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MM : 720

PRACTICE TEST-05

Time : 180 Min.

Topics Covered:**Physics:** Work, Energy & Power, System of Particles & Rotational Motion**Chemistry:** Chemical Bonding and Molecular Structure**Botany:** Biological Classification**Zoology:** Breathing & Exchange of Gases-II (Up to disorders), Body Fluids & Circulation**General Instructions :**

Duration of Test is 3 hrs.

The Test consists of 180 questions. The maximum marks are 720.

There are four parts in the question paper consisting of Physics, Chemistry, Botany and Zoology having 45 questions in each part of equal weightage.

Each question carries +4 marks. For every wrong response, -1 mark shall be deducted from the total score. Unanswered/unattempted questions will be given no marks.

Use blue/black ballpoint pen only to darken the appropriate circle.

Mark should be dark and completely fill the circle.

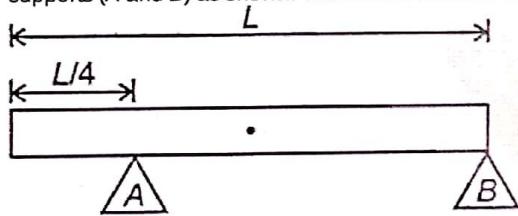
Dark only one circle for each entry.

Dark the circle in the space provided only.

Rough work must not be done on the Answer sheet and do not use white fluid or any other rubbing material on the Answer sheet.

PHYSICS

1. A uniform rod of mass M and length L is balanced using two supports (A and B) as shown. The normal reaction at B is



(1) $\frac{Mg}{3}$

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(2) $\frac{Mg}{2}$

(3) $\frac{2Mg}{3}$

(4) $\frac{Mg}{4}$

2. A particle of mass m is moving with speed v_0 along a line $y = 2x + 4$. Angular momentum of particle about origin is

(1) Continuously increasing

(2) Continuously decreasing

(3) Remains constant

(4) Zero

3. A body of mass 4 kg moves under a force and its displacement is given by the equation, $s = \frac{t^4}{4}$, where s is in meter and t is in second. Work done by the force in first 2 seconds will be

(1) 64 J

(2) 128 J

(3) 256 J

(4) 512 J

4. Power (P) applied to a particle varies with time (t) as $P = (2t + 4)$ watt, where t is in second. The change in its kinetic energy from $t = 1$ second to $t = 2$ second is

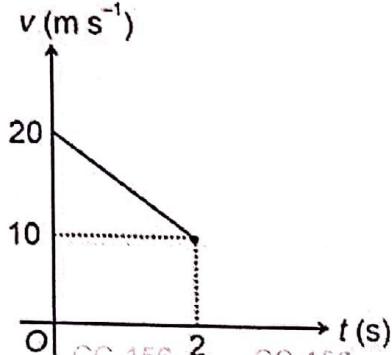
(1) 6 J

(2) 8 J

(3) 17 J

(4) 7 J

5. The velocity-time graph of a particle of mass 4 kg moving in a straight line is shown below. Work done by all the forces in 2 seconds is



- (1) -600 J
 (2) +600 J
 (3) -1200 J
 (4) +1200 J

6. Work done by frictional force

- (1) Always negative
 (2) Always positive
 (3) May be positive, negative or zero
 (4) Is zero

7. Given below are two statements: one is labelled as Assertion A and the other is labelled as Reason R.
Assertion (A): The work done by conservative force during a round trip is zero.

Reason (R): No force is required to move a body in its round trip.

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

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

8. The force acting on a body is given by $\vec{F} = (xi + yj) \text{ N}$.

The work done in displacing it from (1, 1) to (4, 4) is

- (1) 9 J
 (2) 15 J
 (3) 10 J
 (4) 2 J

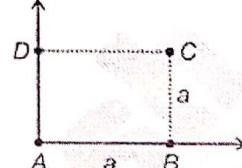
9. A body of mass 1 kg falls from a height of 30 m. If it reaches the ground with speed 20 m/s, then work done by air resistance is

- (1) -100 J
 (2) -200 J
 (3) -300 J
 (4) -150 J

10. A projectile of mass m is projected at an angle θ with horizontal with a speed u . The work done by gravity from point of projectile to maximum height is

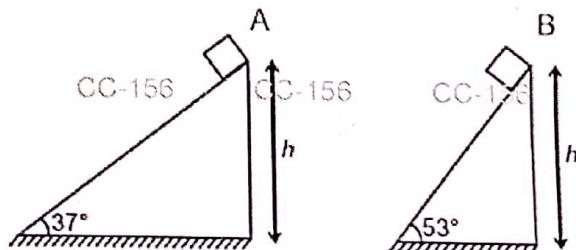
- (1) $\frac{mu^2 \sin^2 \theta}{2}$
 (2) $-\frac{mu^2 \sin^2 \theta}{2}$
 (3) $2mu^2 \sin^2 \theta$
 (4) $-2mu^2 \sin^2 \theta$

11. Four particles, each of mass ' m ' are situated at the vertices of a square ABCD of side ' a ' as shown in the figure. The moment of inertia of the system about line BD will be



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

12. Two blocks A and B of same mass are released from top of two different smooth inclined planes as shown in figure. If the heights of both the inclined planes is same, then the work done by gravity, by the time both blocks reach the bottom of respective inclines, is



- (1) Same for both blocks
 (2) Greater for block A
 (3) Greater for block B
 (4) Negative for both blocks

13. A man weighing 60 kg lifts a body of mass 15 kg to the top of 10 m high building in 2 minute. The efficiency of man is

(1) 10%
 (2) 20%
 (3) 30%
 (4) 25%

14. If the momentum of a body is increased by 20%, then the percentage increase in its kinetic energy will be

(1) 44%
 (2) 66%
 (3) 40%
 (4) 20%

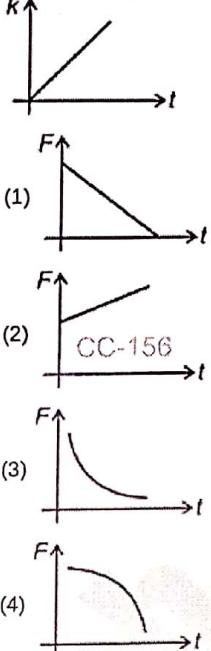
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 15. A : Internal force can change the KE of a system.
 R : Internal force cannot change the momentum of system.

- (1) Both Assertion & Reason are true and the reason is the correct explanation of the assertion
 (2) Both Assertion & Reason are true but the reason is not the correct explanation of the assertion
 (3) Assertion is true statement but Reason is false
 (4) Both Assertion and Reason are false statements

16. When a spring is stretched by 1 cm, it stores energy 50 J. If it is further stretched by 1 cm, the stored energy will increase by

(1) 50 J
 (2) 100 J
 (3) 150 J
 (4) 200 J

17. A particle is moving on a straight line path. Its kinetic energy-time graph is shown in figure. Then corresponding force-time graph is



18. A bullet of mass 'm' moving with a horizontal velocity 'v' strikes a stationary block of mass 'M' suspended by a string of length 'l' and gets embedded in the block. The maximum angle θ ($0 < \theta < 90^\circ$) made by the string with the vertical after impact is

$$(1) \cos^{-1} \left[1 - \frac{m^2 v^2}{2gl(m+M)^2} \right]$$

$$(2) \cos^{-1} \left[\frac{m^2 v^2}{2gl(m+M)^2} - 1 \right]$$

$$(3) \tan^{-1} \left[1 - \frac{m^2 v^2}{2gl(m+M)^2} \right]$$

$$(4) \sin^{-1} \left[1 - \frac{m^2 v^2}{2gl(m+M)^2} \right]$$

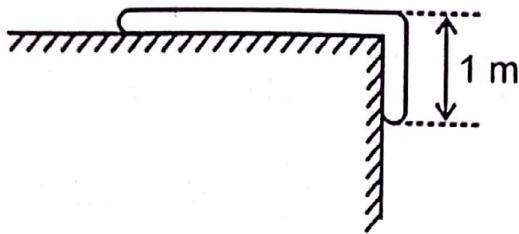
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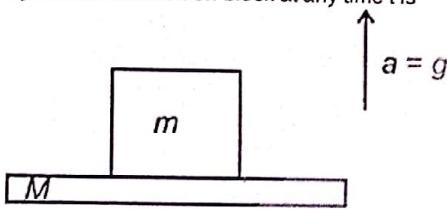
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19. One meter, of a uniform rope of length 3 m, is hanging over the edge of a smooth table as shown in figure. On releasing the rope, velocity with which it just leaves the table completely is



- (1) $\sqrt{\frac{50}{3}} \text{ m/s}$
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 (2) $\sqrt{\frac{80}{3}} \text{ m/s}$
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 (3) $\sqrt{\frac{40}{3}} \text{ m/s}$
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 (4) $\sqrt{\frac{20}{3}} \text{ m/s}$

20. A block of mass m is kept on a platform of mass M . The platform starts from rest with constant acceleration g vertically upward direction, as shown. The power delivered by normal reaction on block at any time t is



- (1) $2mg^2t$
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 (2) $4mg^2t$
 CC-156
 (3) $4mgt$
 CC-156
 (4) $2mgt$

21. A uniform chain of mass M and length L is placed on table such that $\frac{1}{4}$ th part of its length is hanging. The amount of work done in bringing this hanging part onto the table is

- (1) $\frac{Mg\frac{L}{4}}{32}$
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 (2) $\frac{MgL}{64}$
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 (3) $\frac{MgL}{8}$
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 (4) $\frac{MgL}{16}$

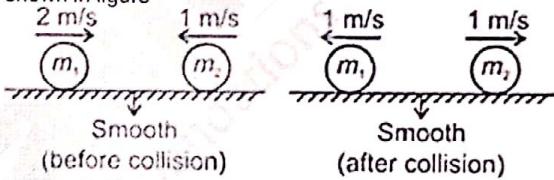
22. The potential energy of a 1 kg particle free to move along x -axis is given by $U(x) = \left(\frac{x^4}{4} - \frac{x^2}{2}\right)$ J. The total mechanical energy of a particle is 2 J. Then, the maximum speed (in m/s) is

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

23. A small body of m is attached to a light rod of length L , which can be rotated about its clamped upper end. Then minimum velocity that should be given to the body at lowest position, so that it completes vertical circle is

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

24. The velocities of two balls before and after collision are shown in figure



The coefficient of restitution between the balls is

- (1) Zero
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 (2) $\frac{4}{3}$
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 (3) $\frac{1}{3}$
 CC-156
 (4) $\frac{2}{3}$

25. Graph between elastic potential energy stored in spring v/s extension in the spring is

- (1) Parabola
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 (2) Ellipse
 CC-156
 (3) Hyperbola
 CC-156
 (4) Circle

26. A sphere A impinges directly on an identical sphere B at rest. If coefficient of restitution is e , the ratio of velocities of A and B after collision is

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

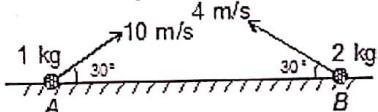
27. Consider following two statements.
 (a) In a collision, the colliding bodies may not come in real physical touch.
 (b) In a collision, mechanical energy is always conserved.
- The correct statement is

- (1) (a) only
 (2) (b) only
 (3) (a) and (b) both
 (4) Neither (a) nor (b)

28. A ball is dropped from height 10 m. If coefficient of restitution is 0.5, then height attained by the ball after first bounce is

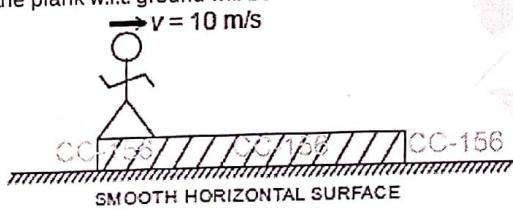
- (1) 5 m CC-156
 (2) 7.5 m
 (3) 10 m
 (4) 2.5 m

29. Two particles A and B of masses 1 kg and 2 kg are projected from same ground level as shown in figure. The maximum height reached by the centre of mass is



- (1) $\frac{3}{10}$ m
 (2) $\frac{3}{20}$ m
 (3) $\frac{9}{20}$ m
 (4) $\frac{9}{10}$ m

30. In the figure given below, a man of mass 4 kg is standing on a wooden plank of mass 40 kg which is kept at rest on a horizontal smooth ground. If man walks on the plank with a velocity of 10 m/s with respect to plank, then the velocity of the plank w.r.t. ground will be



- (1) $\frac{11}{10}$ m/s
 (2) $\frac{10}{11}$ m/s
 (3) 10 m/s
 (4) 1 m/s

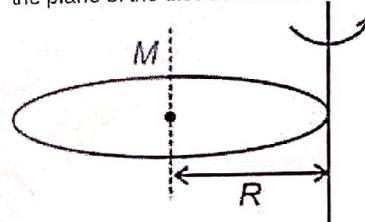
31. A bomb at rest explodes. The centre of mass of the system
 (1) Describes parabola
 (2) Moves vertically upward
 (3) Moves horizontally
 (4) Remains at rest

32. Match the Column I with Column II.

	Column I	Column II
(A)	Moment of inertia of rod (m, l) about its one end.	(P) $\frac{ml^2}{8}$
(B)	Moment of inertia of hollow sphere (mass- m , Dia- l) about its diameter	(Q) $\frac{2}{3}ml^2$
(C)	Moment of inertia of square plate (mass m , side length l) about axis passing through its centre and perpendicular to its plane	(R) $\frac{ml^2}{6}$
(D)	Moment of inertia of cylinder (mass- m , Dia- l) about its axis	(T) $\frac{ml^2}{3}$

- (1) A(P); B(Q); C(R); D(S)
 (2) A(S); B(Q); C(S); D(R)
 (3) A(S); B(R); C(Q); D(P)
 (4) A(S); B(R); C(R); D(P)

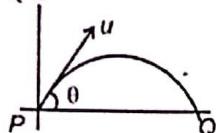
33. Moment of inertia of a uniform disc of mass M and radius R about an axis passing through its rim and perpendicular to the plane of the disc as shown is MK^2 , where K is



- (1) $\sqrt{\frac{3}{2}}R$
 (2) $\sqrt{\frac{5}{2}}R$
 (3) $\frac{\sqrt{3}R}{2}$ CC-156
 (4) $\frac{\sqrt{5}R}{2}$ CC-156

34. A force $\vec{F} = (2\hat{i} + 3\hat{j} + 4\hat{k}) \text{ N}$ is acting at point $(2\hat{i} + 2\hat{j} + 2\hat{k}) \text{ m}$. The magnitude of its torque about origin will be
 (1) $4\sqrt{6} \text{ N m}$
 (2) $2\sqrt{6} \text{ N m}$
 (3) $6\sqrt{2} \text{ N m}$
 (4) $3\sqrt{2} \text{ N m}$

35. The magnitude of average torque of weight about point of projection on a projectile of mass m , projected with initial speed u at an angle θ , with horizontal, between point P and Q is



- (1) $\frac{mu^2 \cos \theta}{2}$
- (2) $\frac{1}{2} mu^2 \sin 2\theta$
- (3) $\frac{1}{2} mu^2 \cos 2\theta$
- (4) $mu^2 \cos 2\theta$

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36. A wheel having moment of inertia 3 kg-m^2 about its vertical axis, rotates at the rate of 30 rpm about this axis. The torque which can stop the wheel's rotation in one minute would be

- (1) $\frac{\pi}{18} \text{ Nm}$
- (2) $\frac{2\pi}{20} \text{ Nm}$
- (3) $\frac{\pi}{15} \text{ Nm}$
- (4) $\frac{\pi}{20} \text{ Nm}$

37. Two masses m_1 and m_2 are attached to the ends of a light rod of length l . The moment of inertia of the system about an axis perpendicular to the rod and passing through the centre of mass is ($m_1 = m$ and $m_2 = 2m$)

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

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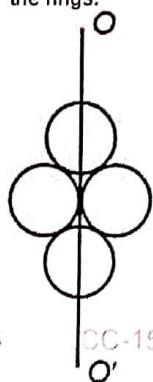
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38. Four identical rings each of mass ' m ' and diameter ' R ' are arranged in a plane as shown in figure. Find moment of inertia of system about O' which lies in same as plane as the rings.



- (1) $4mR^2$
- (2) $3mR^2$
- (3) $2mR^2$
- (4) mR^2

39. A disc starts rotating with constant angular acceleration of $\pi \text{ rad/s}^2$ about a fixed axis perpendicular to its plane and passing through its centre. The angular velocity of the disc at $t = 3 \text{ s}$ is

- (1) $2\pi \text{ rad/s}$
- (2) $3\pi \text{ rad/s}$
- (3) $4\pi \text{ rad/s}$
- (4) $5\pi \text{ rad/s}$

40. Consider the following statements **A** and **B**, identify the correct answer:

- A:** In a perfectly rigid body, the net positive work done by external torques increase the rotational kinetic energy of the body
B: Angular acceleration of a rotating body having fixed axis of rotation is inversely proportional to the moment of inertia of the body for a given torque.

- (1) A is correct but B is incorrect
- (2) A is incorrect but B is correct
- (3) Both A and B are correct
- (4) Both A and B are incorrect

41. The instantaneous power of a wheel is 500 W, when a 100 N.m torque is applied to it. The angular velocity of wheel at that instant will be

- (1) 5 rad/s
- (2) 2.5 rad/s
- (3) 10 rad/s
- (4) Zero

42. A rod of mass m and length l is hinged about its one of the ends. The rod is released from horizontal position, the angular speed of the rod when the rod becomes vertical is:

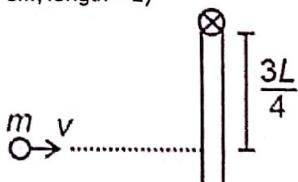
(1) $\omega = \sqrt{\frac{3g}{L}}$

(2) $\omega = \sqrt{\frac{5g}{L}}$

(3) $\omega = \sqrt{\frac{7g}{L}}$

(4) $\omega = 2\sqrt{\frac{2g}{L}}$

43. A ball of mass ' m ' strikes with speed v to a rod hinged at one end and placed on smooth horizontal surface as shown in figure. If ball stick to the rod after impact, then find the angular velocity of rod after impact. (Given mass of rod = $3m$, length = L)



(1) $\frac{6v}{5L}$

(2) $\frac{12v}{25L}$

(3) $\frac{v}{5L}$

(4) $\frac{3v}{25L}$

44. During somersault, a swimmer bends his body to

(1) Increase moment of inertia

(2) Decrease moment of inertia

(3) Increase angular momentum

(4) Decrease angular speed

45. A uniform disc of moment of inertia I and radius R is rotated with angular velocity ω . If two particles each of mass m sticks to its periphery gently then angular velocity of the disc will be

(1) ω

(2) $\frac{I\omega}{I+2mR^2}$

CC-156 (3) $\frac{I\omega}{I+mR^2}$ CC-156

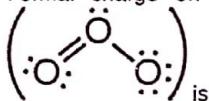
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(4) $\frac{I^2\omega}{(I+mr^2)^2}$

CHEMISTRY

46. Formal charge on middle oxygen of ozone molecule



(1) 0

(2) +1

(3) -1 CC-156

(4) -2

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47. Which of the following is an odd electron species?

(1) CH₄

(2) SF₆

(3) NO

(4) BF₃

48. Consider the following statements.

a. BeH₂ and BCl₃ have incomplete octet on central atoms.

b. N₂O is an odd electron molecule.

c. PF₅ and SF₆ have expanded octet on central atom.

The correct statements are

(1) a and b only

(2) b and c only

(3) a and c only

(4) a, b and c

49. Expanded octet is observed in which of the given compounds?

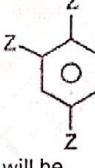
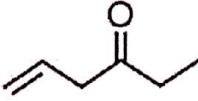
(1) NH₃

(2) BF₃

(3) CH₄

(4) SF₄

50. Which of the following compounds contain ionic, covalent as well as co-ordinate bond?
 (I) NH_4Cl
 (II) NaOH
 (III) NaBF_4
 (1) (I) only
 (2) (I) and (III) only
 (3) (II) and (III) only
 (4) (I), (II) and (III)
51. An atom of an element X has two electrons in its outermost orbit and that of Y has five electrons in its outermost orbit. The formula of the compound will be
 (1) X_2Y_3 CC-156
 (2) X_3Y_2
 (3) X_2Y_5
 (4) X_5Y_2
52. The number of covalent bonds present in CaC_2 is/are
 (1) 4
 (2) 3
 (3) 2
 (4) 1
53. Lowest lattice energy will be possessed by
 (1) NaF
 (2) MgF_2
 (3) AlF_3
 (4) LiF
54. The incorrect statement among the following with regards to resonance is
 (1) Resonance averages the bonds characteristics as a whole
 (2) The canonical forms have no real existence
 (3) There is an equilibrium between canonical forms
 Resonance stabilises the molecules as the energy of (4) resonance hybrid is less than energy of any canonical structures
55. $\text{NH}_3 + \text{BF}_3 \rightarrow [\text{H}_3\text{N} \rightarrow \text{BF}_3]$
 For above reaction which of the following is true?
 (1) Change in hybridisation of N takes place only
 (2) Change in hybridisation of B takes place only
 (3) Change in hybridisations of both B and N take place
 (4) No change in hybridisations of B or N
56. Which of the following pairs of species is isoelectronic and isostructural?
 (1) ClO_4^- and PO_4^{3-}
 (2) SO_4^{2-} and XeF_4
 (3) SO_3^{2-} and PCl_3
 (4) SO_3^{2-} and CO_3^{2-}
57. The most ionic halide among the following is
 (1) CCl_4
 (2) AlCl_3
 (3) MgCl_2 CC-156
 (4) NaCl CC-156 CC-156 CC-156
58. Given below are two statements one is labelled as Assertion (A) and the other is labelled as Reason (R).
 Assertion (A): NaNO_3 is an ionic compound.
 Reason (R): There is no covalent bond in NaNO_3 .
 In the light of above statements choose the most appropriate answer from options given below
 (1) Both Assertion & Reason are true and the reason is the correct explanation of the assertion
 (2) Both Assertion & Reason are true but the reason is not the correct explanation of the assertion
 (3) Assertion is true statement but Reason is false
 (4) Both Assertion and Reason are false statements
59. Calcium reacts with element (X) to form an ionic compound. If ground state electronic configuration of (X) is $1s^2 2s^2 2p^5$, then simplest formula of the compound will be
 (1) Ca_2X_3
 (2) CaX_2
 (3) CaX
 (4) Ca_2X
60. Which pair of species contains only π -bonds?
 (1) O_2 and N_2
 (2) B_2 and C_2 CC-156 56 CC-156
 (3) O_2 and B_2
 (4) N_2 and C_2

- 61.** Given below are two statements
Statement I : Bond enthalpy of N_2 molecule is higher than O_2 molecule.
Statement II : Bond enthalpy of HCl molecule is higher than H_2 molecule.
In the light of above statements, choose the correct answer from the options given below
(1) Both statement I and statement II are correct
(2) Both statement I and statement II are incorrect
(3) Statement I is correct but statement II is incorrect
(4) Statement I is incorrect but statement II is correct
- 62.** The correct order of decreasing bond length of C–C, C–H, C–O and O–H is
(1) C–C > C–O > O–H > C–H CC-156 CC-156 CC-156 CC-156 CC-156
(2) C–O > C–C > C–H > O–H
(3) C–C > C–O > C–H > O–H
(4) C–O > C–C > O–H > C–H
- 63.** Incorrect statement among the following is
(1) Be_2 molecule does not exist
(2) Boiling point of HF is higher than HCl
(3) BrF_5 is trigonal bipyramidal in shape
(4) Sulphur in $SOCl_2$ is sp^3 hybridised
- 64.** The bond order of N – O bond and P – O bond in NO_3^- and PO_4^{3-} ion respectively are
(1) 1.33 and 1.25
(2) 1.5 and 1.25
(3) 1.25 and 1.5
(4) 1.5 and 1.33
- 65.** Which among the following is most polar in nature?
(1) HI
(2) HBr
(3) HCl
(4) HF
- 66.** A diatomic molecule has net dipole moment 1.92 D and bond length 2.0 Å. The percentage ionic character of the molecule is ($1D = 3.33 \times 10^{-30} C\text{-m}$)
(1) 15%
(2) 20%
(3) 25%
(4) 30%
- 67.** Consider the following statements about Fajans rule
(a) The smaller is the size of cation and the larger the size of the anion, the greater the covalent character of an ionic bond.
(b) The greater the charge on the cation, the greater the covalent character of the ionic bond.
(c) For the cations of the same size and charge, the one, with electronic configuration $(n - 1)d^{10}ns^0$ is less polarising than the one with noble gas configuration, ns^2np^6
The correct statements are
(1) (a) and (c) only
(2) (b) and (c) only
(3) (a), (b) and (c)
(4) (a) and (b) only
- 68.** Which among the following has maximum bond angle?
(1) SO_2
(2) NF_3
(3) I_3^-
(4) BCl_3
- 69.** If dipole moment of  is $x D$, then the dipole moment of molecule  will be
(1) $3x D$
(2) $2x D$
(3) $x D$
(4) $\frac{x}{2} D$
- 70.** Total number of δ bonds in the following compound is

(1) 16
(2) 15
(3) 14
(4) 18

71. Match column-I with column-II

Column-I Molecule	Column-II Dipole moment (μ)
a. H_2O	(i) 0
b. NH_3	(ii) 1.85 D
c. BF_3	(iii) 0.23 D
d. NF_3	(iv) 1.47 D

Choose the correct option.

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

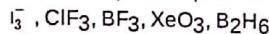
72. Match list-I with list-II.

List-I (Molecule)	List-II (Shape)
a. XeF_2	(i) Bent T-shape
b. ClF_3	(ii) See-saw
c. SF_4	(iii) Pyramidal
d. XeO_3	(iv) linear

The correct match is

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

73. Number of planar species among the following are



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

74. Match the list I with list II.

	List-I (Species)		List-II (Number of lone pairs around central atom)
a.	SO_2	(i)	0
b.	CHCl_3	(ii)	1
c.	IF_3	(iii)	2
d.	XeF_2	(iv)	3

Choose the correct match:

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

75. Match List-I with List-II.

List-I (Species)	List-II (Highest occupied molecular orbital)
a. B_2	(i) σ^*
b. Li_2	(ii) σ
c. F_2	(iii) π
d. He_2^+	(iv) π^*

Choose the correct answer from the options given below.

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

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76. Number of 90° bond angles in PCl_5 molecule is

- (1) 3
- (2) 6
- (3) 4
- (4) 2

77. According to VSEPR theory, the repulsive interaction of electron pairs decreases in the order of

- (1) Lone pair – Lone pair > Bond pair – Bond pair > Bond pair – Lone pair
- (2) Bond pair – Bond pair > Bond pair – Lone pair > Lone pair – Lone pair
- (3) Lone pair – Lone pair > Lone pair – Bond pair > Bond pair – Bond pair
- (4) Bond pair – Lone pair > Lone pair – Lone pair > Bond pair – Bond pair

78. Match List I with List II

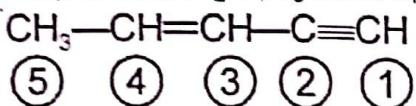
	List I (Compounds)		List II (Hybridisation)
(a)	BF_3	(i)	sp
(b)	H_2O	(ii)	sp^2
(c)	SF_6	(iii)	sp^3
(d)	BeCl_2	(iv)	sp^3d^2

Choose the correct match

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

79. The hybridisation of C₂, C₄, C₅ in the compound



respectively are

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

80. Given below are the two statements

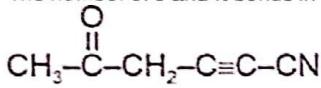
Statement I: PCl₅ contains two axial bonds and three equatorial bonds.

Statement II: In PCl₅, equatorial bonds are slightly longer than axial bonds.

In light of the above statements, choose the correct answer

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

81. The number of σ and π bonds in the given compound



are, respectively

- (1) 11 and 6
(2) 12 and 5
(3) 12 and 6
(4) 14 and 5

82. Which of the following statement is incorrect regarding hybridisation?

- (1) The number of hybrid orbitals are always less than the number of atomic orbitals that get hybridised
(2) The hybridised orbitals are always equivalent in energy and shape
(3) All sp^3 hybrid orbitals are at an angle of $109^\circ 28'$ to one another
(4) sp^3d^2 hybrid orbitals are directed towards the corners of a regular octahedron

83. Which of the following has $p\pi - d\pi$ bonding?

- (1) NO₂⁻
(2) NO₃⁻
(3) SO₃
(4) CO₃⁻²

84. During the conversion of O₂ to O₂⁺ ion, the electron is removed from which of the following molecular orbitals?

- (1) π^*
(2) π
(3) σ
(4) σ^*

85. Consider the following statements about O₂²⁻ ion

- (a) Highest occupied molecular orbital is π^* orbital
(b) Bond order is one
(c) Diamagnetic in nature

The correct statement(s) is/are

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

86. Considering z-axis as the internuclear axis which of the following combination will not result in bond formation?

- (1) p_z + p_z
(2) p_x + p_x
(3) p_x + p_y
(4) p_z + s

87. Choose the species with different magnetic behaviour and same number of electrons in antibonding molecular orbital.

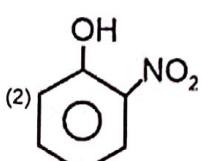
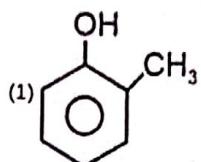
- (1) N₂⁻ and C₂⁻
(2) N₂ and O₂²⁺
(3) N₂⁺ and C₂²⁻
(4) O₂ and C₂⁻

88. Consider the following statements:

Statement I: Ethanol is soluble in water.
Statement II: Ethanol forms intramolecular hydrogen bond.
In the light of above statements, choose the correct answer from the options given below.

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

89. Intramolecular hydrogen bonding is observed in



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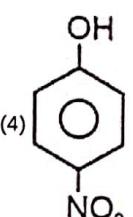
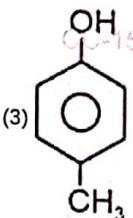
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90. Given below are two statements

Statement I: The magnitude of hydrogen bonding depends on the physical state of the compound.

Statement II: Hydrogen bonding is maximum in the gaseous state and minimum in the solid state.

In light of the above statements, choose the **correct** answer

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

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91. Instead of a cell wall, Euglenoids have a layer called pellicle, which makes their body flexible, is rich in

- (1) Chitin
- (2) Protein
- (3) Cellulose
- (4) Hemicellulose

92. Name the class of fungi which is commonly called imperfect fungi

- (1) Phycomycetes
- (2) Ascomycetes
- (3) Deuteromycetes
- (4) Basidiomycetes

93. The protists that are called chief producers in the ocean are

- (1) Dinoflagellates
- (2) Also responsible for the formation of diatomaceous earth
- (3) Without cell wall and are biflagellated
- (4) Responsible for red tide in sea

94. Which of the following features is common in all classes of fungi?

- (1) Morphology of mycelium
- (2) Mode of nutrition
- (3) Mode of spore formation
- (4) Type of fruiting body

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95. Which of the following organisms lack flagella?

- (1) Euglena
- (2) Paramecium
- (3) Trypanosoma
- (4) Gonyaulax

96. Cell walls form two thin overlapping shells, which fit together as in a soap box in

- (1) Slime moulds
- (2) Diatoms
- (3) Dinoflagellates
- (4) Euglenoids

97. Which of the following prokaryotic organisms can live in extremely salty areas?

- (1) Halophiles
- (2) Thermoacidophiles
- (3) Methanogens
- (4) Eubacteria

98. Read the following statements and select the correct option.

Statement A: In the five kingdom classification proposed by R.H. Whittaker there is no mention of the organisms that lack nucleus.

Statement B: W. M. Stanley called the fluid extract of the infected tobacco plants as *Contagium vivum fluidum*.

- (1) Both the statements are incorrect
- (2) Both the statements are correct
- (3) Only statement A is correct
- (4) Only statement B is correct

99. Aseptate and coenocytic mycelium is present in the members of

- (1) Ascomycetes
- (2) Phycomycetes
- (3) Deuteromycetes
- (4) Basidiomycetes

100. Which of the following pairs of diseases are caused due to the infectious agent consisting of abnormally folded protein?

- (1) Mad cow disease in cattle and potato spindle tuber disease.
- (2) Small pox and mumps.
- (3) Bovine spongiform encephalopathy and Creutzfeld-Jacob disease.
- (4) AIDS and mosaic disease of tobacco

101. Mode of nutrition in members of a kingdom which includes all prokaryotes can be

- (a) Photosynthetic
- (b) Chemosynthetic
- (c) Parasitic
- (d) Saprophytic

- (1) Only (a) & (b)
- (2) Only (b) & (c)
- (3) Only (c) & (d)
- (4) All (a), (b), (c) & (d)

102. Mark the odd one w.r.t. shapes in bacteria.

- (1) Bacillus – Rod shaped
- (2) Coccus – Helical
- (3) Vibrio – Comma shaped
- (4) Spirillum – Spiral

103. Which of the following statements is not correct w.r.t. the members of the group, imperfect fungi?

- (1) They reproduce by conidia
- (2) They help in mineral cycling
- (3) The mycelium is aseptate and coenocytic
- (4) They do not form meiospores

104. Which of the following is not an edible fungus?

- (1) Agaricus
- (2) Morels
- (3) Truffles
- (4) Puccinia

105. According to the five kingdom classification system by R.H. Whittaker in which pair of kingdom, both autotrophic as well as heterotrophic mode of nutrition is found?

- (1) Protista and fungi
- (2) Fungi and Monera
- (3) Animalia and Protista
- (4) Monera and Protista

106. Which of the following plants is an example of a parasitic plant?

- (1) Bladderwort
- (2) Venus fly trap
- (3) *Cuscuta*
- (4) Sugarcane

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107. *Ustilago* belongs to

- (1) Phycomycetes
- (2) Ascomycetes
- (3) Deuteromycetes
- (4) Basidiomycetes

108. Whittaker did not classify the organisms into five kingdoms on the basis of

- (1) Cell structure
- (2) Evolutionary relationships
- (3) Thallus organization
- (4) Response to external stimulus

109. Which one is not true for *Mycoplasma*?

- (1) Smallest living cell/organism
- (2) Facultative anaerobe
- (3) Parasitic to plants only
- (4) Resistant to antibiotic penicillin

110. Select the correct match w.r.t. five kingdom system of classification.

(1) Fungi	Nuclear membrane is absent
(2) Protista	Cell wall is present in some members
(3) Animalia	Loose tissue body organisation
(4) Monera	Cellulosic cell wall

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

111. Which of the following groups of protists are believed to be primitive relatives of animals?

- (1) Protozoans
- (2) Slime moulds
- (3) Red dinoflagellates
- (4) Chrysophytes

112. Mark the fungus commonly known as bread mould.

- (1) *Puccinia*
- (2) *Saccharomyces*
- (3) *Agaricus*
- (4) *Rhizopus*

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113. Specialised cells called heterocysts are present in

- (1) Slime moulds
- (2) Blue green algae
- (3) Protists
- (4) Golden algae

114. Infectious spore - like stage is present in the life cycle of:

- (1) *Amoeba*
- (2) *Trypanosoma*
- (3) *Paramecium*
- (4) *Plasmodium*

115. Bacterial viruses usually contain

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

116. Read the following statements and state them as True/False

- A. Some unicellular fungi are used to make beer.
- B. Cell wall of fungi is composed of chitin and a monosaccharide.
- C. Fungi prefer to grow in warm and humid places.
- D. Most fungi are heterotrophic and absorb insoluble organic matter.

A B C D

- (1) T T F T
- (2) T F T F
- (3) T T T F
- (4) T T F F

(1) (1)

(2) (2)

(3) (3)

(4) (4)

117. Sleeping sickness is caused by

- (1) *Paramoecium*
- (2) *Amoeba*
- (3) *Entamoeba*
- (4) *Trypanosoma*

118. Read the following statements and select the **correct** option.

Statement A: In addition to proteins, a virus also contains DNA along with RNA.

Statement B: Viruses can reproduce only within living cells and are obligatory intracellular parasites.

- (1) Only statement A is correct
- (2) Only statement B is correct
- (3) Both statements A and B are correct
- (4) Both statements A and B are incorrect

119. Select the odd one w.r.t. archaeabacteria

- (1) Methanogens
- (2) Halophiles
- (3) *Mycoplasma*
- (4) Thermoacidophiles

120. Primitive organisms that perform oxygenic photosynthesis are

- (1) Cyanobacteria
- (2) Sulphur bacteria
- (3) Archaeabacteria
- (4) Green algae

121. N₂ fixing cyanobacterium is

- (1) *Pseudomonas*
- (2) *Nostoc*
- (3) *Rhizobium*
- (4) *Chlorella*

122. Select the incorrect match.

- (1) *Albugo* – Forms oospore
- (2) *Claviceps* – Forms ascocarp
- (3) *Agaricus* – Has well developed sex organs
- (4) *Colletotrichum* – Lacks sexual stage

123. *Alternaria* differs from *Neurospora* as the former

- (1) Does not produce motile spores
- (2) Has septate mycelium
- (3) Reproduces asexually by conidia
- (4) Does not show karyogamy and plasmogamy

124. Members of phycomycetes are found

- (i) In aquatic habitats
- (ii) On decaying wood
- (iii) In moist and damp places
- (iv) As obligate parasites on plants

Choose the correct ones:

- (1) Only (i) and (ii)
- (2) Only (i) and (iv)
- (3) Only (ii) and (iii)
- (4) All (i), (ii), (iii) and (iv)

125. Chemosynthetic autotrophic bacteria

- (1) Are the most abundant kind of bacteria
- (2) Liberate oxygen in their surroundings
- (3) Reduce organic compounds to CO₂ and H₂O
- (4) Are important in recycling of mineral nutrients

126. Select the **correct** statement from the following.

- (1) Some protozoans are photosynthetic
- (2) All autotrophic protists have cell wall
- (3) Spores of slime moulds are dispersed by air currents
- (4) Dinoflagellates are mostly fresh water organisms

127. Smut and rust disease respectively are caused by

- (1) *Trichoderma* and *Puccinia*
- (2) *Colletotrichum* and *Ustilago*
- (3) *Ustilago* and *Puccinia*
- (4) *Agaricus* and *Albugo*

128. In *Agaricus*, karyogamy and meiosis take place in

- (1) Ascus
- (2) Basidium
- (3) Zygospore
- (4) Basidiospore

129. All viruses have

- (1) Primitive nucleus
- (2) DNA enclosed in capsid
- (3) Genetic material
- (4) Envelope

130. Aristotle classified the animals on the basis of

- (1) Natural affinities among them
- (2) Phylogenetic relationships
- (3) Absence or presence of red blood
- (4) Morphological characters

131. Read the following statements and select the correct option.

Statement-A: In a symbiotic association between algae and fungi, algae prepare food for fungi and fungi provide shelter and absorb mineral nutrients and water for its partner.

Statement-B: Lichens are very good pollution indicators.

- (1) Only statement A is correct
- (2) Only statement B is correct
- (3) Both the statements A and B are correct
- (4) Both the statements A and B are incorrect

132. Read the following statements and choose the correct option.

A. *Gonyaulax* is a red dinoflagellate.
B. In *Claviceps*, plasmogamy is immediately followed by karyogamy.
C. *Alternaria* asexually reproduces through conidia.

- (1) Only A
- (2) A and B only
- (3) A and C only
- (4) Only B

133. Zygospores are formed in some terrestrial fungi. These spores are

- (1) Without cell wall
- (2) Motile
- (3) Diploid
- (4) Formed inside the zoosporangium

134. The protist that forms an aggregation called plasmodium

- (1) Has cellulosic cell wall
- (2) Forms fruiting bodies during unfavourable conditions
- (3) Has ssRNA as genetic material
- (4) Is autotrophic organism

135. *Chrysophytes*, *euglenoids*, *dinoflagellates* and *slime moulds*

- (1) Are photosynthetic and marine
- (2) Reproduce asexually by a process involving zygote formation
- (3) Are flagellated multicellular protists
- (4) Contain nucleus and membrane-bound organelles inside the cell

ZOOLOGY

136. The amount of oxygen delivered to tissue by one litre of blood under strenuous condition is approximately

- (1) 5 ml
- (2) 50 ml
- (3) 15 ml
- (4) 150 ml

137. Asthma is characterised by

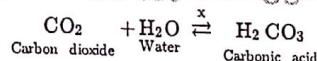
- (1) Inflammation of bronchi and bronchioles
- (2) Damaged alveolar walls and chronic accumulation of fluid in the lungs
- (3) Proliferation of fibrous tissues in lungs
- (4) Bacterial infection resulting in inflammation in trachea

138. In humans, what is the partial pressure of oxygen and carbon dioxide respectively in the systemic artery?

	Oxygen	Carbon dioxide
(1)	40 mm Hg	45 mm Hg
(2)	95 mm Hg	40 mm Hg
(3)	104 mm Hg	40 mm Hg
(4)	45 mm Hg	95 mm Hg

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

139. Consider the given reaction occurring in our body:



Select the correct option w.r.t enzyme 'X'.

- (1) RBCs contain a very high concentration of the enzyme 'X'.
- (2) Minute quantities of the enzyme 'X' is present in the granulocytes
- (3) Mg^+ is the co-enzyme for 'X'
- (4) Belongs to class II of enzymes

140. The respiratory disorder emphysema is attributed to

- (1) Lung fibrosis
- (2) Increased activity of mast cells in the muscular surface of lungs
- (3) Reduced respiratory surface area
- (4) Inflammation of only bronchioles

141. Consider the statements given below

Statement A: All the reptiles have a 3-chambered heart with two atria and a single ventricle.

Statement B: In humans, the opening between the right atrium and the right ventricle is guarded by valve made up of three muscular cusps whereas the opening between the left atrium and the left ventricle is guarded by valve made up of two muscular cusps.

Choose the correct option.

- (1) Both the statements A and B are correct
- (2) Both the statements A and B are incorrect
- (3) Only statement A is incorrect
- (4) Only statement B is incorrect

142. In humans, under normal physiological conditions, about what percentage of total CO_2 is carried by blood plasma?

- (1) 7%
- (2) 77%
- (3) 20-25%
- (4) 70%

143. Read the following statements w.r.t. respiratory system in humans.

- (A) At the tissue site, carbonic acid dissociates into H_2O and CO_2 in presence of enzyme carbonic anhydrase.
- (B) Diffusion membrane is made up of three major cellular layers.

Choose the correct option.

- (1) Both statements A and B are correct
- (2) Only statement A is correct
- (3) Only statement B is correct
- (4) Both statements A and B are incorrect

144. Increase in the concentration of H^+ in blood will lead to

- (1) Reduced rate of dissociation of oxyhaemoglobin
- (2) Reduced supply of O_2 to tissues
- (3) Decrease in the affinity of haemoglobin with oxygen
- (4) Shifting of oxygen dissociation curve to the left side

145. Central chemoreceptors associated with medulla oblongata respond to changes in A or B or both in the cerebrospinal fluid.

Select the option that fills the blanks correctly.

A	B
(1) CO_2 concentration; O_2 concentration	
(2) H^+ concentration; OH^- concentration	
(3) pCO_2 ; H^+ concentration	
(4) pCO_2 ; HCO_3^- concentration	

(1) (1)

(2) (2)

(3) (3) CC-156

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CC-156

(4) (4)

146. Assertion (A): Neural signals from pneumotaxic centre can reduce the duration of inspiration.

Reason (R): Pneumotaxic centre present in the medulla region of brain can moderate the functions of the respiratory rhythm centre.

In the light of above statements, select the most appropriate option.

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

147. One of the most common and obvious disorder that occurs in the people who are involved in grinding or stone-breaking industries for a long period of time is

- (1) Cystic fibrosis
- (2) Emphysema
- (3) Pneumonia
- (4) Lung fibrosis

148. The pO_2 in systemic veins and pCO_2 in aorta carrying oxygenated blood is _____ and _____ respectively.

Choose the correct option to fill in the blanks.

- (1) 40 mm Hg; 95 mm Hg
- (2) 95 mm Hg; 45 mm Hg
- (3) 40 mm Hg; 40 mm Hg
- (4) 40 mm Hg; 45 mm Hg

149. In humans, the major part of carbon dioxide is transported

- (1) As bicarbonate
- (2) As carboxyhaemoglobin
- (3) As carbaminohaemoglobin
- (4) In a dissolved state through blood plasma

- 150.** The solubility of CO_2 is 'A' times higher than that of O_2 . 'A' is numerically equal to the
(1) Percentage of lymphocytes amongst total WBCs
(2) Normal respiratory rate of a healthy adult man
(3) Percentage of least abundant cells amongst all WBCs
(4) Number of blood groups in humans based on ABO blood grouping

151. Simple spirometer can be used to measure

- (1) Volume of air that will remain in the lungs after a normal expiration
(2) The maximum volume of air a person can breathe in after a forced expiration
(3) Total volume of air accommodated in the lungs at the end of a forced inspiration.
(4) Volume of air remaining in the lungs even after a forcible expiration

152. Each adult human haemoglobin molecule contains _____ chains which can carry a maximum of _____ molecules of O_2 .

Fill in the blanks respectively with the **correct** option.
(1) 2α and 1γ , two
(2) 2α and 2β , four
(3) 2α and 1β , two
(4) 1α and 2β , four



153. In case of people who live at higher altitudes, body gets acclimatised and compensates low oxygen availability by
(1) Decreasing breathing rate
(2) Increasing the size of red blood cells
(3) Increasing the production of red blood cells
(4) Eating less nutritive food

154. Total volume of air accommodated in the lungs at the end of a forced inspiration can be represented by all of the following, except

- (1) $\text{VC} + \text{RV}$
(2) $\text{EC} + \text{IC} - \text{RV}$
(3) $\text{RV} + \text{IRV} + \text{EC}$
(4) $\text{FRC} + \text{IC}$

155. Maximum volume of air one can breathe in after a forceful expiration is

- (1) Functional residual capacity
(2) Inspiratory reserve volume
(3) Total lung capacity
(4) Vital capacity

156. Tidal volume is included in all of the following respiratory capacities, except

- (1) TLC
(2) VC
(3) IC
(4) FRC

157. Select the **incorrect** match.

- (1) Vital capacity – 3000-3500 mL
(2) Respiratory minute volume – 6000-8000 mL
(3) Total lung capacity – 5100-5800 mL
(4) Expiratory reserve volume – 1000-1100 mL

158. P, Q, R, S and T waves of a standard ECG represent various electrical activities of a normal human heart during a cardiac cycle. The joint diastole can be represented most likely between which of the following waves of ECG?

- (1) P-wave and Q-wave of an ECG during a cardiac cycle
(2) Q-wave and R-wave of an ECG during a cardiac cycle
(3) Q-wave and T-wave of an ECG during a cardiac cycle
(4) T-wave and P-wave of ECG of two adjacent cardiac cycles

159. Under normal physiological condition, during the formation of oxyhaemoglobin, about 90% saturation of Hb with O_2 occurs when the pO_2 is about

- (1) 40 mm Hg
(2) 60 mm Hg
(3) 55 mm Hg
(4) 45 mm Hg

160. The maximum number of action potentials generated by SAN in human heart under normal physiological conditions, is

- (1) 70-75/second
(2) 70-75/minute
(3) 60-65/minute
(4) 60-65/second

161. Read the following statements w.r.t. human heart
(i) Endodermally derived organ situated in the thoracic cavity.
(ii) In an adult, it is of the size of a clenched fist.
(iii) It is protected by a double walled membranous bag called the pericardium.
(iv) The small upper chambers of the heart are called atria and lower large chambers are called ventricles.
How many statements is/are correct?

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

162. Oxygenated blood from left ventricle enters the aorta by opening of

- (1) Semilunar valve
- (2) Mitral valve
- (3) Bicuspid valve
- (4) Tricuspid valve

163. Which of the following cells is capable of engulfing foreign particles?

- (1) Monocytes
- (2) Basophils
- (3) Lymphocytes
- (4) Thrombocytes

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164. Read the following statements.

Statement A: A closed circulatory system is more advantageous than an open circulatory system.

Statement B: Fluid can be more precisely regulated in a closed circulatory system as compared to an open circulatory system.

Select the correct option.

- (1) Both statements A and B are correct
- (2) Both statements A and B are incorrect
- (3) Only statement A is correct
- (4) Only statement B is correct

165. A special system of blood vessels in our body that is exclusively meant for the circulation of blood to and from the cardiac musculature is

- (1) Pulmonary circulation
- (2) Coronary circulation
- (3) Renal portal system
- (4) Hepatic portal system

166. Which enzyme is responsible for the conversion of inactive fibrinogens to fibrins?

- (1) Thrombokinase
- (2) Thrombin
- (3) Renin
- (4) Erythropoietin

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167. Read the following statements carefully.

- (a) Blood is considered as a fluid connective tissue and it does not have fibres.
- (b) A healthy individual has 400-600 gms of haemoglobin in every 500 mL of blood.
- (c) Spleen is the reservoir and graveyard of erythrocytes.

Choose the correct option.

- (1) (a) and (c) are correct
- (2) (b) and (c) are incorrect
- (3) (a) and (b) are correct
- (4) (b) and (c) are correct

168. How many double circulations are completed in a healthy human in one minute under resting conditions?

- (1) 36
- (2) 72
- (3) 144
- (4) 18

169. Assertion (A): In humans, the mature RBCs are enucleated and biconcave disc shaped.

Reason (R): Absence of nucleus provides more space for oxygen binding pigment haemoglobin and biconcave shape increases the total surface area for exchange of gases.

In the light of above statements, choose the correct option.

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

170. Match column I with column II.

Column I Column II

- | | |
|----------------|---|
| (a) Fishes | (i) Both pulmonary and systemic circulation are present |
| (b) Amphibians | (ii) Most of them contain 3-chambered heart |
| (c) Reptiles | (iii) Both oxygenated and deoxygenated blood get mixed up in a single ventricle |
| (d) Birds | (iv) Heart pumps out deoxygenated blood |

Choose the correct option.

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

171. Which of the following blood cells secrete histamine, serotonin, heparin and are chiefly involved in inflammatory reactions?

- (1) Eosinophils
- (2) Basophils
- (3) Neutrophils
- (4) Monocytes

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172. In humans, the second heart sound named 'dub' is produced due to

- (1) Closure of AV valves
- (2) Opening of AV valves
- (3) Closure of semilunar valves
- (4) Opening of semilunar valves

173. All of the following can increase the cardiac output in humans, except

- (1) Sympathetic neural signals
- (2) Adrenaline from adrenal medulla
- (3) Parasympathetic neural signals
- (4) Norepinephrine from adrenal medulla

174. In a hypothetical condition, if only AV node is removed from the human heart in such a way that the action potentials generated in SA node are still conducted to the ventricles by AV bundle and Purkinje fibres. Then, what could be the possible effects in such case?

- (1) Atria will stop contracting
- (2) Stroke volume will increase
- (3) Both atria and ventricles will stop contracting
- (4) Both atria and ventricles will contract nearly at the same time

175. In order for blood to flow from right atrium to left atrium in mammalian heart, it must flow through

- (1) Right ventricle → Pulmonary vein → Lungs → Pulmonary artery
- (2) Right ventricle → Pulmonary artery → Lungs → Pulmonary vein
- (3) Right ventricle → Pulmonary trunk → Lungs → Aorta
- (4) Right ventricle → Aorta → Lungs → Pulmonary trunk

176. A special neural centre in the A can moderate the cardiac function through autonomic nervous system. Choose the option that correctly fills the blank.

- (1) Medulla oblongata
- (2) Pons
- (3) Cerebrum
- (4) Cerebellum

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177. Choose the incorrect match.

(1)	Cardiac arrest	-	Heart stops beating
(2)	Angina pectoris	-	Chest pain due to myocardial ischemia
(3)	Atherosclerosis	-	Narrowing of coronary artery
(4)	Heart failure	-	Heart muscle is suddenly damaged by inadequate blood supply

(1) (1)

(2) (2)

(3) (3)

CC-156 (4) (4) CC-156 CC-156 CC-156 CC-156

178. Artificial pacemaker is required during treatment of

- (1) CAD
- (2) Myocardial infarction
- (3) Cardiac arrhythmia
- (4) Angina pectoris

179. Complete the analogy by selecting the correct option.
Blood: Fluid connective tissue :: Lymph : _____

- (1) Loose connective tissue
- (2) Dense regular connective tissue
- (3) Dense irregular connective tissue
- (4) Fluid connective tissue

180. Read the following statement w.r.t erythroblastosis foetalis. To prevent erythroblastosis foetalis, the Rh-ve mother is administered A antibodies, immediately after the delivery of B Rh+ve child.

Choose the option that correctly fills the blanks A and B.

A	B
(1) Anti-A and Anti-B	Last
(2) Anti-A	First
(3) Anti-Rh	First
(4) Anti-B	Second

(1) (1) CC-156

(2) (2)

(3) (3)

(4) (4)