



**AIPMT  
AIIMS  
STATE PMT**

**MENTORS EDUSERV ALL INDIA TEST SERIES 2018  
PART TEST - 2  
AIIMS PATTERN TEST**

**Date: 01/12/2017**

**Duration: 3½ Hours.**

**Maximum Marks: 200**

[Please read the instructions carefully. You are allotted 5 minutes specifically for this purpose.]

**This Booklet contains 30 pages.**

**INSTRUCTIONS**

**A. Question paper format:**

1. The question paper consists of **4 parts (Biology, Chemistry, Physics, General Knowledge)**.
2. **Part-I** contains **60** multiple choice questions. Each question has 4 choices (1), (2), (3) and (4) for its answer, out of which **only one is correct**.
3. **Part-II** contains **60** multiple choice questions. Each question has 4 choices (1), (2), (3) and (4) for its answer, out of which **only one is correct**.
4. **Part-III** contains **60** multiple choice questions. Each question has 4 choices (1), (2), (3) and (4) for its answer, out of which **only one is correct**.
5. **Part-IV** contains **20** multiple choice questions. Each question has 4 choices (1), (2), (3) and (4) for its answer, out of which **only one is correct**.

**B. Marking Scheme:**

6. In **Part-I** (Total Marks: 60), for each question you will be awarded **1 marks** if you darken **ONLY** the bubble corresponding to the correct answer and **zero marks** if no bubble is darkened. If you darken bubble corresponding to the wrong answer, **0.33 marks will be deducted**.
7. In **Part-II** (Total Marks: 60), for each question you will be awarded **1 marks** if you darken **ONLY** the bubble corresponding to the correct answer and **zero marks** if no bubble is darkened. If you darken bubble corresponding to the wrong answer, **0.33 marks will be deducted**.
8. In **Part-III** (Total Marks: 60), for each question you will be awarded **1 marks** if you darken **ONLY** the bubble corresponding to the correct answer and **zero marks** if no bubble is darkened. If you darken bubble corresponding to the wrong answer, **0.33 marks will be deducted**.
9. In **Part-IV** (Total Marks: 20), for each question you will be awarded **1 marks** if you darken **ONLY** the bubble corresponding to the correct answer and **zero marks** if no bubble is darkened. If you darken bubble corresponding to the wrong answer, **0.33 marks will be deducted**.

**SEAL**

DO NOT BREAK THE SEAL ON THIS BOOKLET, AWAIT INSTRUCTIONS FROM THE INVIGILATOR.

**Name (in Capitals):**.....

**Roll NO. : in figures:**

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**: in words:**.....

**Centre of Examination (in capitals) :**.....

**Candidate's Signature :.....Invigilator's Signature.....**

**Fascimile signature stamp of**

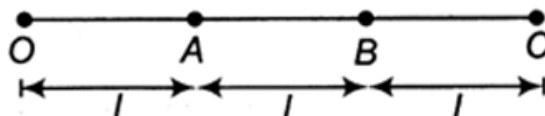
**Centre Superintendent:**.....

## PHYSICS

1. A car is circulating on a circular path of radius  $r$ . At some instant its velocity is  $v$  and rate of increase of speed is  $a$ . The resultant acceleration of the car will be

(A)  $\sqrt{\frac{v^2}{a^2} + r^2}$       (B)  $\sqrt{\frac{v^2}{r} + a}$       (C)  $\sqrt{\frac{v^4}{r^2} + a^2}$       (D)  $\left(\frac{v^2}{r} + a\right)$

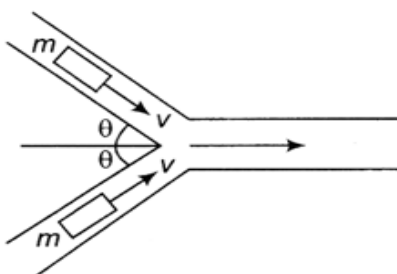
2. Three identical particles are joined together by a thread as shown in figure. All the three particles are moving in a horizontal plane. If the velocity of the outermost particle is  $v_0$ , then the ratio of tensions in the three sections of the strings is



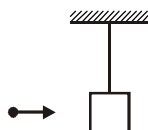
- (A) 3 : 5 : 7      (B) 3 : 4 : 5      (C) 7 : 11 : 6      (D) 3 : 5 : 6
3. A rocket with a lift-off mass  $3.5 \times 10^4$  kg is blasted upwards with an initial net acceleration of  $10 \text{ m/s}^2$ . Then, the initial thrust of the blast is
- (A)  $3.5 \times 10^5$  N      (B)  $7.0 \times 10^5$  N      (C)  $14.0 \times 10^5$  N      (D)  $17.5 \times 10^5$  N
4. A steel ball strikes a steel plate at an angle  $\theta$  with the vertical. If the coefficient of restitution is  $e$ , the angle at which the rebound will take place is

(A)  $\theta$       (B)  $\tan^{-1}\left[\frac{\tan\theta}{e}\right]$       (C)  $e \tan\theta$       (D)  $\tan^{-1}\left[\frac{e}{\tan\theta}\right]$

5. Two vehicles of equal masses are moving with same speed  $v$  on two roads inclined at an angle  $\theta$ . They collide elastically at the junction and, then move together. The speed of the combination is

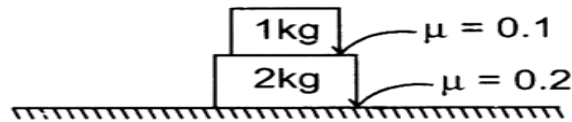


- (A)  $v \cos\theta$       (B)  $2v \cos\theta$       (C)  $\frac{3}{2}v \cos\theta$       (D)  $\frac{v}{2} \cos\frac{\theta}{2}$
6. A mass of 10 g moving horizontally with a velocity of 100 cm/s strikes a pendulum bob of mass 10 g. Length of string is 50 cm. The two masses stick together. The maximum height reached by the system now is ( $g = 10 \text{ m/s}^2$ )



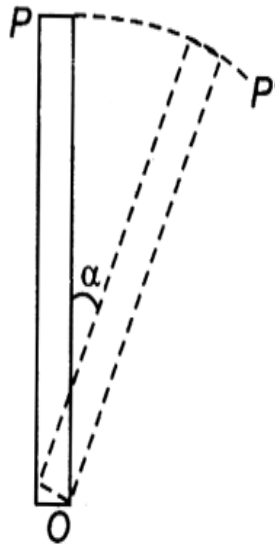
- (A) 7.5 cm                      (B) 5 cm                      (C) 2.5 cm                      (D) 1.25 cm

7. Both the blocks as shown in the given arrangement are given together a horizontal velocity towards right. If  $a_{CM}$  be the subsequent acceleration of the centre of mass of the system of blocks then  $a_{CM}$  equals



- (A) Zero                      (B)  $\frac{5}{3} \text{ m/s}^2$                       (C)  $\frac{7}{3} \text{ m/s}^2$                       (D)  $2 \text{ m/s}^2$

8. A rod of uniform mass and of length  $L$  can freely rotate in a vertical plane about an axis passing through  $O$ . The angular velocity of the rod when it falls from position  $P$  to  $P'$  through an angle  $\alpha$  is

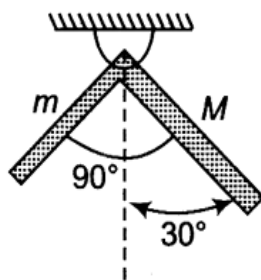


- (A)  $\sqrt{\frac{6g}{5L}} \sin \alpha$                       (B)  $\sqrt{\frac{6g}{L}} \sin \frac{\alpha}{2}$                       (C)  $\sqrt{\frac{6g}{L}} \cos \frac{\alpha}{2}$                       (D)  $\sqrt{\frac{6g}{L}} \sin \alpha$

9. A particle performs uniform circular motion with an angular momentum  $L$ . If the frequency of the particle motion is doubled, the angular momentum becomes

- (A)  $2L$                       (B)  $4L$                       (C)  $\frac{L}{2}$                       (D)  $\frac{L}{4}$

10. Two uniform rods of equal length but different masses are rigidly joined to form an L-shaped body which is then pivoted as shown in figure. If in equilibrium the body is in the shown configuration, ratio  $M/m$  will be

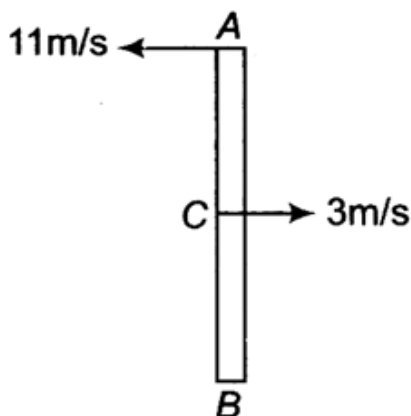


- (A) 2                      (B) 3                      (C)  $\sqrt{2}$                       (D)  $\sqrt{3}$

11. A disc of mass  $m$  and radius  $R$  is rolling on horizontal ground with linear velocity  $v$ . What is the angular momentum of the disc about an axis passing through bottommost point and perpendicular to the plane of motion ?

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

12. A uniform rod AB of length 7 m is undergoing combined rotational and translational motion such that at some instant of time, velocities of its end points A and centre C are both perpendicular to the rod and opposite in direction, having magnitudes 11 m/s and 3 m/s respectively as shown in the figure.



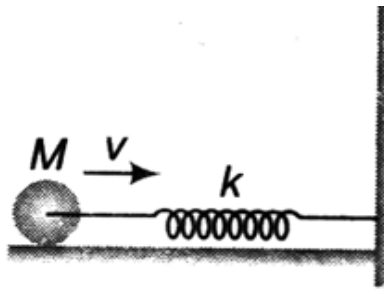
Velocity of centre C and angular velocity of the rod remain constant

- (i) acceleration of point A is  $56 \text{ m/s}^2$
- (ii) acceleration of point B is  $56 \text{ m/s}^2$
- (iii) at the instant shown in the figure acceleration of point B is more than that of point A
- (iv) angular velocity of the rod is  $4 \text{ rad/s}$

Which one of the following is correct

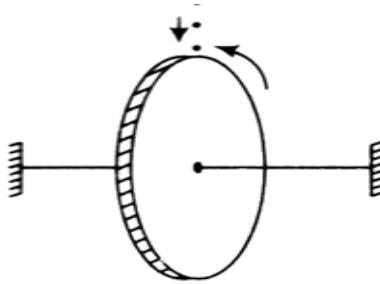
- (A) i, ii and iv                      (B) i, iii and iv                      (C) i and ii                      (D) None of these

13. A solid sphere rolls without slipping and presses a spring of springs constant  $k$  as shown in figure. Then the compression in the spring will be



- (A)  $\sqrt{\frac{2M}{3k}}$       (B)  $\sqrt{\frac{2M}{5k}}$       (C)  $v\sqrt{\frac{5k}{7M}}$       (D)  $v\sqrt{\frac{7M}{5k}}$

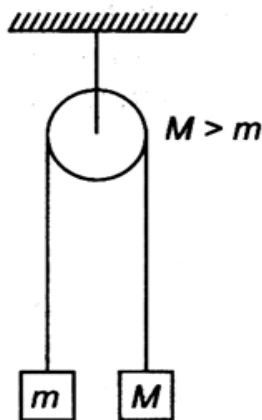
14. A disc of mass  $m_0$  rotates freely about a fixed horizontal axis through its centre. A thin cotton pad is fixed to its rim, which can absorb water ?



The mass of water dripping onto the pad is  $\mu$  per second. After what time will the angular velocity of the disc get reduced to half of its initial value ?

- (A)  $\frac{2m_0}{\mu}$       (B)  $\frac{3m_0}{\mu}$       (C)  $\frac{m_0}{\mu}$       (D)  $\frac{m_0}{2\mu}$

15. The system shown in the figure is released from rest. At the instant when mass  $M$  has fallen through a distance  $h$ , the velocity of  $m$  will be



- (A)  $\sqrt{2gh}$       (B)  $\sqrt{\frac{2ghM}{m}}$       (C)  $\sqrt{\frac{2gh(M-m)}{m+M}}$       (D)  $\sqrt{\frac{2gh(M+m)}{m-M}}$

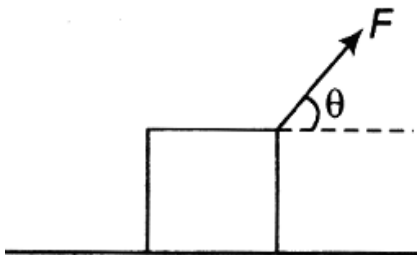
16. A horizontal force  $F$  pulls a 20 kg box at a constant speed along a rough horizontal floor. The coefficient of friction between the box and the floor is 0.25. The work done by force  $F$  on the block in displacing it by 2 m is

- (A) 49 J                      (B) 98 J                      (C) 147 J                      (D) 196 J

17. The net work done by kinetic friction

- (A) is always negative                      (B) is always zero  
(C) may be negative and positive                      (D) is always positive

18. A block of mass  $m$  is pulled along a horizontal surface by applying a force at an angle  $\theta$  with the horizontal. If the block travels with a uniform velocity and has a displacement  $d$  and the coefficient of friction is  $\mu$ , then the work done by the applied force is



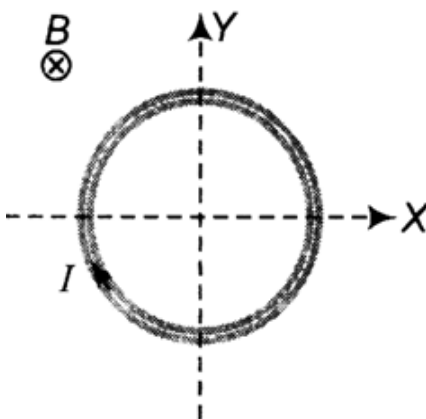
- (A)  $\frac{\mu mgd}{\cos \theta + \mu \sin \theta}$       (B)  $\frac{\mu mgd \cos \theta}{\cos \theta + \mu \sin \theta}$       (C)  $\frac{\mu mgd \sin \theta}{\cos \theta + \mu \sin \theta}$       (D)  $\frac{\mu mgd \cos \theta}{\cos \theta - \mu \sin \theta}$

19. In position A kinetic energy of a particle is 60 J and potential energy is  $-20$  J. In position B, kinetic energy is 100 J and potential energy is 40 J. Then, in moving the particle from A to B

- (i) work done by conservative forces is  $-60$  J  
(ii) work done by external forces is 40 J  
(iii) net work done by all the forces is 40 J  
(iv) net work done by all the forces is 100 J

- (A) i and iii                      (B) ii and iii                      (C) iii and iv                      (D) None of these

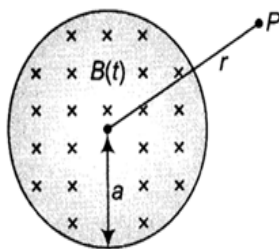
20. A conducting loop carrying a current  $I$  is placed in a uniform magnetic field pointing into the plane of the paper as shown. The loop will have a tendency to



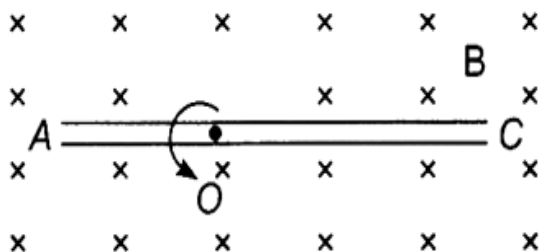
- (A) contract                      (B) expand  
(C) move towards +ve x-axis                      (D) move towards  $-ve$  x-axis

21. If current is passed through a spring, then the spring will

- (A) expand                      (B) compress                      (C) remain same                      (D) None of these
22. A bar magnet is placed in the position of stable equilibrium in a uniform magnetic field of induction  $B$ . If it is rotated through an angle  $180^\circ$ , then the work is ( $M$  = magnetic dipole moment of bar magnet)
- (A)  $MB$                       (B)  $2MB$                       (C)  $\frac{MB}{2}$                       (D) zero
23. Two particles each of mass  $m$  and charge  $q$  are attached to the ends of a light rigid rod of length  $2R$ . The rod is rotated at constant angular speed about a perpendicular axis passing through its centre. The ratio of the magnitudes of the magnetic moment of the system and its angular momentum about the centre of rod is
- (A)  $q/2m$                       (B)  $q/m$                       (C)  $2q/m$                       (D)  $q/\pi m$
24. Which one of the following is a correct statement ?
- (A) Electric field is always conservative  
 (B) Electric field due to a varying magnetic field is conservative  
 (C) Electric field is conservative due to electrostatic charges while non-conservative due to a time varying magnetic field  
 (D) Electric field lines are always closed loops
25. A uniform but time-varying magnetic field  $B(t)$  exists in a cylindrical region of radius  $a$  and is directed into the plane of the paper, as shown. The magnitude of the induced electric field at point  $P$  at a distance  $r$  from the centre of the circular region

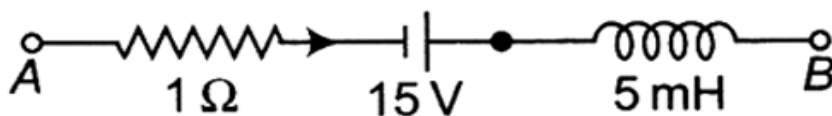


- (A) is zero                      (B) decreases as  $\frac{1}{r}$                       (C) increases as  $r$                       (D) decreases as  $\frac{1}{r^2}$
26. A conducting rod  $AC$  of length  $4\ell$  is rotated about a point  $O$  in a uniform magnetic field  $B$  directed into the paper.  $AO = \ell$  and  $OC = 3\ell$ . Then



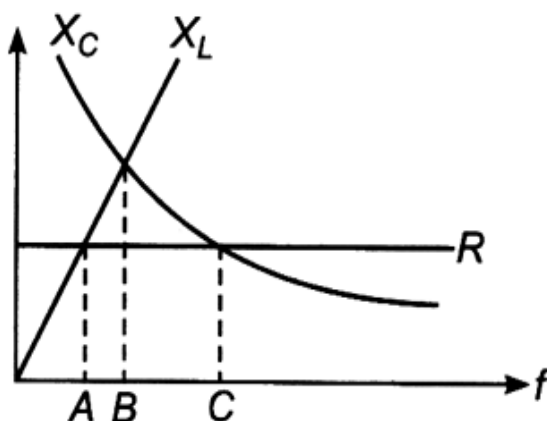
(A)  $V_A - V_O = \frac{B\omega\ell^2}{2}$  (B)  $V_O - V_C = \frac{7}{2}B\omega\ell^2$  (C)  $V_A - V_C = 4B\omega\ell^2$  (D)  $V_C - V_O = \frac{9}{2}B\omega\ell^2 T$

27. The network shown in the figure is a part of a complete circuit. If at a certain instant the current  $I$  is 5 A and decreasing at the rate of  $10^3$  A/s the  $V_B - V_A$  is



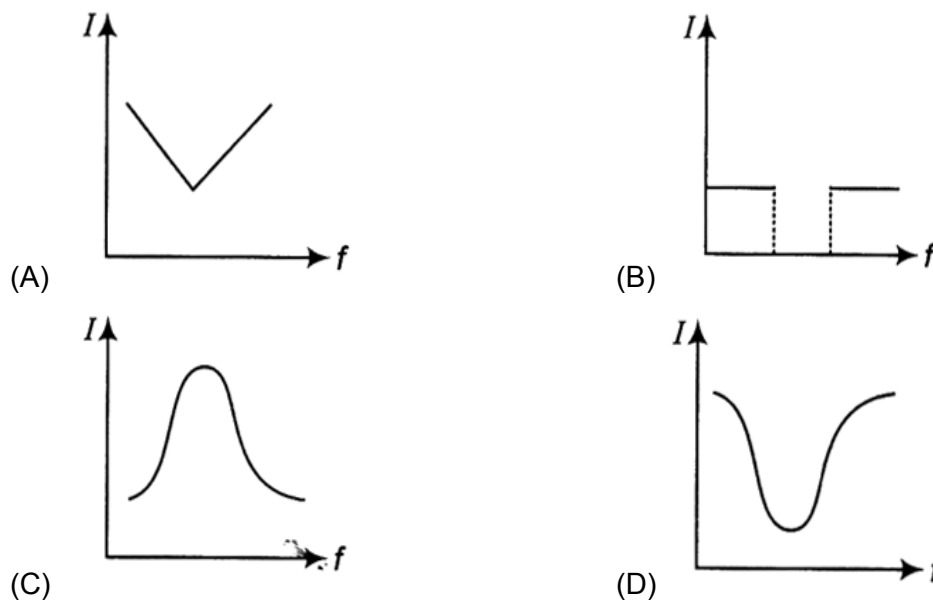
- (A) 5 V (B) 10 V (C) 15 V (D) 20 V

28. The figure shows variation of  $R$ ,  $X_L$  and  $X_C$  with frequency  $f$  in a series L, C, R circuit. Then for what frequency point, the circuit is inductive ?



- (A) A (B) B (C) C (D) All point

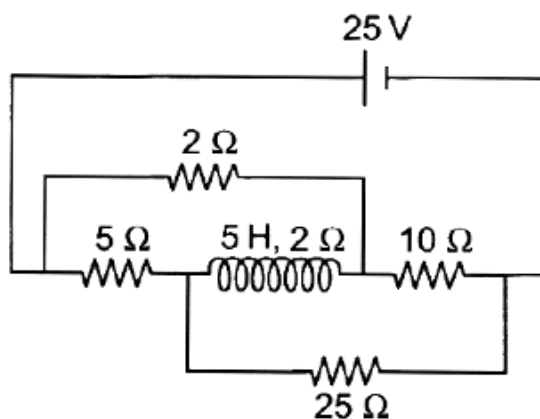
29. An AC source of variable frequency  $f$  is connected to an L-C-R series circuit. Which one of the graphs in figure represents the variation of current  $I$  in the circuit with frequency  $f$  ?





30. In a certain circuit current changes with time according to  $i = 2\sqrt{t}$ . Root mean square value of current between  $t = 2$  to  $t = 4$  s will  
 (A) 3 A (B)  $3\sqrt{3}$  A (C)  $2\sqrt{3}$  A (D)  $\sqrt{3}$  A
31. An AC source of angular frequency  $\omega$  is fed across a resistor  $r$  and a capacitor  $C$  in series. The current registered is  $I$ . If now the frequency of source is changed to  $\frac{\omega}{3}$  (but maintaining the same voltage), the current in the circuit is found to be halved. Calculate the ratio of reactance to resistance at the original frequency  $\omega$   
 (A)  $\sqrt{\frac{3}{5}}$  (B)  $\sqrt{\frac{2}{5}}$  (C)  $\sqrt{\frac{1}{5}}$  (D)  $\sqrt{\frac{4}{5}}$
32. An L-C-R series circuit with a resistance of  $100 \Omega$  is connected to an AC source of  $200$  V (rms) and angular frequency  $300$  rad/s. When only the capacitor is removed, the current lags behind the voltage by  $60^\circ$ . When only the inductor is removed the current leads the voltage by  $60^\circ$ . The average power dissipated in original L-C-R circuit is  
 (A) 50 W (B) 100 W (C) 200 W (D) 400 W
33. The sun delivers  $10^4$  W/m<sup>2</sup> of electromagnetic flux to the earth's surface. The total power that is incident on a roof of dimensions  $(10 \times 10)$ m<sup>2</sup> will be  
 (A)  $10^4$  W (B)  $10^5$  W (C)  $10^6$  W (D)  $10^7$  W
34. The average electric field of electromagnetic waves in certain region of free space is  $9 \times 10^{-4}$  NC<sup>-1</sup>. Then the average magnetic field in the same region is of the order of  
 (A)  $27 \times 10^{-4}$  T (B)  $3 \times 10^{-12}$  T (C)  $\left(\frac{1}{3}\right) \times 10^{-12}$  T (D)  $3 \times 10^{12}$  T
35. A coil having an inductance of  $\frac{1}{\pi}$  henry is connected in series with a resistance of  $300 \Omega$ . If  $20$  V and a  $200$  Hz source are impressed across the combination, the value of the tangent of the phase angle between the voltage and the current is  
 (A)  $\frac{5}{4}$  (B)  $\frac{4}{5}$  (C)  $\frac{3}{4}$  (D)  $\frac{4}{3}$
36. In an AC circuit, a resistance of  $R$  ohm is connected in series with an inductance  $L$ . If phase angle between voltage and current be  $45^\circ$ , the value of inductive reactance will be  
 (A)  $R/4$  (B)  $R/2$  (C)  $R$   
 (D) cannot be found with the given data
37. An L-R circuit has  $R = 10 \Omega$  and  $L = 2$  H. If  $120$  V,  $60$  Hz AC voltage is applied, then current in the circuit will be  
 (A) 0.32 A (B) 0.16 A (C) 0.48 a (D) 0.80 A
38. An emf of  $15$  V is applied in a circuit coil containing  $5$  H inductance and  $10 \Omega$  resistance. The ratio of the currents at time  $t = \infty$  and  $t = 1$  s is  
 (A)  $\frac{e^{1/2}}{e^{1/2} - 1}$  (B)  $\frac{e^2}{e^2 - 1}$  (C)  $1 - e^{-1}$  (D)  $e^{-1}$

39. In the circuit shown what is the energy stored in the coil at steady state ?

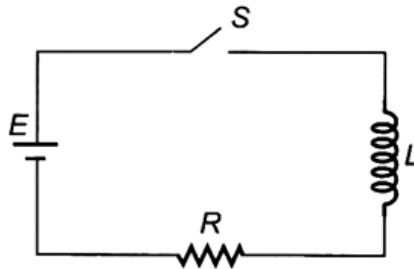


- (A) 21.3 J                      (B) 42.6 J                      (C) Zero                      (D) 213 J
40. Two particles x and y having equal charges, after being accelerated through the same potential difference, enter a region of uniform magnetic field and describe circular path of radius  $R_1$  and  $R_2$  respectively. The ratio of mass of X to that of Y is
- (A)  $\left(\frac{R_1}{R_2}\right)^{1/2}$                       (B)  $\frac{R_2}{R_1}$                       (C)  $\left(\frac{R_1}{R_2}\right)^2$                       (D)  $\frac{R_1}{R_2}$

### Assertion & Reason

These questions consist of two statements, each printed as **Assertion** and **Reason**. While answering these question you are required to choose any one of the following four responses.

- (A) If both **Assertion** and **Reason** are true and the **Reason** is the correct explanation of **Assertion**.
- (B) If both **Assertion** and **Reason** are true but the **Reason** is not the correct explanation of **Assertion**.
- (C) If **Assertion** is true but **Reason** is false.
- (D) If both the **Assertion** and **Reason** are false.
41. **Assertion** : Two concentric conducting rings of different radii are placed in space. The mutual inductance of both the rings is maximum if the rings are coplanar.
- Reason** : For two coaxial conducting rings of different radii, the magnitude of magnetic flux in one ring due to current in other ring is maximum when both rings are coplanar
42. **Assertion** : In the figure, just after closing the switch the potential drop across inductor is maximum.



**Reason** : The rate of change of current just after closing the switch is maximum.

43. **Assertion** : At resonance power factor of L-C-R series circuit is one.

**Reason** : At resonance  $X_C = X_L$

44. **Assertion** : At frequency greater than resonance frequency circuit is inductive in nature.

**Reason** :  $X_L \propto \omega$

45. **Assertion** : In a uniform magnetic field  $B_0 \hat{k}$ , if velocity of a charged particle is  $v_0 \hat{i}$  at  $t = 0$ , then it can have the velocity  $v_0 \hat{j}$  at some other instant.

**Reason** : In uniform magnetic field acceleration of a charged particle is always zero.

46. **Assertion** : A charged particle moves perpendicular to a uniform magnetic field then its momentum remains constant.

**Reason** : Magnetic force acts perpendicular to the velocity of the particle.

47. **Assertion** : At neutral point, a compass needle may point out in any arbitrary direction

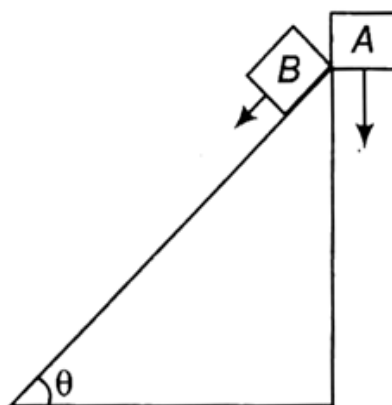
**Reason** : Magnetic field of earth is balanced by field due to magnet at the neutral point.

48. **Assertion** : The earth's magnetic field is due to iron present in its core.

**Reason** : At a high temperature magnet loses its magnetic property of magnetism.

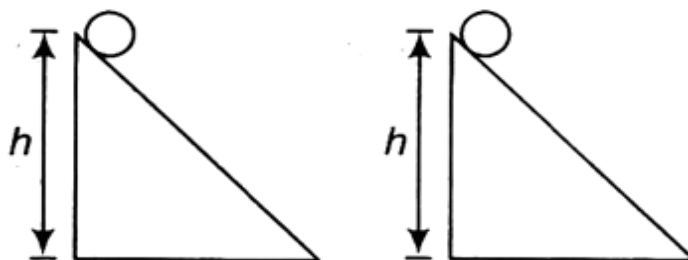
49. **Assertion** : An object A is dropped from the top of an incline at  $t = 0$ , as shown. It will fall under gravity as indicated by the arrow. At the same time i.e.,  $t = 0$ , another object B begins to slide down the frictionless incline.

The two objects during their motion to the ground level will be travelling at equal speeds.

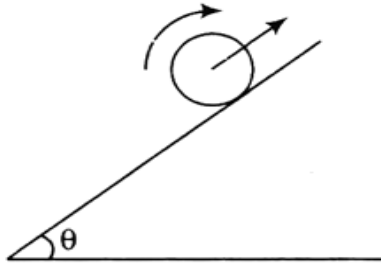


**Reason** : Net force on both the objects during their motion is same.

50. **Assertion** : In projectile motion, the rate of change in magnitude of potential energy of a particle first decreases and then increases during motion.  
**Reason** : In projectile motion, the rate of change in linear momentum of a particle remains constant during motion
51. **Assertion** : One end of a massless rod of length  $l$  is hinged so that it is free to rotate in a vertical plane about a horizontal axis. If a particle is attached to the other end of the rod, then the minimum speed at lower most position of the particle is  $\sqrt{5gl}$  to complete the circular motion.  
**Reason** : Work done by centripetal force on the particle is always zero.
52. **Assertion** : When water in a bucket is whirled fast overhead, the water does not fall out at the top of the circular path.  
**Reason** : The centripetal force in this position on water is more than the weight of water.
53. **Assertion** : In head inelastic collision, the final momentum is less than the initial momentum.  
**Reason** : For inelastic collision,  $0 \leq e < 1$ . Hence, the magnitude of relative velocity of separation after collision is less than relative velocity of approach before collision.
54. **Assertion** : A projectile gets exploded at its highest point. All the pieces get only horizontal velocities. The centre of mass will always fall at a point which is farther than the point where the projectile would have fallen in unexploded condition.  
**Reason** : The weight of the projectile is the external force for projectile.
55. **Assertion** : Angular momentum of sun and planet system about any point remains constant.  
**Reason** : Two equal and opposite forces will act on them. Net torque of those two set of forces about any point is zero.
56. **Assertion** : Two identical spherical balls are released from two inclined plane. First is sufficiently rough and second is smooth. Both the balls will have same kinetic energy on reaching the bottom.



- Reason** : Linear velocity of second ball will be more.
57. **Assertion** : Moment of inertia about an axis passing through centre of mass is always minimum.  
**Reason** : Theorem of parallel axis can be applied for 2-D as well as 3-D bodies.
58. **Assertion** : A sphere is placed in pure rolling condition over a rough inclined surface. Then, force of friction will act in downward direction.

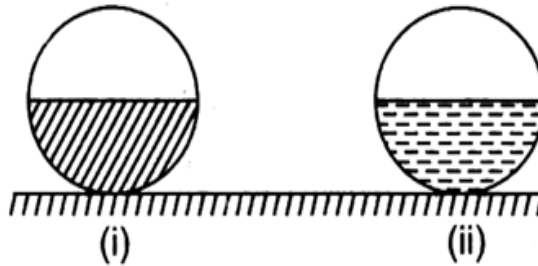


**Reason** : Angular acceleration (actually retardation) due to friction is anticlockwise.

59. **Assertion** : If a projectile explodes in mid air, then no external force acts on the projectile during explosion.

**Reason** : Centre of mass in this case follows the same path

60. **Assertion** : Two identical spherical spheres are half filled with two liquids of densities  $\rho_1$   $\rho_2 (> \rho_1)$ . The centre of mass of both the spheres lie as same level.

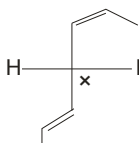


**Reason** : The centre of mass will lie at centre of the sphere.

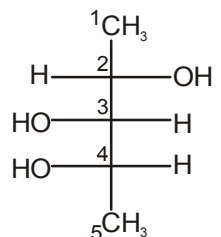
CHEMISTRY

61. Number of stereogenic centre for gives compound is  $\text{CH}_3 - \text{CH} = \text{C} = \text{C} = \text{CH} - \underset{\text{Cl}}{\text{CH}} - \text{CH}_3$

- (A) 5 (B) 4 (C) 3 (D) 2

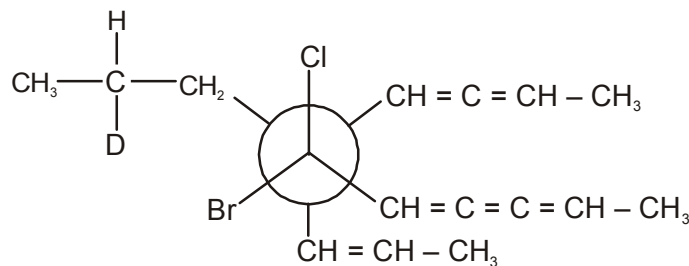
62.  In a given compound C<sup>x</sup> have

- (A) R-configuration (B) S-configuration  
(C) Neither 'R' nor 'S' (D) Achiral centre

63.  C-3 centre is

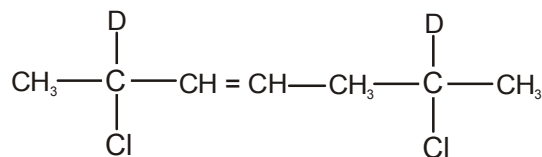
- (A) R-Configuration (B) S-configuration  
(C) Neither 'R' nor 'S' configuration (D) Achiral centre

64. Number of stereoisomer of

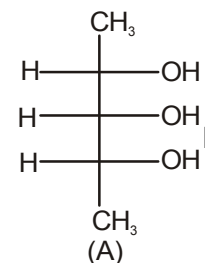


- (A) 2<sup>3</sup> (B) 2<sup>5</sup> (C) 2<sup>4</sup> (D) 2<sup>6</sup>

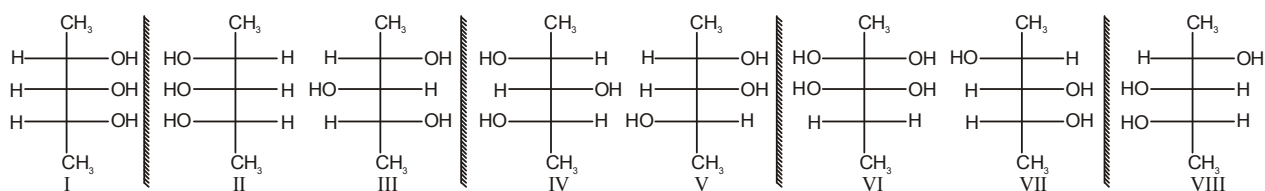
65. Number of stereoisomer of given compound is



- (A) 6 (B) 4 (C) 3 (D) None of these

66.  Have following arrangement

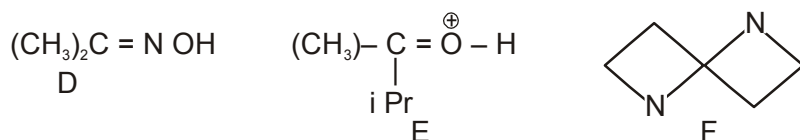
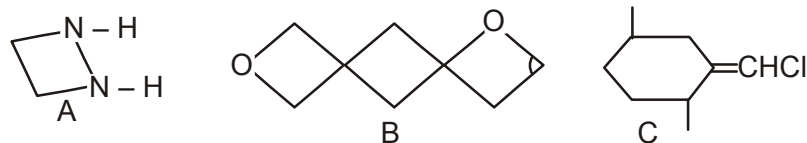
(A)



Which one the following is correct statement

- (A) Molecule 'A' have 8 stereoisomers (B) Molecule 'A' have 6 stereoisomers  
 (C) Molecule 'A' have 4 stereoisomers (D) None of these

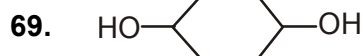
67. Which one of the following can show geometrical isomerism set appropriately



- (A) A, B, C, D (B) A, E, C, D (C) E, C, F (D) None of these

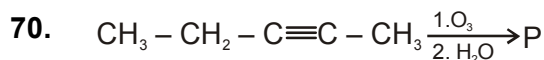
68. Ethane have how many conformational isomers

- (A) 2 (B) 3 (C)  $\infty$  (D) None



For the given structure, how many stereoisomer and how many racemic-mixtures are possible ?

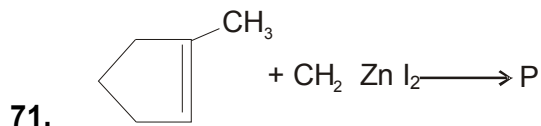
- (A) 2, 1 (B) 4, 2 (C) 4, 0 (D) 3, 0



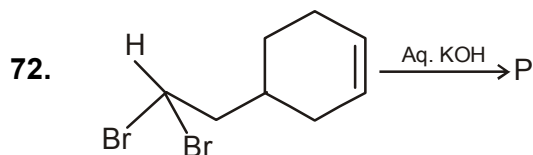
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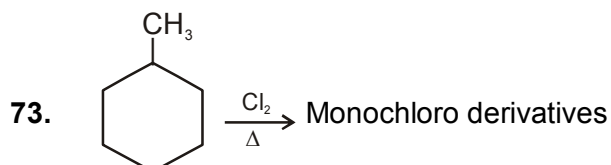
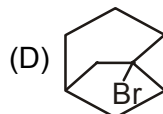
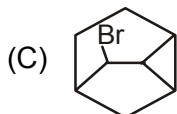
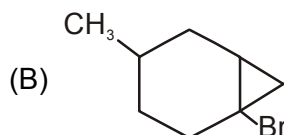
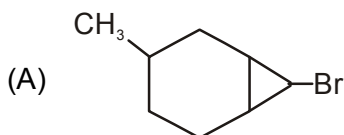
- (A)  $\text{CH}_3 - \text{CH}_2 - \text{CHO} + \text{CH}_3\text{CHO}$  (B)  $\text{CH}_3 - \text{CH}_2 - \text{COOH} + \text{CH}_3\text{COOH}$

- (C)  $\text{CH}_3 - \text{CH}_2 - \overset{\text{O}}{\parallel} \text{C} - \overset{\text{O}}{\parallel} \text{C} - \text{CH}_3$  (D) None of these



- (A) (B)   
 (C) Both in equal proportion (D) None





How many monochloro derivatives will be obtained in this reaction consider stereoisomers

- (A) 5 (B) 10 (C) 12 (D) 14

74. A mixture of 2 moles of CO and 1 mole of O<sub>2</sub> in a closed vessel is ignited to convert to CO into CO<sub>2</sub> then

- (A)  $\Delta H = \Delta U$  (B)  $\Delta H > \Delta U$  (C)  $\Delta H < \Delta U$

(4) The relationship depends upon the capacity of the vessel.

75. Entropy of vaporisation of water at 100°C, if molar heat of vaporisation is 9710 cal mol<sup>-1</sup> will be:

- (A) 20 cal mol<sup>-1</sup> K<sup>-1</sup> (B) 26 cal mol<sup>-1</sup> K<sup>-1</sup> (C) 24 cal mol<sup>-1</sup> K<sup>-1</sup> (D) 28 cal mol<sup>-1</sup> K<sup>-1</sup>

76. Haber's process for the production of ammonia involves the equilibrium N<sub>2</sub>(g) + 3H<sub>2</sub>(g) ⇌ 2NH<sub>3</sub>(g). Assuming that  $\Delta H^\circ$  and  $\Delta S^\circ$  for the reaction does not change with temperature, which of the statements is true

( $\Delta H^\circ = -95$  kJ and  $\Delta S^\circ = -190$  J/K).

- (A) Ammonia dissociates spontaneously below 500 K  
 (B) Ammonia dissociates spontaneously above 500 K  
 (C) Ammonia dissociates at all temperatures  
 (D) Ammonia does not dissociate at any temperature.

77. The latent heat of vaporisation of water at 25°C is 10.5 k cal mol<sup>-1</sup> and the standard heat of formation of liquid water is -68.3 k cal. The enthalpy change of the reaction :

H<sub>2(g)</sub> + O<sub>2(g)</sub> → H<sub>2O(l)</sub> is, therefore

- (A) -57.8 k cal (B) -78.8 k cal (C) 78.8 k cal (D) -47.3 k cal

78. In the system CaF<sub>2</sub>(s) ⇌ Ca<sup>2+</sup> + 2F<sup>-</sup>, if the concentration of Ca<sup>2+</sup> ions is increased by 4 times the equilibrium concentration of F<sup>-</sup> ions will change to :



- (A) 1/2 of the initial value (B) 1/4 of the initial value  
 (C) 2 times of the initial value (D) 4 time of the initial value
79. HI was heated in a sealed tube at 440°C till the equilibrium was reached. HI was found to be 22% decomposed. The equilibrium constant for dissociation is :  
 (A) 0.282 (B) 0.0796 (C) 0.0199 (D) 1.99
80. One mole of nitrogen was mixed with 3 moles of hydrogen in a closed 3L vessel. 20% of nitrogen is converted into NH<sub>3</sub>. Then, K<sub>C</sub> for the  $\frac{1}{2}\text{N}_2 + \frac{3}{2}\text{H}_2 \rightleftharpoons \text{NH}_3$  is :  
 (A) 0.36 L mol<sup>-1</sup> (B) 0.46 L mol<sup>-1</sup> (C) 0.5 mol<sup>-1</sup> L (D) 0.2 mol<sup>-1</sup> L
81. 1.1 mole of A is mixed with 2.2 mole of B and the mixture is then kept in 1-L flask till the equilibrium is attained  $\text{A} + 2\text{B} \rightleftharpoons 2\text{C} + \text{D}$ . At the equilibrium 0.2 mole of C are formed. The equilibrium constant of the reaction is :  
 (A) 0.001 (B) 0.222 (C) 0.003 (D) 0.004
82. The equilibrium constant for the reaction  $\text{Br}_2 \rightleftharpoons 2\text{Br}$  at 500K and 700K are  $1 \times 10^{-10}$  and  $1 \times 10^{-5}$ , respectively. The reaction is :  
 (A) Endothermic (B) Exothermic (C) Fast (D) Slow
83. Which of the following will have nearly equal H<sup>+</sup> concentration ?  
 (i) 100 ml 0.1M HCl mixed with 50 ml water  
 (ii) 50 ml 0.1M H<sub>2</sub>SO<sub>4</sub> mixed with 50 ml water  
 (iii) 50 ml 0.1M H<sub>2</sub>SO<sub>4</sub> mixed with 100 ml water  
 (iv) 50 ml 0.1M HCl mixed with 50 ml water  
 (A) i,ii (B) ii,iii (C) i,iii (D) ii,iv
84. For an acid  
 $\text{CH}_3\text{COOH} + \text{H}_2\text{O} \rightleftharpoons \text{CH}_3\text{COO}^- + \text{H}_3\text{O}^+$ ; K<sub>1</sub> and for a base  
 $\text{CH}_3\text{COO}^- + \text{H}_2\text{O} \rightleftharpoons \text{CH}_3\text{COOH} + \text{OH}^-$ ; K<sub>2</sub> Then.  
 (A) K<sub>1</sub>·K<sub>2</sub>=K<sub>w</sub> (B) log K<sub>1</sub>+log K<sub>2</sub>=log K<sub>w</sub>  
 (C) pK<sub>1</sub>+pK<sub>2</sub>=pK<sub>w</sub> (D) All are correct
85. K<sub>a</sub> and K<sub>b</sub> values of formic acid and ammonium hydroxide are  $2 \times 10^{-4}$  and  $1.8 \times 10^{-5}$ , respectively. An aqueous solution of ammonium formate is :  
 (A) Basic (B) Acidic (C) Neutral (D) Cannot be predicted
86. The pH of a buffer solution prepared by mixing 50 mL of 0.2M CH<sub>3</sub>COOH and 25 ml of CH<sub>3</sub>COONa is 4.8. What is the concentration of CH<sub>3</sub>COONa ? pK<sub>a</sub> of CH<sub>3</sub>COOH is 4.8.

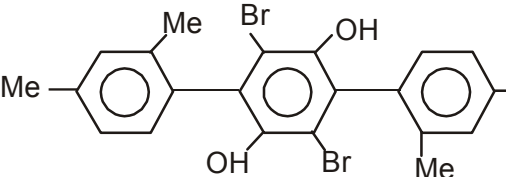
- (A) 4.0 (B) 0.4 (C) 2.0 (D) 0.2
87. True peroxide is :  
 (A)  $\text{NO}_2$  (B)  $\text{MnO}_2$  (C)  $\text{BaO}_2$  (D)  $\text{SO}_2$
88. The correct order of increasing ionic character is :  
 (A)  $\text{BeCl}_2 > \text{MgCl}_2 > \text{CaCl}_2 > \text{BaCl}_2$  (B)  $\text{MgCl}_2 > \text{CaCl}_2 > \text{BeCl}_2 > \text{SrCl}_2$   
 (C)  $\text{BeCl}_2 < \text{MgCl}_2 < \text{CaCl}_2 < \text{BaCl}_2$  (D)  $\text{BeCl}_2 < \text{CaCl}_2 < \text{MgCl}_2 < \text{BaCl}_2$
89. In borax bead test, which component of the bead reacts with basic radical to form metaborate?  
 (A)  $\text{Na}_2\text{BO}_3$  (B)  $\text{B}_2\text{O}_3$  (C)  $\text{NaBO}_2$  (D)  $\text{Na}_2\text{B}_4\text{O}_7$
90.  $\text{H}_3\text{BO}_3$  and  $\text{HBO}_2$  do not differ in  
 (A) Oxidation number (B) Reacting with water  
 (C) Melting point (D) Structure.
91.  $\text{SiCl}_4 + \text{H}_2\text{O} \longrightarrow \text{X} + \text{HCl}$   
 $\text{X} \xrightarrow{1000^\circ\text{C}} \text{Y}$   
 X and Y in the above reactions are  
 (A)  $\text{SiO}_2$  and Si (B)  $\text{H}_4\text{SiO}_4 + \text{SiO}_2$  (C) Si and  $\text{SiO}_2$  (D)  $\text{H}_4\text{SiO}_4 + \text{Si}$
92. In the preparation of  $\text{O}_2$  from  $\text{KClO}_3$ ,  $\text{MnO}_2$  acts as  
 (A) An activator (B) A catalyst (C) An oxidizing agent (D) A retarder
93. The reducing character of hydrides of group IV elements is :  
 (A) Maximum for  $\text{CH}_4$  and minimum for  $\text{PbH}_4$  (B) Maximum for  $\text{CH}_4$  and minimum for  $\text{SnH}_4$   
 (C) Maximum for  $\text{PbH}_4$  and minimum for  $\text{SiH}_4$  (D) Maximum for  $\text{PbH}_4$  and minimum for  $\text{CH}_4$
94. The oxoacid that contains P – O – P bond is :  
 (A) Hypophosphorous acid (B) Pyrophosphoric acid  
 (C) Peroxyphosphoric acid (D) Orthophosphoric acid
95. Which of the following cannot be used as nitrogenous fertilizer ?  
 (A)  $\text{CaNCN}$  (B)  $\text{NH}_4\text{NO}_3$  (C)  $\text{HNO}_3$  (D)  $\text{NH}_2\text{CONH}_2$
96. Arrange the following 'A' is produced by the oxidation of HCN by  $\text{O}_2$  using silver catalyst. Then wrong statement about A is :  
 (A)  $\text{NO}_3^- > \text{NO}_2^+ > \text{NO}_2^-$  (B)  $\text{NO}_3^- > \text{NO}_2^- > \text{NO}_2$   
 (C)  $\text{NO}_2^+ > \text{NO}_2^- > \text{NO}_2$  (D)  $\text{NO}_2^- > \text{NO}_3^- > \text{NO}_2^+$

97. Nitrogen compound 'A' is produced by the oxidation of HCN by O<sub>2</sub> using silver catalyst. Then wrong statement about A is :
- (A) It is linear molecule (B) It is pseudohalogen  
(C) It undergoes disproportion in basic solution  
(D) It cannot be prepared by the action of Cu<sup>2+</sup> and CN<sup>-</sup>
98. The geometry of H<sub>2</sub>S and its dipole moments are
- (A) Angular and non-zero (B) Angular and zero  
(C) Linear and zero (D) Linear and non-zero
99. In which of the following pairs the later will have more boiling point than the former ?
- (A) NH<sub>3</sub>, PH<sub>3</sub> (B) H<sub>2</sub>O, H<sub>2</sub>S (C) HF, HCl (D) H<sub>2</sub>Se, H<sub>2</sub>Te
100. Dioxygen is used in rockets
- (A) As a reductant (B) As a fuel (C) As an oxidant (D) As a bleaching agent

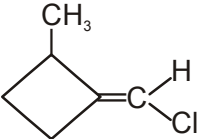
### Assertion & Reason

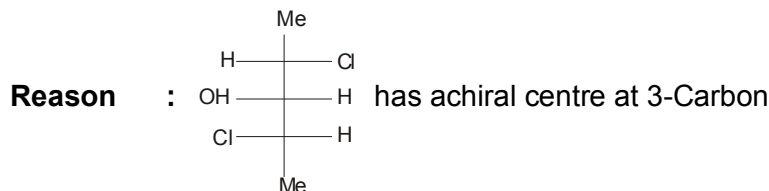
These questions consist of two statements, each printed as **Assertion** and **Reason**. While answering these question you are required to choose any one of the following four responses.

- (A) If both **Assertion** and **Reason** are true and the **Reason** is the correct explanation of **Assertion**.  
(B) If both **Assertion** and **Reason** are true but the **Reason** is not the correct explanation of **Assertion**.  
(C) If **Assertion** is true but **Reason** is false.  
(D) If both the **Assertion** and **Reason** are false.
101. **Assertion** : Cyclo propane show bromine water test  
**Reason** : Cyclo propane have alkene like character due to high angle of strain
102. **Assertion** : Propane have '3' conformational isomers  
**Reason** : Propane have '2' important conformer
103. **Assertion** : Ethane have '3' conformational isomers  
**Reason** : Ethane have '2' important conformer

104. **Assertion** :  is Trans-isomer and optically inactive

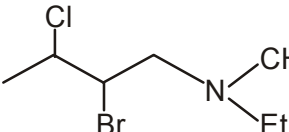
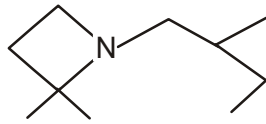
**Reason** : The above compound have centre of inversion and the structure of rigidity

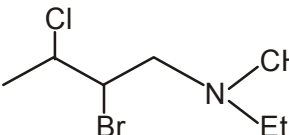
105. **Assertion** :  is optically active and also show G.I.



**106. Assertion** : 1, 2, 3, 4, 5, 6, – hexachlorocyclohexane have 8 stereoisomer

**Reason** : They donot have any enantiomer

**107. Assertion** :  and  have 4 and 4 stereoisomer.

**Reason** :  show inversion

**108. Assertion** : The value of enthalpy of neutralization of weak acid and strong base is numerically less than 57.1 kJ.

**Reason** : All the OH<sup>-</sup> ions furnished by 1g equivalent of strong are not completely neutralized.

**109. Assertion** : Heat sublimation is the sum of heat of fusion and heat of vaporisation.

**Reason** : Heat of reaction or enthalpy change is same whether a reaction takes place in one step (or) in a number of steps.

**110. Assertion** :  $N_2 + 3H_2 \rightleftharpoons 2NH_3$ ;  $\Delta H = -92$  kJ. High pressure favours the formation of ammonia.

**Reason** : Increase of external pressure on the above reaction at equilibrium favours the reaction in the direction in which the number of moles decreases.

**111. Assertion** : Effect of temperature on  $K_c$  or  $K_p$  depends on enthalpy change.

**Reason** : Increase in temperature shifts the equilibrium in exothermic reaction and decrease in temperature shifts the equilibrium position in endothermic reaction.

**112. Assertion** : pH of pure water increases with increase in temperature.

**Reason** : Degree of dissociation increases with increase in temperature.

**113. Assertion** : Aqueous solution of  $CH_3COONH_4$  is found to be neutral.

**Reason** : Because this salt does not undergo hydrolysis.

**114. Assertion** : Equal number of millimoles of  $CH_3COOH$  and NaOH when mixed together the resulting aqueous solution becomes alkaline.

**Reason** : Since the base is stronger, the salt formed undergoes anionic hydrolysis.

115. **Assertion** : In the extraction of Ag, Complex  $\text{Na}[\text{Ag}(\text{CN})_2]$  is reacted with zinc.  
**Reason** : Zn is a d-block metal
116. **Assertion** : Chalcopyrites is concentrated by froth floatation method  
**Reason** :  $\text{CuFeS}_2$  is the chief ore of copper
117. **Assertion** : Fluorine can be produced electrolytically  
**Reason** : Water is oxidized at a much higher potential than fluorine and any fluorine produced will rapidly react with water.
118. **Assertion** : Cl – O bond length decreases from  $\text{ClO}^-$  to  $\text{ClO}_4^-$ .  
**Reason** : Percentage of 's' character in hybrid orbitals decreases from Cl – O<sup>-</sup> to  $\text{ClO}_4^-$
119. **Assertion** : The bond angle in  $\text{PBr}_3$  is greater than  $\text{PH}_3$  but bond angle in  $\text{NBr}_3$  is less than that of  $\text{NH}_3$ .  
**Reason** : Size of Br is less than H
120. **Assertion** : The dipole moment of  $\text{NF}_3$  is less than  $\text{NH}_3$ .  
**Reason** : The presence of lone pair of electrons on nitrogen atom shows an additive contribution in dipole moment of  $\text{NH}_3$  whereas it shows negative contribution towards dipole moment of  $\text{NF}_3$ .



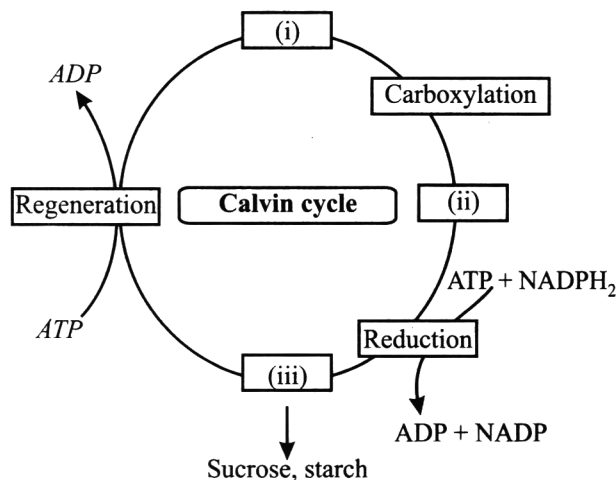
- (1) Mg (p) Found in some amino acid  
 (2) S (q) Structural component of chlorophyll  
 (3) I (r) Not important for plants  
 (4) Mn (s) Required for photolysis of water  
 (A) A-q, B-p, C-r, D-s (B) A-p, B-q, C-r, D-s  
 (C) A-p, B-r, C-s, D-q (D) A-q, B-r, C-p, D-s

125. Leguminous plants are able to fix atmospheric nitrogen through the process of symbiotic nitrogen fixation. Which one of the following statements is not correct during this process of nitrogen fixation ?  
 (A) Leghaemoglobin scavenges oxygen and is pinkish in colour  
 (B) Nitrogenase is insensitive to oxygen.  
 (C) Nodules act as sites for nitrogen fixation.  
 (D) The enzyme nitrogenase catalyses the conversion of atmospheric  $N_2$  to  $NH_3$ .
126. Which of the following changes in concentration of chemicals (RuBP & GP) would occur if an illuminated green plant cell's source of carbon dioxide were removed ?

**Ribulose biphosphate****Glycerate phosphate**

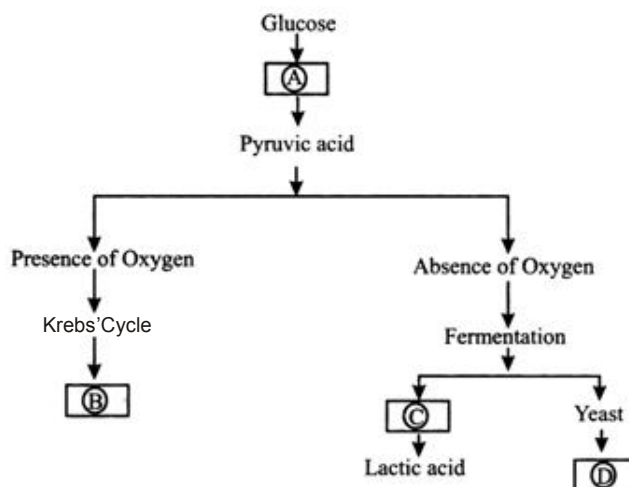
- |              |          |
|--------------|----------|
| (A) increase | increase |
| (B) decrease | decrease |
| (C) increase | decrease |
| (D) decrease | increase |

127. In Kranz anatomy, the bundle sheath cells have  
 (A) thin walls, many intercellular spaces and no chloroplasts.  
 (B) thick walls, no intercellular spaces and large number of chloroplasts.  
 (C) thin walls, no intercellular spaces and several chloroplasts.  
 (D) thick walls, many intercellular spaces and few chloroplasts.
128. Choose the correct combinations of labeling the carbohydrate molecule involved in the Calvin cycle.



- (A) (i) RuBp (ii) PGA (iii) Triose phosphate (B) (i) PGA (ii) RuBP (iii) Triose phosphate  
 (C) (i) PGA (ii) Triose phosphate (iii) RuBP (D) (i) Triose phosphate (ii) PGA (iii) RuBP

129. The given figure shows the fate of glucose during aerobic and anaerobic respiration. Identify the end products that are formed at states indicated as A, B, C and D. Identify the correct option from those given below.



- (A) A = ETS, B = pyruvic acid, C = ethyl alcohol and carbon dioxide, D = lactic acid.  
 (B) A = glycolysis, B = carbon dioxide and water, C = bacteria, D = ethyl alcohol and carbon dioxide.  
 (C) A = pyruvic acid, B = carbon dioxide and water, C = ethyl alcohol and lactic acid, D = fungi.  
 (D) A = ETS, B = ethyl alcohol and carbon dioxide, C = lactic acid, D = carbon dioxide and water.
130. How many ATP will be produced during the production of 1 molecule of acetyl CoA from 1 molecule of pyruvic acid ?  
 (A) 3 ATP (B) 5 ATP (C) 8 ATP (D) 38 ATP
131. Which of the following substances is not an essential component of the tricarboxylic acid cycle ?  
 (A) FAD (B) Succinyl CoA (C) NADP (D) Citric acid
132. Match the growth regulators in column-I with the processes in column-II and choose the correct combination.
- | Column-I                                     | Column-II                                    |
|--|--|
| (a) Auxin                                    | (i) Colouring test in lemon                  |
| (b) Gibberellin                              | (ii) Cell division test in plants            |
| (c) Cytokinin                                | (iii) Avena curvature test                   |
| (d) Ethylene                                 | (iv) Dwarf corn test                         |
| (A) (a)- (iii), (b)-(iv), (c)- (ii), (d)-(i) | (B) (a)- (i), (b)-(iv), (c)- (ii), (d)-(iii) |
| (C) (a)- (ii), (b)-(i), (c)- (iv), (d)-(iii) | (D) (a)- (ii), (b)-(i), (c)- (iv), (d)-(iii) |
133. Etiolation in plants is caused when  
 (A) they have mineral deficiency. (B) they are grown in dark.  
 (C) they are grown in intense light. (D) they are grown in blue light.



134. Match the following columns and choose the correct option.

**Column I****Column II**

- |  |              |
|--|--------------|
| 1. Coleorhiza  | I. Grapes    |
| 2. Food storing tissue   | II. Mango    |
| 3. Parthenocarpic fruit  | III. Maize   |
| 4. Single seeded fruit developing from monocarpellary superior Ovary | IV. Radicle  |
| 5. Membranous seed coat  | V. Endosperm |

- |          |          |          |          |          |
|----------|----------|----------|----------|----------|
| <b>1</b> | <b>2</b> | <b>3</b> | <b>4</b> | <b>5</b> |
| (A) III  | I        | IV       | II       | V        |
| (B) IV   | II       | V        | I        | III      |
| (C) V    | I        | III      | IV       | II       |
| (D) IV   | V        | I        | II       | III      |

135. For artificial hybridization experiment in bisexual flower, which of the sequences is correct ?

- (A) Bagging → Emasculation → Cross Pollination → Rebagging  
 (B) Emasculation → Bagging → Cross Pollination → Rebagging  
 (C) Cross pollination → Bagging → Emasculation → Rebagging  
 (D) Self-pollination → Bagging → Emasculation → Rebagging

136. Which of the following is false ?

- (1) Endosperm formation starts prior to division of zygote.  
 (2) Angiospermic endosperm is mostly 3N while gymnospermic one is N.  
 (3) The most common type of endosperm is nuclear.  
 (4) Coconut has both liquid nuclear (multinucleate) and cellular endosperm.  
 (5) Milky water of green tender coconut is liquid female gametophyte.  
 (A) 1 and 2 only      (B) 3 only      (C) 5 only      (D) 2 only

137. Match the following and choose the correct option –

**Column-A****Column-B**

- |                                  |                            |
|----------------------------------|----------------------------|
| 1. ABO blood groups              | p. Dihybrid cross          |
| 2. Law of segregation            | q. Monohybrid cross        |
| 3. Law of Independent assortment | r. Base pairs substitution |
| 4. Gene mutation                 | s. Multiple allelism       |
- (A) 1 – q, 2 – p, 3 – s, 4 – r      (B) 1 – s, 2 – p, 3 – q, 4 – r,  
 (C) 1 – s, 2 – q, 3 – p, 4 – r,      (D) 1 – q, 2 – r, 3 – s, 4 – p,

138. Position of a gene on chromosome is called

- (A) locus      (B) factor      (C) cistron      (D) nucleosome

139. Wobble hypothesis establishes  
(A) Peptide chain formation (B) Initiation of peptide chain  
(C) Termination of peptide chain (D) Economy in tRNA molecules.
140. Methyl guanosine triphosphate is added at 5' end of hn RNA in a process of  
(A) Tailing (B) Splicing (C) Capping (D) None of these
141. Bones of pelvic girdle forms a cavity in which head of the femur is fitted are  
(A) Ilium only (B) Ilium and ischium  
(C) Ilium, ischium, and pubis (D) Ischium and pubis
142. Sutural joints are present between  
(A) Thumb and metatarsal (B) Humerus and radio-ulna  
(C) Parietals of skull (D) Glenoid cavity and pectoral girdle
143. Myoglobin occurs more in  
(A) White muscle fibers (B) Red muscle fibers  
(C) Involuntary muscles (D) All the above
144. EDTA injected into muscles combines with  $Ca^{2+}$  and  
(A) Stops contraction (B) Causes contraction  
(C) Slows down contraction (D) None of the above
145. In the presence of  $Ca^{2+}$  channel blockers, which of the following will be true ?  
(A) Neurotransmitter is released but the  $Na^+$  channel of post-synaptic neuron will not open.  
(B) Neurotransmitter is not released but the  $Na^+$  channel of post-synaptic neuron will open up.  
(C) Neurotransmitter is released but the  $K^+$  channel of post-synaptic neuron opens up.  
(D) Neither neurotransmitter is released nor the  $Na^+$  channel of post-synaptic neuron open up.
146. Highly vascular and closely investing protective coat around brain is known as  
(A) Arachnoid (B) Pia mater (C) Dura mater (D) Sub-arachnoid space
147. Which part of brain is involved in organizing the behavior of an organism related to its survival ?  
(A) Amygdala lobe (B) Cerebral cortex (C) Corpus callosum (D) Hypothalamus
148. Which part of the limbic system converts information from short-term to long-term memory, essential in learning ?  
(A) Amygdala (B) Basal ganglia (C) Hippocampus (D) Hypothalamus
149. Which part is involved in the movement of head to locate and detect the source of a sound ?  
(A) Superior colliculi (B) Inferior colliculi (C) Pons (D) Medulla oblongata
150. Basal ganglion is a collection of subcortical nuclei in the forebrain, at the base of the cortex. A primary function of the basal ganglia is  
(A) Sensory integration (B) Short term memory  
(C) Planning stereotyped movements (D) Neuroendocrine control
151. Which part of the brain is like a defense castle controlling moods and plays an important role in emotional behavior such as aggression and remembering fear ?

- (A) Hippocampus (B) Amygdala (C) Limbic system (D) Thalamus
152. The disproportionate growth of bones of body parts due to the over secretion of GH after adolescence is known as  
(A) Gigantism (B) Acromegaly (C) Dwarfism (D) None of these
153. On the surgical removal of pituitary gland, there is a fall of sodium level and rise in potassium in serum. This is because  
(A) Oxytocin is longer available from pituitary (B) Atrophy of adrenal medulla  
(C) Atrophy of adrenal cortex (D) LTH from pituitary is longer available
154. Symptoms such as pot-bellied, pigeon-like chest, protruding tongue, and mental retardation are of  
(A) Myxedema (B) Cretinism  
(C) Cushing's syndrome (D) Addison's disease
155. After receiving a hormonal shot, an asthma patient will get relief in exhaling the air. The hormone injected with be  
(A) Oxytocin (B) Adrenalin (C) Insulin (D) Thyroxine
156. On of the following symptoms pertain to Addison's disease.  
(A) Low plasma  $\text{Na}^+$ , high plasma  $\text{K}^+$ , increased urinary  $\text{Na}^+$ , low blood sugar, vomiting, nausea, and diarrhea.  
(B) High blood sugar, obesity, wasting of limb muscles, fall in plasma  $\text{K}^+$ , high blood  $\text{Na}^+$ , rise in blood volume, and high blood pressure.  
(C) Stunted growth, retarded sexual development, and mental backwardness.  
(D) Increase heart beat, rise in blood pressure, nervousness, bulging eyes, and warm skin.
157. The secondary messenger which show antagonistic effect to c-AMP in heart muscle is  
(A)  $\text{Ca}^{2+}$  (B) Inositol triphosphate ( $\text{IP}_3$ )  
(C) DAG (D) c-GMP
158. Production, secretion, and ejection of milk requires the synergistic effects of prolactin and  
(A) Estrogen (B) Progesterone (C) Oxytocin (D) All of these
159. Which of the following hormones is used in transplantation surgery to suppress immunity, and thus, chances of organ rejection by recipient's body is decreased ?  
(A) Thyroxine (B) Cortisol (C) Aldosterone (D) Steroid hormone
160. Which of the following character is not related to adrenal virilism ?  
(A) Male-type external sex characters in female  
(B) Deep voice  
(C) Gynecomastia  
(D) Appearance of beard and moustaches

### Assertion & Reason

These questions consist of two statements, each printed as **Assertion** and **Reason**. While answering these questions you are required to choose any one of the following four responses.

- (A) If both **Assertion** and **Reason** are true and the **Reason** is the correct explanation of **Assertion**.
- (B) If both **Assertion** and **Reason** are true but the **Reason** is not the correct explanation of **Assertion**.
- (C) If **Assertion** is true but **Reason** is false.
- (D) If both the **Assertion** and **Reason** are false.
161. **Assertion** : Osmotic potential is always positive in a turgid cell.  
**Reason** : Osmotic pressure becomes equal to wall pressure in a flaccid cell.
162. **Assertion** : Loading of sucrose in to sieve tube elements is an active process.  
**Reason** : During opening of stomata  $K^+$  – comes inside the subsidiary cell.
163. **Assertion** : Na–EDTA Act as chelating agent.  
**Reason** : Symptoms of mobile elements first appear in mature leaves.
164. **Assertion** : PS-II participates during cyclic-ETS.  
**Reason** : PS-II participates during cyclic and non-cyclic ETS.
165. **Assertion** : R.Q value is less than one is the compound rich in oxygen.  
**Reason** : Fatty acid requires less  $O_2$  for their breakdown.
166. **Assertion** : Auxin promotes apical dominance.  
**Reason** : Cytokinin promotes lateral branch formation.
167. **Assertion** : Aleurone layer is triploid structure.  
**Reason** : Aleurone layer is a part of endosperm.
168. **Assertion** : Cleistogamous flower promotes allogamy.  
**Reason** : Self-In compability prevents allogamy.
169. **Assertion** : Atavism is exception to blending inheritance.  
**Reason** : Sickle cell anaemia is controlled by sex-chromosomal gene.
170. **Assertion** : The process of capping occurs in prokaryotes.  
**Reason** : Genetic code is ambiguous generally.
171. **Assertion** : Diabetes insipidus is marked by excessive urination and too much thirst for water.  
**Reason** : Anti-diuretic hormone (ADH) is released by the posterior lobe of pituitary gland.
172. **Assertion** : Thyroxine shows calorogenic effect.  
**Reason** : Thyroxine increases catabolism, produces energy and increases body temperature
173. **Assertion** : Vasopresin is also called as antidiuretic hormone.  
**Reason** : Vasopression reduces the loss of water in urine by increasing water reabsorption in nephrons.
174. **Assertion** : Adrenal cortex is called the gland for “fight, fright, and flight.”  
**Reason** : The hormones of it adrenaline and nor-adrenaline help the body to combat against stress and emergency conditions.

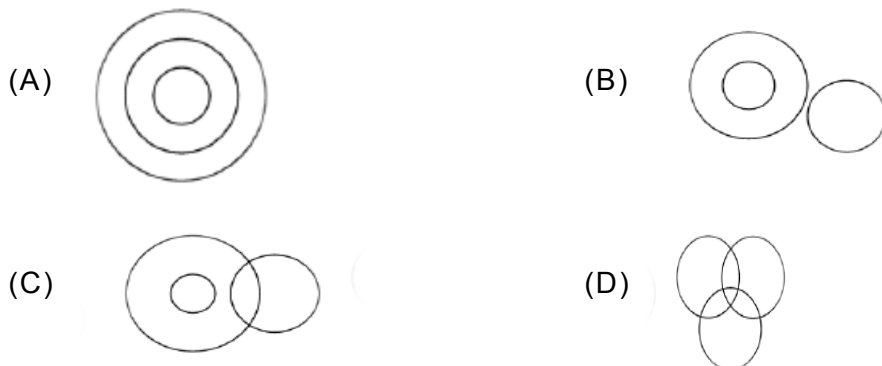
175. **Assertion** : The sharpest vision is in fovea centralis.  
**Reason** : The relationship of receptor to bipolar cells to ganglion cells is 1 : 1 : 1 within fovea centralis.
176. **Assertion** : Presence of myelin sheath increases the rate of conduction of nerve impulse.  
**Reason** : Ionic channels are absent in the area covered by myelin sheath. Therefore, depolarization occurs only at the nodes or Ranvier, resulting in saltatory or jumping conduction.
177. **Assertion** : The postganglionic nerve fiber of parasympathetic nervous system has acetylcholine as the neurotransmitter.  
**Reason** : Sympathetic nervous system inhibits the intestinal peristalsis while parasympathetic stimulates peristalsis.
178. **Assertion** : Corpus callosum is present in the space between the pia and arachnoid maters.  
**Reason** : It serves to maintain a constant pressure inside the cranium.
179. **Assertion** : The auditory ossicles help in hearing.  
**Reason** : Auditory ossicles maintain the balance of air pressure between two sides of the eardrum.
180. **Assertion** : Blind spot on the retina of the eye is devoid of the ability for vision.  
**Reason** : The photoreceptor cone cells and rod cells are absent at the blind spot.

### GENERAL KNOWLEDGE

181. P is the brother of D. X is the sister of P. A is the brother of F. F is the daughter of D. M is the father of X. Who is the uncle of A?

(A) X                      (B) P                      (C) F                      (D) M

182. Which one of the following Venn diagrams best illustrates the three classes: Rhombus, Quadrilaterals, Polygons?



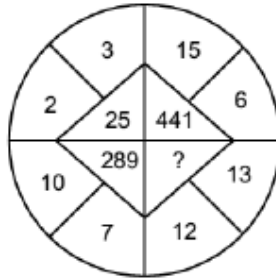
183. If the first and third letters in the word NECESSARY were interchanged, also the fourth and the sixth letters, and the seventh and the ninth letters which of the following would be the seventh letter from the left?

(A) A                      (B) Y                      (C) R                      (D) E

184. If A means ?, B means ?, C means ? and D means ?, then  $15 B 3 C 24 A 12 D 2$  is equal to

- (A) 34                      (B) 2                      (C)  $\frac{5}{9}$                       (D) none of these

185. Find the missing character (?) in the figure, from among the given alternatives.



- (A) 625                      (B) 25                      (C) 125                      (D) 156

186. Concert is related to Theatre in the same way as Banquet is related to

- (A) Hotel                      (B) Party                      (C) Feast                      (D) Supper

187. Find the missing number in the series; 3, 12, 27, 48, 75, 108, (.....)

- (A) 147                      (B) 162                      (C) 183                      (D) 192

188. If 'ski rps tri' stands for 'nice Sunday morning'; 'teh sti rps' stands for 'Every Tuesday morning' and 'ski ptr qlm' stands for 'nice market place', what would 'Sunday' stand for?

- (A) ski                      (B) rps                      (C) tri                      (D) qlm

189. Pointing to a photograph, a lady tells Pramod, "I am the only daughter of this lady and her son is your maternal uncle." How is the speaker related to Pramod's father?

- (A) sister-in-law                      (B) wife  
(C) either (A) or (B)                      (D) neither (A) nor (B)

190. A is 3 years older than B and 3 years younger to C, while B and D are twins. How many years older is C than D?

- (A) 3                      (B) 6                      (C) 2                      (D) equal in age

191. India's main land extends between

- (A) Latitudes 8.40 N and 37.60 N and longitudes 68.70 E and 97.250 E

- (B) Latitudes 8.40 N and 37.60 N and longitudes 69.70 E and 99.250 E  
(C) Latitudes 9.40 N and 38.60 N and longitudes 68.70 E and 97.250 E  
(D) None of these

**192.** Which of the following rivers does not originate from the Himalayas?

- (A) The Yamuna (B) The Gandak (C) The Narmada (D) The Kosi

**193.** When was the wild life protection act implemented in India?

- (A) 1970 (B) 1971 (C) 1972 (D) 1973

**194.** When did the first train steam off in India?

- (A) 1850 (B) 1851 (C) 1852 (D) 1853

**195.** Which was the first port to be developed after independence?

- (A) Marmagao (B) Jawaharlal Nehru Port  
(C) Kandla (D) Kochi

**196.** When was Gandhi – Irwin Pact signed?

- (A) 5 March 1931 (B) 15 March 1931  
(C) 25 March 1931 (D) 5 March 1932

**197.** Bombay was first under whose control?

- (A) Portuguese (B) English (C) French (D) Dutch

**198.** Who said 'Printing is the ultimate gift of God and the greatest one'?

- (A) E.V. Ramaswamy Maicker (B) Bal Gangadhar Tilak  
(C) Martin Luther (D) Erasmus

**199.** Who is the Chairman of Nitti Ayog.

- (A) Arun Jately (B) Narendra Modi  
(C) Shushma Swraj (D) Ravi Shankar Prasad

**200.** Who is Miss World of 2017

- (A) Christna Gomej (B) Nupur Sharma  
(C) Wilkins Tayler (D) Manushi Chhilar