\text{gly})_3]$

31. In which of the following arrangement the order is not according to the property indicated against it -

- (1) Sc < Y < La (Atomic size)
- (2) C < B < N < O (2<sup>nd</sup> Ionisation enthalpy)
- (3) I < Br < F < Cl (Increasing electron gain enthalpy with negative sign)
- (4) B > Al > Ga > In > Tl (Electronegativity)

32. Which of the following would have a permanent dipole moment.

- (1)  $\text{SiF}_4$
- (2)  $\text{SF}_4$
- (3)  $\text{XeF}_4$
- (4)  $\text{BF}_3$

33. Which of the following is paramagnetic with bond order is 0.5.

- (1)  $\text{F}_2$
- (2)  $\text{N}_2$
- (3)  $\text{H}_2$
- (4)  $\text{H}_2^+$

34. **Assertion** : Generally ionic compounds have high boiling point and melting point.

**Reason** : Due to strong electrostatic force of attraction among oppositely charged ions.

- (1) Assertion and Reason both are correct and reason is correct explanation of Assertion.
- (2) Assertion and Reason both are correct but reason is not correct explanation of Assertion.
- (3) Assertion is correct but Reason is incorrect.
- (4) Assertion is incorrect but Reason is correct.

35. Which of the following is not a pair of Lewis base :-

- (1)  $\text{OH}^-$ ,  $\text{H}_2\text{O}$
- (2)  $\text{NH}_3$ ,  $\text{F}^-$
- (3)  $\text{BCl}_3$ ,  $\text{AlCl}_3$
- (4)  $\text{OH}^-$ ,  $\text{F}^-$

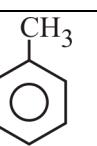
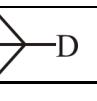
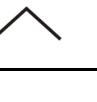
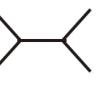
## SECTION-B ( CHEMISTRY )

36. Which of the following reaction is not correctly matched :-

- (1)  $\text{Ph}-\text{COCl} \xrightarrow[\text{Pd-BaSO}_4]{\text{H}_2} \text{Ph}-\text{CHO}$   
Rosenmund's reduction
- (2)  $\text{CH}_3-\text{CN} \xrightarrow[2. \text{H}_3\text{O}^+]{1. \text{SnCl}_2+\text{HCl}} \text{CH}_3-\text{CHO}$   
Stephen's reaction
- (3)  $\text{Ph}-\text{CH}_3 \xrightarrow[2. \text{H}_3\text{O}^+]{1. \text{CrO}_2\text{Cl}_2, \text{CS}_2} \text{Ph}-\text{CHO}$   
Gattermann's-koch reaction
- (4)  $\text{C}_6\text{H}_6 \xrightarrow[\text{Anhy. AlCl}_3]{\text{CH}_3\text{COCl}} \text{C}_6\text{H}_5\text{COCH}_3$   
Friedel-craft acylation

37. Which reaction can't produce haloalkane :-

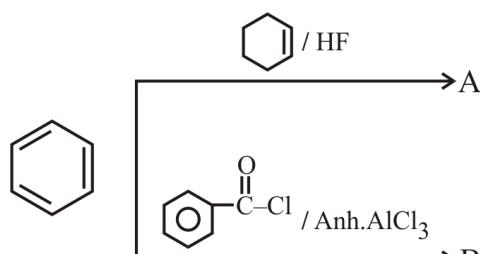
- (1)  $\text{CH}_3\text{CH}_2\text{Br} \xrightarrow[\text{Acetone}]{\text{NaI}}$
- (2)  $\text{CH}_3-\text{CH}_2-\text{CH}_3 \xrightarrow[\Delta, \text{ UV light}]{\text{Br}_2}$
- (3)  $\text{CH}_3-\text{CH}=\text{CH}_2 \xrightarrow{\text{HCl}}$
- (4)  $\text{CH}_4 \xrightarrow{\text{Cl}_2 \text{ in dark}}$

|    |   |    |   |
|----|---|----|---|
| a. | $\text{CH}_3-\text{CH}_2-\text{Cl} \xrightarrow[\text{Ether}]{\text{Na/dry}}$ | P. |  |
| b. | $\text{CH}_3-\text{CH}_2-\text{COONa} \xrightarrow[\Delta]{\text{NaOH.CaO}}$  | Q. |  |
| c. | $\text{CH}_3-\text{CH}_2-\text{MgBr} \xrightarrow{\text{OD}}$                 | R. |  |
| d. | $\text{CH}_3-\text{CH}_2-\text{CCl}_3 \xrightarrow{\text{Zn/HCl}}$            | S. |  |

- (1) a-S, b-R, c-Q, d-P
- (2) a-R, b-S, c-Q, d-P

- (3) a-S, b-R, c-P, d-Q
- (4) a-P, b-Q, c-R, d-S

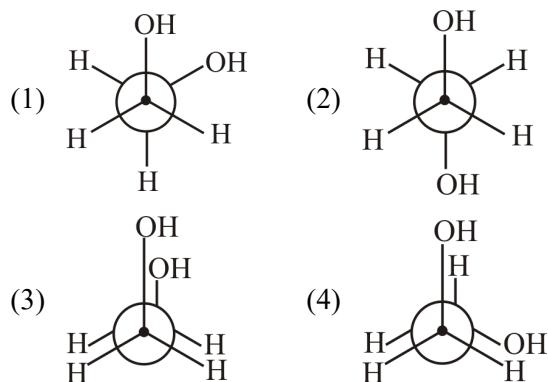
39.



A & B respectively are :-

- (1) ,
- (2) ,
- (3) ,
- (4) ,

40. Most stable conformation of ethylene glycole is :-



41. The strongest reducing agent among the following is -

- (1)  $\text{Li}^+$  (2) Na (3) Fe (4) Cu

42. For the titration between  $\text{KMnO}_4$  and  $\text{H}_2\text{C}_2\text{O}_4$  in acidic medium, the acid used is :-

- (1) dilute  $\text{H}_2\text{SO}_4$  (2) dilute HCl
- (3) concentrate  $\text{HNO}_3$  (4) dilute  $\text{H}_2\text{SO}_3$

43. 28 g of nitrogen gas and 6 g of hydrogen gas are mixed to produce ammonia. Number of moles of ammonia produced in this reaction will be :-

- (1) 1 mol (2) 2 mol
- (3) 3 mol (4) 4 mol

44. For a reaction  $2\text{x}_{(\ell)} + \text{y}_{(\text{g})} \rightarrow 2\text{C}_{(\text{s})} + 2\text{D}_{(\text{g})}$  the value of  $\Delta E$  at  $27^\circ\text{C}$  is  $-28.6 \text{ kcal mol}^{-1}$ , then at the same temperature, value of  $\Delta H$  is \_\_\_\_\_ kcal  $\text{mol}^{-1}$ .

- (1) -28 (2) -28.6
- (3) -29.2 (4) -27.4

45. Which of the following does not exist :-

- (1)  $\text{CuF}_2$  (2)  $\text{CuCl}_2$
- (3)  $\text{CuI}_2$  (4)  $\text{Cu}_2\text{I}_2$

46. Fill in the blank :

$[\text{Fe}(\text{en})_3]^{+3}$  is ..... stable than  $[\text{Fe}(\text{NH}_3)_6]^{+3}$ .

- (1) More (2) Less
- (3) Equal (4) None of these

47. An element (X) which occur in second period has an outer electronic configuration  $\text{ns}^2\text{np}^1$ . What is the formula and nature of its oxide.

- (1)  $\text{XO}_3$ , Basic
- (2)  $\text{X}_2\text{O}_3$ , Acidic
- (3)  $\text{X}_2\text{O}_3$ , Basic
- (4)  $\text{XO}_2$ , Acidic

48. T-shape is exhibited by the molecule :-

- (1)  $\text{ClF}_3$  (2)  $\text{CHCl}_3$
- (3)  $\text{CCl}_4$  (4)  $\text{PCl}_5$

49. Which of the following order of boiling point is correct ?

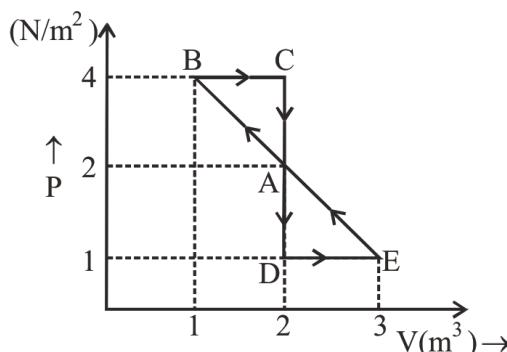
- (1)  $\text{D}_2\text{O} > \text{H}_2\text{O}$
- (2)  $\text{HF} > \text{HCl} > \text{HBr} > \text{HI}$
- (3)  $\text{F}_2 > \text{Cl}_2 > \text{Br}_2 > \text{I}_2$
- (4)  $\text{He} > \text{Ne} > \text{Ar} > \text{Kr} > \text{Xe}$

50. What is the resultant pH of solution formed by mixing of equal volume of two solutions having  $\text{pH} = 3$  and  $\text{pH} = 5$  :-

- (1) 3.5 (2) 4 (3) 3.3 (4) 3.8

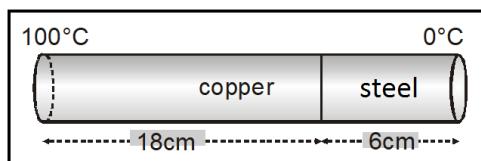
**SECTION-A ( PHYSICS )**

- 51.** One mole of a monoatomic gas is carried along process ABCDEA as shown in the diagram. Find the net work done by gas :-



- (1)  $\frac{3}{2}J$       (2) 1J  
 (3)  $\frac{1}{2}J$       (4) 2J

- 52.** The coefficient of thermal conductivity of copper is nine times that of steel. In the composite cylindrical bar shown in the figure what will be the temperature at the junction of copper and steel ?



- (1) 75°C  
 (2) 67°C  
 (3) 33°C  
 (4) 25°C

- 53.** A 2 gm bullet moving with a velocity of 200 m/s is brought to a sudden stoppage by an obstacle. The total heat produced goes to the bullet. If the specific heat of the bullet is 0.03 cal/gm°C, the rise in its temperature will be :-

- (1) 158.0°C  
 (2) 15.80°C  
 (3) 1.58°C  
 (4) 0.1580°C

- 54.** In closed organ pipe if the frequency of 7<sup>th</sup> overtone is 600 Hz then match the following columns :

|     | <b>Column-I</b>                          | <b>Column-II</b> |
|-----|--|------------------|
| (a) | Frequency of 3 <sup>rd</sup> Overtone is | (p) 200 Hz       |
| (b) | Frequency of 3 <sup>rd</sup> Harmonic    | (q) 280 Hz       |
| (c) | Fundamental frequency                    | (r) 120 Hz       |
| (d) | Frequency of 5 <sup>th</sup> Harmonic    | (s) 40 Hz        |

Select the correct option

- (1) (a)→p (b)→q (c)→r (d)→s  
 (2) (a)→r (b)→q (c)→s (d)→p  
 (3) (a)→q (b)→r (c)→s (d)→p  
 (4) (a)→q (b)→r (c)→p (d)→s

- 55.** Stationary waves are produced in 10m long stretched string. If the string vibrates in 2 segments and wave velocity is 20 m/sec, then the frequency is :-

- (1) 10 Hz      (2) 5Hz  
 (3) 2Hz      (4) 4Hz

- 56.** The displacement from mean position of a particle in SHM at 3 seconds is  $\sqrt{3}/2$  of the amplitude. Its time period will be :-

(let particle starts from mean position)

- (1) 18 sec.  
 (2)  $6\sqrt{3}$  sec.  
 (3) 9 sec.  
 (4)  $3\sqrt{3}$  sec.

57. Magnifying power of an astronomical telescope is 5. The separation between objective and eye-piece is 36 cm and the final image is formed at infinity. Calculate focal length of objective lens :-

- (1) 30 cm
- (2) 25 cm
- (3) 6 cm
- (4) 12 cm

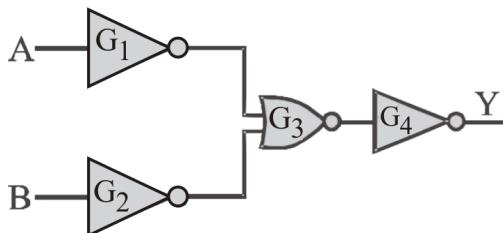
58. A glass slab of thickness 3 cm is placed on ink mark on a piece of paper. For a person looking at the mark at a distance 5.0 cm above it, the distance of mark will appear to be 4.0 cm then refractive index of the slab will be:

- (1)  $\frac{4}{3}$
- (2)  $\frac{3}{2}$
- (3)  $\frac{3}{5}$
- (4)  $\frac{5}{3}$

59. A ray of light strikes a glass plate at an angle of  $60^\circ$ . If the reflected and refracted rays are perpendicular to each other, the index of refraction of glass is :-

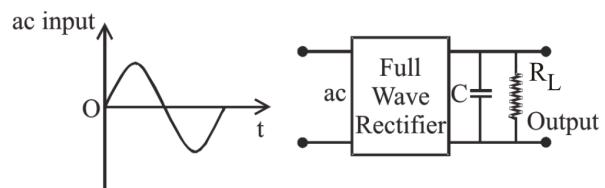
- (1)  $\sqrt{3}$
- (2) 3/2
- (3)  $\sqrt{3}/2$
- (4) 1/2

60. The combination of gates shown below produces:-

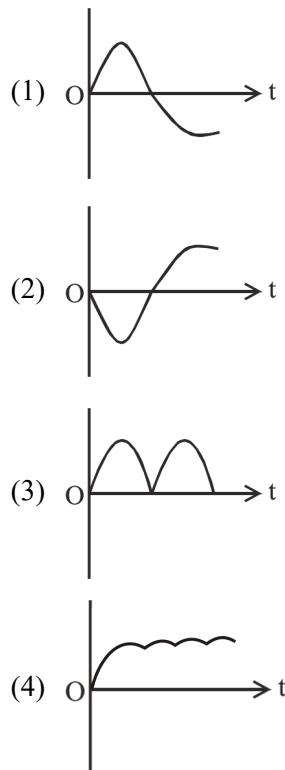


- (1) AND gate
- (2) XOR gate
- (3) NOR gate
- (4) NAND gate

61. A full-wave rectifier circuit with an ac input is shown



The output voltage across  $R_L$  is represented as :-



62. An electron makes a transition from an excited state to the ground state of a hydrogen-like atom/ion :-

- (1) Its kinetic energy increases but potential energy and total energy decrease
- (2) Kinetic energy, potential energy and total energy decrease
- (3) Kinetic energy decreases, potential energy increases but total energy remain same
- (4) Kinetic energy and total energy decreases but potential energy increases

63. The kinetic energy of an electron gets tripled, then the de-Broglie wavelength associated with it becomes how many times :-

- (1)  $\frac{1}{3}$
- (2)  $\sqrt{3}$
- (3)  $\frac{1}{\sqrt{3}}$
- (4) 3

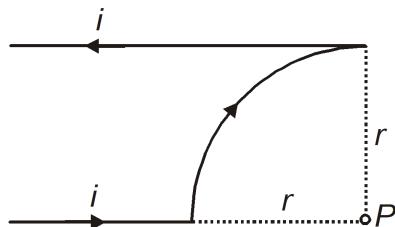
64. This question contains Statement-1 and Statement-2. From the four choices given after the statements, choose the one that best describes the two statements.

**Statement-1 :** Energy is released when heavy nuclei undergo fission or light nuclei undergo fusion.

**Statement-2 :** For heavy nuclei, binding energy per nucleon increases with increasing Z while for light nuclei it decreases with increasing Z.

- (1) Statement-1 is false, Statement-2 is true.
- (2) Statement-1 is true, Statement-2 is true; Statement-2 is a correct explanation for Statement-1.
- (3) Statement-1 is true, Statement-2 is true; Statement-2 is not a correct explanation for Statement-1.
- (4) Statement-1 is true, Statement-2 is false.

65. A current carrying conductor is placed as shown in figure. The magnitude of magnetic field at point P will be :

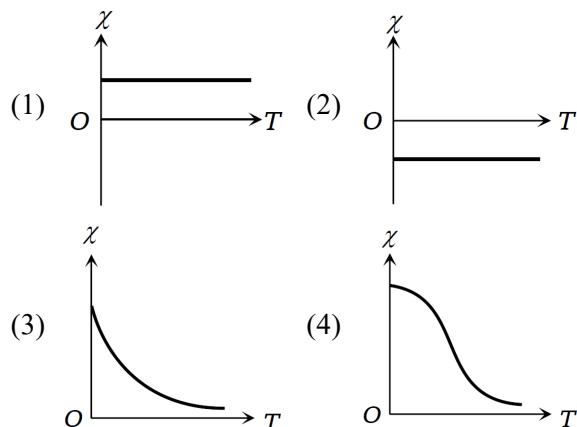


- (1)  $\frac{\mu_0}{4\pi} \frac{2i}{r} \left( \frac{\pi}{2} + 1 \right)$
- (2)  $\frac{\mu_0}{4\pi} \frac{2i}{r} \left( \frac{\pi}{2} - 1 \right)$
- (3)  $\frac{\mu_0}{4\pi} \frac{i}{r} \left( \frac{\pi}{2} + 1 \right)$
- (4)  $\frac{\mu_0}{4\pi} \frac{i}{r} \left( \frac{\pi}{2} - 1 \right)$

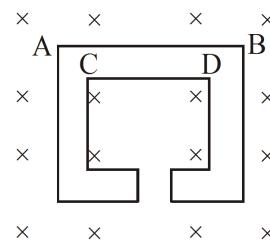
66. A charge q moves in a region where electric field and magnetic field both exist, then force on it :-

- (1)  $q(\vec{v} \times \vec{B})$
- (2)  $q\vec{E} + q(\vec{v} \times \vec{B})$
- (3)  $q\vec{E} + q(\vec{B} \times \vec{v})$
- (4)  $q\vec{B} + q(\vec{E} \times \vec{v})$

67. The variation of magnetic susceptibility ( $\chi$ ) with temperature (T) for a diamagnetic substance is best represented by

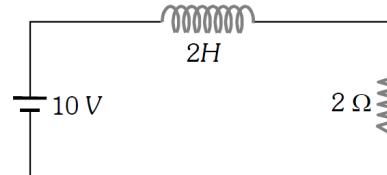


68. A wire is bent to form the double loop shown in the figure. There is a uniform magnetic field directed into the plane of the loop. If the magnitude of this field is decreasing, current will flow from



- (1) A to B and C to D
- (2) B to A and D to C
- (3) A to B and D to C
- (4) B to A and C to D

69. In the figure, final magnetic energy stored in the coil is :-

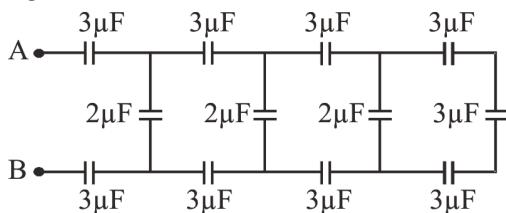


- (1) Zero
- (2) Infinite
- (3) 25 joules
- (4) None of the above

70. A charge  $q$  is located at the centre of a cube. The electric flux through any face is (where  $k = \frac{1}{4\pi\epsilon_0}$ )

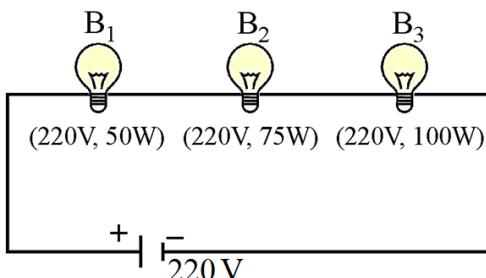
(1)  $\frac{4\pi kq}{24}$       (2)  $\frac{4\pi kq}{6}$   
 (3)  $\frac{\pi q}{6}$       (4)  $\frac{kq}{6}$

71. The resultant capacitance between A and B in the figure :



(1)  $1\mu\text{F}$       (2)  $10\mu\text{F}$   
 (3)  $50\mu\text{F}$       (4)  $1.5\mu\text{F}$

72. Find the order of brightness of given bulbs :



(1)  $B_1 > B_2 > B_3$       (2)  $B_2 > B_1 > B_3$   
 (3)  $B_3 > B_2 > B_1$       (4) None

73.  $V = 2\sqrt{2} + 16 \sin \omega t$  Find RMS value of voltage :-

(1) 11.66      (2) 4  
 (3) 0      (4) 18

74. If  $K = \frac{d^4x}{dt^4}$  find dimensional formula of K :-  
 (X : Position, t : time)

(1)  $[LT^{-3}]$       (2)  $[L^4T^{-4}]$   
 (3)  $[LT^{-4}]$       (4)  $[LT^4]$

75. A ball having initial velocity as  $\vec{v} = 20\hat{i} + 40\hat{j}$  calculate time of flight?

(1) 4 sec      (2) 8 sec  
 (3) 16 sec      (4) 5 sec

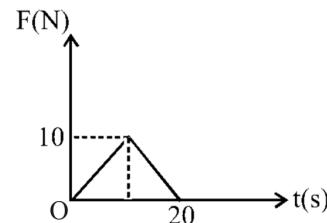
76. A man is walking on a road with a velocity of 3 km/h when suddenly, it starts raining, velocity of rain is 10 km/h in vertically downward direction, relative velocity of the rain with respect to man is :

(1)  $\sqrt{13}$  km/hr      (2)  $\sqrt{7}$  km/hr  
 (3)  $\sqrt{109}$  km/hr      (4) 13 km/h

77. A body is sliding on ice with velocity 10 m/sec comes to rest after travelling 50 m. The coefficient of friction between body and ice ( $g = 10 \text{ m/s}^2$ ) is :-

(1) 0.1      (2) 0.3      (3) 0.4      (4) 0.6

78. Force acting on a particle of mass 2kg is as shown in figure. If initial velocity of a particle is 5 m/s, then find final momentum.



(1) 100 N. sec      (2) 110 N. sec  
 (3) 105 N. sec      (4) 120 N. sec

79. The maximum velocity with which a car driver can traverse a flat curve of radius 150 m and coefficient of friction 0.6 to avoid skidding is :-

(1) 60 m/s      (2) 30 m/s  
 (3) 15 m/s      (4) 25 m/s

80. Consider the following statements :-

(a) COM of a uniform semicircular disc of radius R is at  $2R/\pi$  from the centre.  
 (b) COM of a uniform semicircular ring of radius R is at  $4R/3\pi$  from the centre.  
 (c) COM of a solid hemisphere of radius R is at  $4R/3\pi$  from the centre.  
 (d) COM of a hemispherical shell of radius R is at  $R/2$  from the centre

Which statement is correct ?

(1) a, b, d      (2) a, c, d  
 (3) only d      (4) only a and b

81. The moment of inertia of a disc of radius 0.3m about its geometric axis is  $2\text{Kg m}^2$ . If a string is tied to its circumference and a force of 15 Newton is applied, the value of angular acceleration with respect to this axis will be :-

- (1)  $2.5 \text{ rad/s}^2$       (2)  $4.5 \text{ rad/s}^2$   
 (3)  $2.25 \text{ rad/s}^2$       (4)  $5 \text{ rad/s}^2$

82. A satellite of earth of mass 'm' is taken from orbital radius  $2R$  to  $3R$ , then work done is :-  
 (Mass of earth M)

- (1)  $\frac{GMm}{6R}$       (2)  $\frac{GMm}{12R}$   
 (3)  $\frac{GMm}{24R}$       (4)  $\frac{GMm}{3R}$

83. For increasing the length by 0.5 mm of a metal wire of length 2 m and area of cross-section  $2 \text{ mm}^2$ , the force required is  $1.2 \times 10^2 \text{ N}$ . Young's modulus of the metal is :-

- (1)  $2.4 \times 10^{12} \text{ N/m}^2$       (2)  $1.2 \times 10^{12} \text{ N/m}^2$   
 (3)  $1.2 \times 10^{11} \text{ N/m}^2$       (4)  $2.4 \times 10^{11} \text{ N/m}^2$

84. Water rises in a capillary tube when its one end is dipped vertically in it, is 3 cm. If the surface tension of water is  $75 \times 10^{-3} \text{ N/m}$ , then the diameter of capillary will be :-

- (1) 0.1 mm      (2) 0.5 mm  
 (3) 1.0 mm      (4) 2.0 mm

85. In a series LCR circuit  $R = 4\Omega$ ,  $X_L = 5\Omega$  and  $X_C = 8 \Omega$ , the current :-

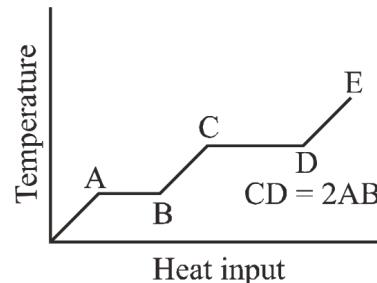
- (1) Leads the voltage by  $\tan^{-1}(3/4)$   
 (2) Leads the voltage by  $\tan^{-1}(5/8)$   
 (3) Lags the voltage by  $\tan^{-1}(3/4)$   
 (4) Lags the voltage by  $\tan^{-1}(5/8)$

## SECTION-B ( PHYSICS )

86. The pressure of air in the bulb of constant volume air thermometer is 75 cm and 100 cm of Hg column at  $0^\circ\text{C}$  and  $100^\circ\text{C}$  respectively. It records 80 cm of Hg pressure at room temperature then room temperature is :-

- (1)  $15^\circ\text{C}$       (2)  $20^\circ\text{C}$       (3)  $25^\circ\text{C}$       (4)  $40^\circ\text{C}$

87. A solid material is supplied with heat at constant rate and the temperature of the material changes as shown below. From the graph, the *false* conclusion drawn is :-

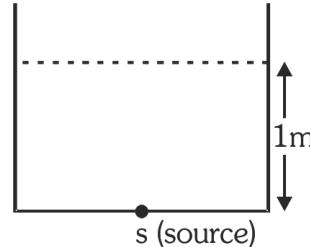


- (1) AB and CD of the graph represent phase changes  
 (2) AB represent the change of state from solid to liquid  
 (3) latent heat of fusion is twice the latent heat of vaporization  
 (4) latent heat of vaporization is twice the latent heat of fusion

88. One mole of an ideal gas at temperature  $T_1$  expands according to the law  $\frac{P}{V^2} = a$  (constant). The work done by the gas till temperature of gas becomes  $T_2$  is:-

- (1)  $\frac{1}{2}R(T_2 - T_1)$       (2)  $\frac{1}{3}R(T_2 - T_1)$   
 (3)  $\frac{1}{4}R(T_2 - T_1)$       (4)  $\frac{1}{5}R(T_2 - T_1)$

89.



A container is filled with water ( $\mu = \frac{4}{3}$ ) upto height 1m. Find out diameter of disc at top of water surface from which light is coming out.

- (1)  $\frac{1}{\sqrt{7}}\text{m}$       (2)  $\frac{2}{\sqrt{7}}\text{m}$   
 (3)  $\frac{6}{\sqrt{7}}\text{m}$       (4)  $\frac{3}{\sqrt{7}}\text{m}$

- 90.** Two coherent sources of intensity ratio 1 : 4 produce interference pattern, the fringe visibility will be:
- 1
  - 0.8
  - 0.4
  - 0.6
- 91.** Maximum velocity of the photoelectrons emitted by a metal surface is  $1.2 \times 10^6 \text{ ms}^{-1}$ . Assuming the specific charge of the electron to be  $1.8 \times 10^{11} \text{ C kg}^{-1}$ , the value of stopping potential (in volt) will be :-
- 2
  - 3
  - 4
  - 6
- 92.** In the experiment of photoelectric effect saturation current ( $i_s$ ) is 5mA and stopping potential ( $V_s$ ) is 10V. If intensity (number of photons per unit time) and frequency of light both are doubled then :
- $i_s = 5\text{mA}$  and  $V_s = 10\text{V}$
  - $i_s = 10\text{mA}$  and  $V_s = 20\text{V}$
  - $i_s = 5\text{mA}$  and  $V_s > 20\text{V}$
  - $i_s = 10\text{mA}$  and  $V_s > 20\text{V}$
- 93.** Oscillating magnetic field in a plane EMW is given by  $B_y = 8 \times 10^{-6} \sin(5000 \pi x - 3 \times 10^{11} \pi t)\text{T}$ . Expression for oscillating electric field will be
- $\vec{E} = 240 \sin(5000 \pi x - 3 \times 10^{11} \pi t) \hat{k}$
  - $\vec{E} = 480 \sin(5000 \pi x - 3 \times 10^{11} \pi t) \hat{k}$
  - $\vec{E} = +2400 \sin(5000 \pi x - 3 \times 10^{11} \pi t) \hat{k}$
  - $\vec{E} = -480 \sin(5000 \pi x - 3 \times 10^{11} \pi t) \hat{k}$
- 94.** Two point charges repel each other with a force of 100 N. One of the charges is increased by 10% and the other is reduced by 10%. The new force of repulsion at the same distance would be :-
- 100 N
  - 121 N
  - 99 N
  - none of these
- 95.** You are given an arrangement of three point charges  $q$ ,  $2q$  and  $xq$  separated by equal finite distances so that electric potential energy of the system is zero. Then the value of  $x$  is.
- $-\frac{2}{3}$
  - $-\frac{1}{3}$
  - $\frac{2}{3}$
  - $\frac{3}{2}$

- 96.** Reading of ammeter  $A_1$ ,  $A_2$  and  $A_3$  will be respectively :-
- 
- (1) 1A, 0A, 1A      (2) 2A, 1A, 1A  
 (3) 1A, 0.5A, 0.5A      (4) None of these
- 97.** Particle of mass '1 kg' is moving on the 'x-axis' such that force on a particle varies with position as shown in graph. Select the position of stable equilibrium for the particle :
- 
- (1) A      (2) B      (3) C      (4) D
- 98.** A body of mass 2 kg moving with a velocity of 3 m/sec collides head on with a body of mass 1 kg moving in opposite direction with a velocity of 4 m/sec. After collision, two bodies stick together and move with a common velocity which in m/sec is equal to
- 1/4
  - 1/3
  - 2/3
  - 3/4
- 99.** A disc of mass 2 kg and radius 0.2 m is rotating with angular velocity 30 rad/sec. If a mass of 0.25 kg is put on periphery of disc then angular velocity of disc is :-
- 24 rad/sec
  - 36 rad/sec
  - 15 rad/sec
  - 26 rad/sec
- 100.** An earth satellite is revolving around earth in an orbit whose radius is one-fourth of the radius of orbit of a communication satellite (time period 24 hrs). Time period of revolution is :
- 3 hr
  - 6 hr
  - 4 days
  - 72 days

## **Topic : FULL SYLLABUS**

## **SECTION-A ( BOTANY )**



106. Read the following statement carefully :

  - (a) The main plant body of the bryophyte is A.
  - (b) In brown algae the vegetative cells have a cellulosic cell wall usually covered on the outside by a gelatinous coating of B.
  - (c) The pteridophytes are classified into C classes.
  - (d) In the angiosperms the pollen grains and ovules are developed in specialized structures called D.

Identify A, B, C and D respectively :

|     | <b>A</b> | <b>B</b>  | <b>C</b> | <b>D</b> |
|-----|----------|-----------|----------|----------|
| (1) | Haploid  | Algin     | Three    | Flower   |
| (2) | Diploid  | Carrageen | Three    | Cone     |
| (3) | Haploid  | Algin     | Four     | Flower   |
| (4) | Diploid  | Carrageen | Four     | Cone     |

- 107.** Which of the following is correctly matched ?

  - (1) Alternate phyllotaxy - Mustard
  - (2) Opposite phyllotaxy - Sunflower
  - (3) Whorled phyllotaxy - Guava
  - (4) Reticulate Venation - Monocot plants

**108.** "Ten stamens, diadelphous condition, dithecos anther" above characters are found in :-

  - (1) Arhar
  - (2) Brinjal
  - (3) Onion
  - (4) Mustard

**109.** In sunflower placentation is :-

  - (1) Marginal
  - (2) Axile
  - (3) Basal
  - (4) Parietal

- 110.** Match the column-I with column-II and select the correct option :-

|    | Column-I                       |       | Column-II    |
|----|--------------------------------|-------|--------------|
| a. | Starch sheath                  | (i)   | Monocot stem |
| b. | Sclerenchymatous hypodermis    | (ii)  | Dicot leaf   |
| c. | Polyarch xylem bundles         | (iii) | Dicot stem   |
| d. | Palisade and spongy parenchyma | (iv)  | Monocot root |

- (1) a-(iii), b-(i), c-(ii), d-(iv)
- (2) a-(iii), b-(iv), c-(i), d-(ii)
- (3) a-(iii), b-(i), c-(iv), d-(ii)
- (4) a-(ii), b-(iii), c-(iv), d-(i)

- 111.** Select the correct option for monocot stems ?

- (1) Parenchymatous Hypodermis
- (2) Xylem is exarch
- (3) Well developed pith
- (4) Scattered vascular bundles

- 112.** The layer of cells between endodermis and vascular bundle is called.

- (1) Epidermis
- (2) Cortex
- (3) Pericycle
- (4) Pith

- 113.** What is the final electron acceptor in the Z-scheme of photosynthesis?

- (1) NADPH
- (2) Water
- (3) ATP
- (4)  $\text{NADP}^+$

- 114.** How many ATP and  $\text{NADPH}_2$  are required in the regeneration step of Calvin cycle during the fixation of one molecule of  $\text{CO}_2$  ?

- (1) 6 ATP and 6  $\text{NADPH}_2$
- (2) 12 ATP and 12  $\text{NADPH}_2$
- (3) 1 ATP and 0  $\text{NADPH}_2$
- (4) 6 ATP and 0  $\text{NADPH}_2$

- 115.** Match **List-I** with **List-II** :

|    | List-I                    |     | List-II                             |
|----|---------------------------|-----|-------------------------------------|
| A. | Tricarboxylic acid cycle  | I   | In the inner mitochondrial membrane |
| B. | EMP pathway               | II  | Substrate is pyruvic acid           |
| C. | Electron transport system | III | Formation of $\text{FADH}_2$        |
| D. | Oxidative decarboxylation | IV  | End Product is pyruvic acid         |

Choose the correct answer from the options given below :-

- (1) A-III, B-IV, C-II, D-I
- (2) A-IV, B-II, C-I, D-III
- (3) A-II, B-III, C-I, D-IV
- (4) A-III, B-IV, C-I, D-II

- 116.** In which of the following processes substrate level phosphorylation occurs ?

- (1) 3-phosphoglycerate  $\rightarrow$  2-phosphoglycerate
- (2) 2-phosphoglycerate  $\rightarrow$  2-Phosphoenolpyruvate
- (3) 1,3 bisphosphoglycerate  $\rightarrow$  3-phosphoglycerate
- (4) Fructose-6-phosphate  $\rightarrow$  Fructose 1,6-bisphosphate

- 117.** Which of the following is an example of plasticity ?

- (1) Heterophylly in cotton, coriander and larkspur
- (2) Heterophylly in buttercup
- (3) Bolting in beat and cabbage
- (4) Both (1) and (2)

118. Which one of the PGRs would be used for following physiological effects ?
- Induce parthenocarpy in tomatoes.
  - Hastens fruit ripening in tomatoes and apples.
  - Synchronising fruit set in pineapple.
  - Elongate and improvement in shape of apple.
  - Promote nutrient mobilization.
- A–Auxins, B–Ethephon, C–Ethylene, D–GA, E–Cytokinin
  - A–Ethylene, B–GA, C–Auxin, D–Ethephon, E–Cytokinin
  - A–Auxin, B–Ethephon, C–Cytokinin, D–Ethylene, E–GA
  - A–Cytokinin, B–Auxin, C–GA, D–Ethephon, E–Ethylene
119. In some angiosperms, pollen grain at 3 celled stage contain,
- 3 male gametes
  - 1 vegetative cell & 2 generative cell
  - 1 vegetative cell & 2 male gametes
  - two vegetative cell & 1 male gamete
120. Which of the following event is not included under post fertilization event ?
- Development of embryo
  - Development of endosperm
  - Transformation of ovary into fruit
  - Formation of embryo sac
121. **Assertion:** One of the problems of hybrids is that hybrids seeds have to be produced every year.  
**Reason:** Seeds collected from hybrids are sown, genes in progeny plants will segregate and do not maintain hybrid characters.
- A is false but R is true.
  - A is true but R is false.
  - Both A and R are true and R is not correct explanation of A.
  - Both A and R are true and R is correct explanation of A.

122. Select the incorrect option ?
- Morgan worked with the tiny fruit flies.
  - Life cycle of *Drosophila* is about three weeks
  - Morgan coined term linkage
  - Very tightly linked genes show less recombination
123. What is the Ratio of progeny, when a red colored heterozygote is crossed with a white colored plant in which red coloured is dominant at white color.
- 3:1
  - 1:1
  - 1:2:1
  - 9:3:3:1
124. **Statement-I :** Today genetic maps are extensively used as starting point in the sequencing of whole genomes.  
**Statement-II :** Female heterogamety is present in grasshopper.
- Both Statement-I and Statement-II are correct.
  - Both Statement-I and Statement-II are incorrect.
  - Statement-I is correct and Statement-II is incorrect.
  - Statement-I is incorrect and Statement-II is correct.
125. Select the 'incorrect' statement :
- In eukaryotes at least three RNA polymerases in nucleus.
  - The RNA polymerase I transcribes precursor of mRNA.
  - tRNA has an anticodon loop has bases complementary to the codon.
  - For initiation a specific tRNA that is refined to as initiation tRNA

131. Match the **column-I** and **column-II** and choose the correct option :-

|       | <b>Column-I</b>                         |     | <b>Column-II</b>                                       |
|-------|---|-----|--|
| (i)   | Average price tag of ecosystem services | (a) | 50% of total estimated cost of ecosystem services      |
| (ii)  | Global gross national product (GNP)     | (b) | US \$ 33 trillion                                      |
| (iii) | Soil formation                          | (c) | 10% each of total estimated cost of ecosystem services |
| (iv)  | Recreation and nutrient cycling         | (d) | US \$ 18 trillion                                      |

(1) (i)-(b), (ii)-(d), (iii)-(c), (iv)-(a)  
(2) (i)-(c), (ii)-(d), (iii)-(a), (iv)-(b)  
(3) (i)-(d), (ii)-(b), (iii)-(a), (iv)-(c)  
(4) (i)-(b), (ii)-(d), (iii)-(a), (iv)-(c)

132. Amazon rain forests are been cut down for cultivating :

(1) Sunflower                          (2) Maize  
(3) Soya-beans                        (4) Mustard

133. The interaction between clown fish and sea anemone is an example of :-

(1) mutualism  
(2) commensalism  
(3) proto-cooperation  
(4) competition

134. In a growing population of a country :

(1) Pre-reproductive individuals are more than the reproductive individuals  
(2) Reproductive individuals are less than the post reproductive individuals  
(3) Reproductive and pre-reproductive individuals are equal in number  
(4) Pre-reproductive individuals are less than the reproductive individuals

135. Potent force in organic evolution is :-

- (1) Predation
- (2) Interspecific competition
- (3) Exploitation
- (4) Parasitism

## SECTION-B ( BOTANY )

136. Select the incorrect match pair from the following :-

|   | <b>Column-I<br/>(common names)</b> | <b>Column-II<br/>(scientific names)</b> |
|---|------------------------------------|---|
| 1 | Mango                              | <i>Mangifera indica</i>                 |
| 2 | Lion                               | <i>Panthera tigris</i>                  |
| 3 | Brinjal                            | <i>Solanum melongena</i>                |
| 4 | Potato                             | <i>Solanum tuberosum</i>                |

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

**Assertion (A)** : All gymnosperms are heterosporous.

**Reason (R)** : The leaves in gymnosperms are well-adapted to withstand extremes of temperature, humidity and wind. In the light of above statements, choose the correct answer from the options given below :

- (1) Both (A) and (R) are true but (R) is not the correct explanation of (A).
- (2) (A) is true but (R) is false.
- (3) (A) is false but (R) is true.
- (4) Both (A) and (R) are true and (R) is the correct explanation of (A).

138. Given below are two statements :

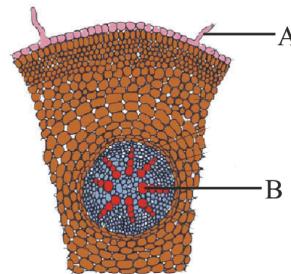
**Statement-I** : Thimble like structure root cap protects the tender apex of the root.

**Statement-II** : Leaves are often modified to perform functions other than photosynthesis.

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

- (1) Both Statement-I and Statement-II are incorrect.
- (2) Statement-I is correct and Statement-II are incorrect.
- (3) Statement-I is incorrect and Statement-II are correct.
- (4) Both Statement-I and Statement-II are correct.

139. Identify the given diagram and correct labelling :-



- (1) Dicot root  $\Rightarrow$  A-Root hair; B-Protoxylem
- (2) Monocot Root  $\Rightarrow$  A-Root hair, B-Metaxylem
- (3) Dicot Root  $\Rightarrow$  A-Root hair, B-Metaxylem
- (4) Monocot Root  $\Rightarrow$  A-Root hair, B- Phloem

140. Read the following statements carefully :-

- (A) Light saturation occurs at 10% of the full sunlight.
- (B) Carbon dioxide is the major limiting factor for photosynthesis.
- (C) The C<sub>4</sub> plants respond to higher temperature and show higher rate of photosynthesis.
- (D) Water stress causes the stomata to close hence reducing the CO<sub>2</sub> availability.
- (E) Increase in incident light beyond a point causes the breakdown of chlorophyll and a decrease in photosynthesis.

How many statements are correct ?

- (1) Two (2) Three (3) Four (4) Five

**141.** All of the enzymes of the TCA cycle are located in the mitochondrial matrix, except :

- (1) Citrate synthetase
- (2)  $\alpha$ -ketoglutarate dehydrogenase
- (3) Succinate dehydrogenase
- (4) Fumerase

**142.** Increased vacuolation, cell enlargement and new cell wall deposition are the characteristics of the cells in which of the following phase :-

- (1) Meristematic phase of growth
- (2) Maturation phase of growth
- (3) Elongation phase of growth
- (4) Senescent phase of growth

**143. Assertion :** Isomerases catalysing inter-conversion of optical geometric or positional isomers.

**Reason :** Almost all enzymes are proteins.

- (1) Both Assertion & Reason are True & the Reason is a correct explanation of the Assertion.
- (2) Both Assertion & Reason are True but Reason is not a correct explanation of the Assertion.
- (3) Assertion is True but the Reason is False.
- (4) Both Assertion & Reason are False.

**144.** Occurrence of more than one embryo in a seed is referred to as :-

- (1) False polyembryony
- (2) Polyembryony
- (3) Parthenocarpy
- (4) Apospory

**145.** Sickle cell anaemia is an example of A. In sickle cell anaemia glutamate is replaced by B.

- (1) A-Polygenic inheritance, B-Valine
- (2) A-Pleotropism, B-Valine
- (3) A-Polygenic inheritance, B-Proline
- (4) A-Pleotropism, B-Proline

**146.** Match the column-I with column-II:

|    | Column-I  |      | Column-II |
|----|---|------|-----------|
| A. | Provide the template during translation                     | i.   | Capping   |
| B. | Unusual nucleotide is added to the 5' end hnRNA             | ii.  | splicing  |
| C. | Adenylate residues are added at 3'-end                      | iii. | m-RNA     |
| D. | Introns are removed and exons are joined in a defined order | iv.  | r-RNA     |
| E. | Play structural and catalytic role during translation       | v.   | tailing   |

|     | A   | B   | C   | D  | E   |
|-----|-----|-----|-----|----|-----|
| (1) | i   | ii  | iii | iv | v   |
| (2) | v   | iv  | ii  | i  | iii |
| (3) | iii | i   | v   | ii | iv  |
| (4) | ii  | iii | iv  | v  | i   |

**147.** Microbes associated with plant which absorbs phosphorus from soil and passes it to the plant is -

- (1) *Glomus*
- (2) *Azospirillum*
- (3) *Anabaena*
- (4) *Nostoc*

**148.** A of an ecosystem is the rate of production of organic matter during photosynthesis. Identify A -

- (1) NPP
- (2) GPP
- (3) R
- (4) Secondary productivity

**149.** Indigenous catfish are in danger because of the introduction of :

- (1) Nile perch
- (2) Cichlid fish
- (3) *Clarias gariepinus*
- (4) All of the above

**150.** Populations evolve to maximise their reproductive fitness, also called :-

- (1) Mendelian fitness
- (2) Darwinian fitness
- (3) Lamarckian fitness
- (4) Chapmannian fitness

**Topic : FULL SYLLABUS**
**SECTION-A ( ZOOLOGY )**

**151.** Skeleton, respiratory and circulatory system are absent in –

- (1) Mollusca                          (2) Hemichordata
- (3) Echinodermata                    (4) Platyhelminthes

**152.** "Muscular foot" as locomotory organ found in :-

- (1) Earthworm                        (2) Hirudinaria
- (3) Pila                                (4) Nereis

**153.** First successful terrestrial vertebrates is :-

- (1) Amphibia                         (2) Aves
- (3) Reptilia                         (4) Mammals

**154.** Read the following statement :

- (A) 8 external rows of ciliary comb plates found in the ctenophora.
  - (B) In Ascaris muscular pharynx present.
  - (C) Echinoderms are freshwater organisms.
  - (D) Chitinous exoskeleton is property of arthropods.
- Choose the correct ones :

- (1) A, B, C                         (2) A, B, C, D
- (3) A, B, D                         (4) B, C, D

**155.** Match the columns and find out the correct option :

|     |                    |       |                                    |
|-----|--------------------|-------|------------------------------------|
| (A) | Parapodia          | (I)   | Balancing organs                   |
| (B) | Statocysts         | (II)  | Respiratory and excretory function |
| (C) | Feather like gills | (III) | Help in swimming                   |
| (D) | Radula             | (IV)  | File-like rasping organ            |

- (1) A-II, B-I, C-III, D-IV
- (2) A-I, B-III, C-II, D-IV
- (3) A-III, B-I, C-II, D-IV
- (4) A-III, B-I, C-IV, D-II

**156.** Which epithelium found in ducts of salivary glands ?

- (1) Compound epithelium
- (2) Columnar epithelium
- (3) Glandular columnar epithelium
- (4) Cuboidal epithelium

**157.** Cytoplasmic communication between two adjacent cells provided by :-

- (1) Tight junction                    (2) Adhering junction
- (3) Interdigititation                (4) Gap junction

**158.** Metamorphosis in cockroach is :-

- (1) Ametabolous                    (2) Paurometabolous
- (3) Holometabolous                (4) Hemimetabolous

**159.** Read the statement(s) carefully and fill the blanks with correct option -

In frogs, forebrain includes olfactory lobes,  
 \_\_\_\_\_ A \_\_\_\_\_ cerebral hemispheres and diencephalon.  
 Hind brain consist of \_\_\_\_\_ B \_\_\_\_\_.

- (1) A-paired,  
 B-cerebellum and medulla oblongata
- (2) A-paired,  
 B-cerebellum, pons and medulla oblongata
- (3) A-unpaired,  
 B-cerebellum, pons and medulla oblongata
- (4) A-unpaired,  
 B-pons and medulla oblongata.

**160.** Read the following statements carefully and choose correct option.

- (1) All vertebrate possess a muscular heart
- (2) In fishes heart having 3 chambers
- (3) All reptiles have 4 chambered heart
- (4) All amphibian are marine animals

**161.** Which of the following is incorrect statement ?

- (1) Fibrinogen, globulins and albumins are the major proteins of plasma.
- (2) Basophils are involved in inflammatory reactions.
- (3) Platelets are cell fragments produced from leucocytes.
- (4) Blood is a special connective tissue.

**162.** The movement of air in and out of the lungs is carried out by creating a pressure gradient between the .....(i)..... and the .....(ii).....

Fill the blanks (i) & (ii) correctly.

- (1) (i)-lungs, (ii)-atmosphere
- (2) (i)-lungs, (ii)-blood
- (3) (i)-Alveoli, (ii)-Blood vessels
- (4) (ii) Trachea, (i) - lungs

**163.** Columns of Bertini in the kidneys of mammals are formed as extensions of –

- (1) Cortex in medulla
- (2) Cortex in pelvis
- (3) Medulla in pelvis
- (4) Pelvis in ureter

**164.** Match the following

|     |                    |     |                 |
|-----|--------------------|-----|-----------------|
| (1) | Protonephridia     | (a) | Annelids        |
| (2) | Nephridia          | (b) | Platyhelminthes |
| (3) | Malpighian tubules | (c) | Vertebrates     |
| (4) | Kidney             | (d) | Insects         |

- (1) 1 = d, 2 = b, 3 = c, 4 = a
- (2) 1 = d, 2 = b, 3 = a, 4 = c
- (3) 1 = a, 2 = b, 3 = c, 4 = d
- (4) 1 = b, 2 = a, 3 = d, 4 = c

**165.** Which cell organelles is absent in neuronal cells ?

- (1) Mitochondria
- (2) Centriole
- (3) Nucleus
- (4) Golgi body

**166.** Name the cell which are present in inter tubular spaces produces group of hormone called androgens :-

- (1) Leydig cell
- (2) Interstitial cell
- (3) Sertoli cells
- (4) Both (1) and (2)

**167.** Which hormone helps in reabsorption of  $\text{Na}^+$  and secretion of  $\text{K}^+$  from renal tubule ?

- (1) PTH
- (2) ANF
- (3) Aldosterone
- (4) Thyrocalcitonin

**168.** Match the column - I with column - II and select the correct option.

| Column - I |                    | Column - II |                     |
|------------|--------------------|-------------|---------------------|
| A.         | Somatostatin       | I.          | Pancreas            |
| B.         | Acromegaly         | II.         | Posterior pituitary |
| C.         | Diabetes insipidus | III.        | Hypothalamus        |
| D.         | Diabetes mellitus  | IV.         | Anterior pituitary  |

- (1) A – III, B – II, C – IV, D – I
- (2) A – II, B – IV, C – I, D – III
- (3) A – I, B – IV, C – II, D – III
- (4) A – III, B – IV, C – II, D – I

169. Structure which is not a part of pelvic girdle :-

- (1) Acetabulum
- (2) Glenoid cavity
- (3) Ischium
- (4) Pubis

170. The cross arm of myosin head has two different sites for binding. These sites help it to bind with-

- (1) ATP and ADP
- (2) ATP and Actin
- (3) ATP and meromyosin
- (4) Actin and tropomyosin

171. During which stage of life the oogenesis process is initiated ?

- (1) Adult stage
- (2) Puberty stage
- (3) Embryonic development stage
- (4) Birth

172. GEAC stand for -

- (1) Genome Engineering Action Committee
- (2) Genetic Engineering Approval Committee
- (3) Genetic and Environmental Approval committee
- (4) Genome and Environmental Approval committee

173. **Assertion** : Placenta also act as an endocrine gland.  
**Reason** : It secretes many hormones essential for pregnancy.

- (1) Both Assertion & Reason are True & the Reason is a correct explanation of the Assertion.
- (2) Both Assertion & Reason are True but Reason is not a correct explanation of the Assertion.
- (3) Assertion is True but the Reason is False.
- (4) Assertion is False but Reason is True.

174. Parturition is induced by a complex neuro-endocrine mechanism involving many hormones like :-

- (1) hCG, hPL, Estrogen, progesterone
- (2) Relaxin, Prolactin, Progesterone
- (3) Oxytocin, Cortisol, Estrogens
- (4) hCG, LH, Estrogens

175. Which of the following option has hormonal methods of contraception only ?

- (1) Mala-N, Multiload 375, Implants
- (2) Saheli, CuT, Combination pills
- (3) Emergency contraceptive pills
- (4) Diaphragm, CuT, Progestasert

176. Which of the following statement is true for interferons ?

- (1) Secreted by non infected cells
- (2) Protect virus infected cells
- (3) Protect non infected cells
- (4) They are lipid in nature

177. Which type of interferon causes regression of kaposi sarcoma ?

- (1) INF  $\alpha$
- (2) INF  $\beta$
- (3) INF  $\gamma$
- (4) Both INF  $\alpha$  & INF  $\beta$

**178. Assertion :** More and more children in metro cities of India suffer from allergies and asthma.

**Reason :** Modern day life style has resulted in lowering of immunity and more sensitivity to the environment.

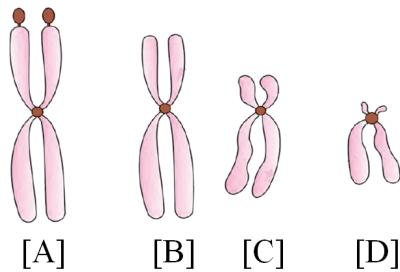
- (1) Both Assertion & Reason are True & the Reason is a correct explanation of the Assertion.
- (2) Both Assertion & Reason are True but Reason is not a correct explanation of the Assertion.
- (3) Assertion is True but the Reason is False.
- (4) Both Assertion & Reason are False.

**179.** Australopithecines probably lived in East African grassland A.

Identify the A in above statement :-

- (1) 1.5 mya
- (2) 2 mya
- (3) 3-4 mya
- (4) 15 mya

**180.** Which one of the following is matched correctly ?



|     | [A]         | [B]            | [C]            | [D]          |
|-----|-------------|----------------|----------------|--------------|
| (1) | Telocentric | Metacentric    | Submetacentric | Acrocentric  |
| (2) | Metacentric | Submetacentric | Telocentric    | Acrocentric  |
| (3) | Metacentric | Submetacentric | Acrocentric    | Telocentric  |
| (4) | Telocentric | Submetacentric | Acrocentric    | Mentacentric |

**181.** Which of the following is not a function of endoplasmic reticulum?

- (1) Provide mechanical support to cell.
- (2) Lipid synthesis
- (3) Formation of ribosomes
- (4) Detoxification

**182. Statement - I:** 23s r-RNA is an example of ribozyme.

**Statement - II :** It help in the formation of peptide bond during lipid synthesis.

Select the right option regarding given statements.

- (1) Statement - I and II both are correct and statement - II is correct explanation of statement - I.
- (2) Statement - I is correct but statement -II is incorrect.
- (3) Statement - II is correct but statement - I is incorrect.
- (4) Statement - I and II both are correct and statement - II is not correct explanation of statement - I.

**183.** Which biomolecule have peptide bonding ?

- (1) Carbohydrate
- (2) Lipid
- (3) Protein
- (4) Nucleic acid

**184.** The substrates for restriction enzyme is -

- (1) Single stranded RNA
- (2) Proteins
- (3) Double stranded DNA
- (4) Single stranded DNA

**185.** Select the correct option -

**Statement-I :-** In animals retrovirus have the ability to transform normal cells into cancerous cells

**Statement-II :-** Presence of one recognition sites for a restriction enzyme within the vector will generate several fragments.

- (1) Statement I & II are correct
- (2) Statement I & II are incorrect
- (3) Statement I is correct but II is incorrect
- (4) Statement I is incorrect but II is correct

## SECTION-B ( ZOOLOGY )

186. Complete the sentence -

" In vector A sequence is responsible for controlling the B of the linked DNA. "

- (1) A - Selectable marker ; B - Copy number
- (2) A - Copy number ; B - Cloning site
- (3) A - Origin of replication ; B - Copy number
- (4) A - Selectable maker ; B - Cloning site

187. The first transgenic cow Rosie, milk contain -

- (1)  $\alpha$  antitrypsin
- (2) Calcitonin
- (3) Penicillin
- (4)  $\alpha$  lactalbumin

188. In which of the following stage of mitosis chromosomes cluster at opposite spindle poles and their identity is lost as discrete elements.

- |              |               |
|--------------|---------------|
| (1) Prophase | (2) Telophase |
| (3) Anaphase | (4) Metaphase |

189. Match the protein given in Column-I with its function given in Column-II and choose the right option.

| Column-I<br>(Protein) |          | Column-II<br>(Functions) |                                  |
|-----------------------|----------|--------------------------|----------------------------------|
| A.                    | GLUT-4   | I                        | Fight Infections agents          |
| B.                    | Collagen | II                       | Inter cellular ground substance` |
| C.                    | Antibody | III                      | Enzyme                           |
| D.                    | Trypsin  | IV                       | Glucose transport                |

- (1) A-IV, B-I, C-III,D-II
- (2) A-II, B-III, C-I,D-IV
- (3) A-IV, B-II, C-I,D-III
- (4) A-II, B-IV, C-I,D-III

190. The glandular tissue of each breast is divided into I containing clusters of cells called II. Find out I and II respectively.

- (1) Alveoli, 15-20 Mammary Lobules
- (2) 15-20 Mammary Lobules, Alveoli
- (3) 15-20 Mammary Lobes, Alveoli
- (4) 15-20 Mammary Lobes, Mammary Lobules

191. In earthworm the body shows A and the phenomenon is known as B.

- (1) A-Metamerism, B-Metameric
- (2) A-Metamerism, B-Segmentation
- (3) A-Metameric segmentation, B-Metamerism
- (4) A-Metamerism, B-Metameric segmentation

192. Head of cockroach is \_\_\_\_\_ in shape and lies anteriorly at right angles to the \_\_\_\_\_ body axis.

- (1) Square, longitudinal
- (2) Circular, longitudinal
- (3) Triangular, longitudinal
- (4) Rectangular, longitudinal

193. \_\_\_\_\_ facilitate the cells to communicate with each other by connecting the \_\_\_\_\_ of adjoining cells ?

- (1) Tight junction, Plasma membrane
- (2) Adhering junction, Cytoplasm
- (3) Gap junction, Cytoplasm
- (4) Cytoplasm, adhering junction

- 194.** Given below are two statement. Choose the correct option.

**Statement-I :-** The right and left atria are separated by a thin muscular wall called interatrial septum.

**Statement-II :-** The valves in the heart allows the flow of blood only in one direction from atria to the ventricles from the ventricles to the arteries.

- (1) Both Statement-I and Statement-II are incorrect.
  - (2) Statement-I is correct but Statement-II is incorrect.
  - (3) Statement-I is incorrect but Statement-II is correct.
  - (4) Both Statement-I and Statement-II are correct.

195. Respiratory organ of scorpion is \_\_\_\_\_.

- (1) Book lungs      (2) Book gills  
(3) Buccal cavity      (4) lungs

- 196.** Fill in the blanks :-

- (i) (A) are responsible for complex functions like memory and communication.

(ii) Along with hypothalamus, (B) is involved in the regulation of sexual behaviour, expression of emotional reactions.

Here A and B respectively.

- (1) Motor area and thalamus
  - (2) Sensory area and Medulla
  - (3) Association area and limbic system
  - (4) Limbic lobe and thalamus

197. Thymosin play a major role in the differentiation of (A) which provides (B) immunity.

- (1) (A) B-lymphocytes, (B) Cell mediated
  - (2) (A) B-lymphocytes, (B) Humoral
  - (3) (A) T-lymphocytes, (B) Cell-mediated
  - (4) (A) T-lymphocytes, (B) Humoral

- 198.** Some steps of the sliding filament theory of muscle contraction are given below. Arrange these steps in a correct sequence.

- (A) Rotation of myosin head
  - (B) New ATP binds to myosin head
  - (C) Release of ADP and Pi from myosin head
  - (D) Breaking of cross bridge

(1) C, A, D, B      (2) A, C, D, B

(3) B, C, A, D      (4) A, C, B, D

- 199.** Which of the following is not bacterial disease-

- (1) Tatanus                          (2) Plague  
(3) Diphteria                        (4) Malaria

- 200. Assertion (A) :** Cancer cells show a property called contact inhibition.

**Reason (R) :** Cancerous cells just continue to divide giving rise to masses of cells called tumors.

- (1) Both A and R are correct but R is NOT the correct explanation of A.
  - (2) A is correct but R is not correct.
  - (3) A is not correct but R is correct.
  - (4) Both A and R are correct and R is the correct explanation of A.



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| Test Date  | PHASE   |    |                       |     |       |    |       |
|------------|---|----|-----------------------|-----|-------|----|-------|
| 26/02/2024 | PRE-MEDICAL : LEADER & ACHIEVER COURSE<br>PHASE - MLA, MLB, MLC, MLQ, MLR, MLS, MLT, MLU, MLV, MAZA, MAZB, MAZC, MAZD, MAZE, MAZF, MAZP, MAZQ & MAZR  | Q. | 105                   |     |       |    |       |
|            |   | A. | 1 & 3                 |     |       |    |       |
| 09/03/2024 | PRE-MEDICAL LEADER & ACHIEVER COURSE<br>PHASE - MLA, MLB, MLC, MLQ, MLR, MLS, MLT, MLU, MLV, MAZA, MAZB, MAZC, MAZD, MAZE, MAZF, MAZP, MAZQ & MAZR  | Q. | 99                    |     |       |    |       |
|            |   | A. | 3 & 4 (Only in Hindi) |     |       |    |       |
| 15/03/2024 | PRE-MEDICAL LEADER & ACHIEVER COURSE<br>PHASE - MLH, MLI, MLJ, MLK, MLM, MLX, MAZG, MAZH, MAZI, MAZJ, MAZL, MAZS, MAZT, MAZU, MAZW  | Q. | 170                   |     | 25    |    |       |
|            |   | A. | 3 (Only in Hindi)     |     | 3     |    |       |
| 21/03/2024 | PRE-MEDICAL LEADER & ACHIEVER COURSE<br>PHASE - MLA, MLB, MLC, MLQ, MLR, MLS, MLT, MLU, MLV, MAZA, MAZB, MAZC, MAZD, MAZE, MAZF, MAZP, MAZQ & MAZR  | Q. | 130                   |     |       |    |       |
|            |   | A. | 2                     |     |       |    |       |
| 26/03/2024 | PRE-MEDICAL LEADER & ACHIEVER COURSE<br>PHASE - MLH, MLI, MLJ, MLK, MLM, MLX, MAZG, MAZH, MAZI, MAZJ, MAZL, MAZS, MAZT, MAZU, MAZW  | Q. | 194                   |     |       |    |       |
|            |   | A. | 2                     |     |       |    |       |
| 27/03/2024 | PRE-MEDICAL LEADER & ACHIEVER COURSE<br>PHASE - MLA, MLB, MLC, MLP, MLQ, MLR, MLS, MLT, MLU, MLV, MAZA, MAZB, MAZC, MAZD, MAZE, MAZF, MAZP, MAZQ, MAZR, MAZV, MAZX, MAZY, MAZK, MAPA, MAPB, MSP1, MSP2, LAKSHYA | Q. | 190                   | 97  |       |    |       |
|            |   | A. | 2,3,4                 | 1   |       |    |       |
| 31/03/2024 | PRE-MEDICAL ENTHUSIAST, LEADER & ACHIEVER COURSE<br>PHASE - ALL ENTHUSIAST, MLA, B, C, E, P, Q, R, S, T, U, V, MAZA, ZB, ZC, ZD, ZE, ZF, ZN, ZP, ZQ, ZR, ZV, ZX, ZY, ZK, MAPA, MAPB, MSP1, MSP2, LAKSHYA        | Q. | 86                    |     |       |    |       |
|            |   | A. | 2, 3                  |     |       |    |       |
| 07/04/2024 | PRE-MEDICAL : LEADER & ACHIEVER COURSE<br>PHASE - MLD, MLW, MLY, MAZM, MAZO, MAAX, MAAY   |    | 60                    |     |       |    |       |
|            |   |    | 4                     |     |       |    |       |
| 08/04/2024 | PRE-MEDICAL ENTHUSIAST, LEADER & ACHIEVER COURSE<br>PHASE - ALL ENTHUSIAST, MLA, B, C, E, P, Q, R, S, T, U, V, MAZA, ZB, ZC, ZD, ZE, ZF, ZN, ZP, ZQ, ZR, ZV, ZX, ZY, ZK, MAPA, MAPB, MSP1, MSP2, LAKSHYA        | Q. | 42                    | 125 | 126   | 71 | 192   |
|            |   | A. | 3 & 4                 | 2   | Bonus | 3  | Bonus |
| 10/04/2024 | PRE-MEDICAL LEADER & ACHIEVER COURSE<br>PHASE - MLD, MLH, MLI, MLJ, MLK, MLM, MLW, MLX, MLY, MAZG, MAZH, MAZI, MAZJ, MAZL, MAZM, MAZO, MAZS, MAZT, MAZU, MAZW, MAAX, MAAY                                       | Q. | 15                    | 128 |       |    |       |
|            |   | A. | 2                     | 3   |       |    |       |

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