



ME - SAT
Mentors Eduserv Scholarship Aptitude Test

**CLASS - 12 PASS STUDENTS
(MEDICAL STREAM)**

**SAMPLE
TEST PAPER**

CORPORATE OFFICE :- PATNA, BIHAR (PARUSLOK COMPLEX, BORING ROAD CROSSING, PATNA-01)

CENTRES (AT PATNA) :-  BORING ROAD  KANKARBACH  BAZAR SAMITI

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SCHOLARSHIP TEST

SAMPLE TEST PAPER

[For Class 12 Pass Students]
[STREAM: MEDICAL]

Time : 2 hours

Maximum Marks: 240

INSTRUCTIONS

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

(A) **General :**

1. This Question paper contains **THREE** parts (Physics, Chemistry and Biology).
2. This Question Paper contains 27 pages, other than the OMR.
3. This question paper contains total 120 questions (**30 questions** each in Physics & Chemistry and **60 question** in Biology).
4. The Question Paper has blank spaces at the bottom of each page for rough work.No additional sheets will be provided for rough work.
5. Blank papers, clip boards, log tables, slide rule, calculators, cellular phones, pagers and electronic gadgets, in any form, are **NOT** allowed.
6. This booklet also contains the **OMR** answer sheet (i.e., A machine gradable Response Sheet).

(B) **Answering on the OMR:**

7. Each question will have **4 choices** in both the Sections, out of which **only one choice is correct**.
8. Fill the bubble with **Ball Pen (Blue or Black) ONLY**.

(C) **Filling – Name and Registration No.**

9. On the **OMR sheet**, write your Name and Registration No. using ball pen. Also, put your signature in the appropriate box using ball pen.

(D) **Marking Scheme:**

9. (a) For each question, you will be awarded **4 marks** if you have darkened only one bubble corresponding to the right answer.
(b) In case you have not darkened any bubble, you will be awarded 0 mark for that question.
(c) In all other cases, you will be awarded **-1 mark**.

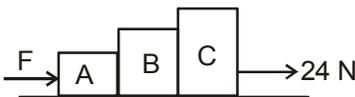
Name :

Registration No.:

SEAL

PART-A : PHYSICS

1. A particle starts moving on a straight line with zero initial velocity and acceleration:
 $a = +2 \text{ m/s}^2$ for $0 < t < 2\text{s}$
 $a = -2 \text{ m/s}^2$ for $t > 2\text{s}$.
 The time at which the particle will pass through its original position, is:
- (A) $4 + 2\sqrt{2}\text{s}$ (B) $2 + 2\sqrt{2}\text{s}$ (C) $2\sqrt{2}\text{s}$ (D) 4s
2. A particle starts moving on a circle with initial angular velocity zero, and some constant angular acceleration. The particle passes through its original position for the first time with angular velocity ω . The angular velocity of the particle, at the moment it passes through its original position the second time, is:
- (A) $\sqrt{2}\omega$ (B) 2ω (C) $2\sqrt{2}\omega$ (D) 4ω
3. Three blocks A, B and C of mass 1kg, 2kg and 6kg respectively are placed in contact with each other, on a horizontal smooth surface, as shown in the figure. A force 24 N is applied horizontally on the block C, toward right. A force F is applied horizontally on the block A, toward right. If the normal contact force between the block B and C is zero, the value of F will be:



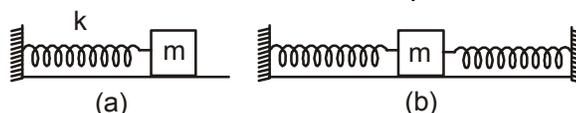
- (A) 4 N (B) 6 N (C) 10 N (D) 12 N
4. A perfectly flexible chain of mass M and length L is placed on a horizontal table. A boy holds one end of the chain and very slowly lifts this end vertically upward. The total work done by the boy in lifting the chain, by the time the other end of the chain just leaves contact with the table, is:
- (A) $Mg\frac{\ell}{2}$ (B) $Mg\ell$ (C) $\frac{2Mg\ell}{3}$ (D) $2Mg\ell$

Space for rough work

5. A ball is released on a horizontal floor, from a height of 320 m. Coefficient of restitution for the collision of the ball with the floor is $1/2$. The time interval between the second and the third collision of the ball with the floor is:
 (A) 2 s (B) 4 s (C) 6 s (D) 8 s
6. A spherical solid ball of bulk modulus B is taken from the surface of ocean to a depth of h . The density of the liquid is σ (constant). Acceleration due to gravity is g . The fractional change in the radius of the ball is:

(A) $\frac{\sigma gh}{B}$ (B) $\frac{\sigma gh}{2B}$ (C) $\frac{\sigma gh}{3B}$ (D) $\frac{\sigma gh}{4B}$

7. A block is connected with a spring and placed on a smooth horizontal floor as shown in the figure (a). If displaced and released, the block oscillates with a time period T . Now the spring is cut into two equal parts and the two parts are connected with the same block as shown in the figure (b). Now the block will oscillate with time period:

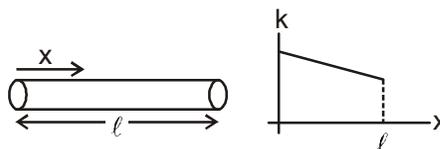


(A) $\frac{T}{\sqrt{2}}$ (B) $\frac{T}{2}$ (C) T (D) $2T$

8. The velocity of the wave $y = A \sin^2(ax + bt)$ is :

(A) $\frac{a}{b}$ (B) $\frac{b}{a}$ (C) $\frac{2a}{b}$ (D) $\frac{2b}{a}$

9. The coefficient of thermal conductivity of a rod changes with x (distance from left end) as shown in the graph. The left end of the rod is maintained at 100°C . In the steady state, the temperature of the midpoint of the rod is 50°C . The temperature ($t^\circ\text{C}$) of the right end of the rod will be:



(A) $t > 0^\circ\text{C}$ (B) $t < 0^\circ\text{C}$ (C) $t = 0^\circ\text{C}$ (D) data insufficient.

Space for rough work

10. Three particles A, B and C are placed on the vertices of an equilateral triangle. Mass of all particles is same. Charges on the particles A, B and C are $+q$, $-q$ and $+q$. The three particles are released simultaneously. Just after the releasing, ratio of the accelerations of the particle A and B (a_A / a_B) will be:

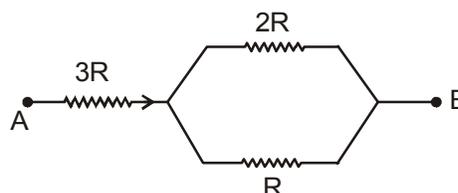
(A) 1 (B) 2 (C) $\sqrt{3}$ (D) $\frac{1}{\sqrt{3}}$

11. Two particles having same charge $+Q$ are fixed at $(0, b)$ and $(2a, b)$. A third particle of mass m and charge $-q$ is released at $(a, b + c)$. Assuming, $c \ll a$, time period of the oscillations of the third particle will be:

(A) $2\pi\sqrt{\frac{2\pi\epsilon_0 ma^3}{Qq}}$ (B) $\pi\sqrt{\frac{\pi\epsilon_0 ma^3}{Qq}}$ (C) $\pi\sqrt{\frac{2\pi\epsilon_0 ma^3}{Qq}}$ (D) $2\pi\sqrt{\frac{\pi\epsilon_0 ma^3}{Qq}}$

12. Three resistances R , $2R$ and $3R$ are connected between A and B as shown in the figure. A current flows in the combination from A to B. The heat generated per second in resistance R is H . The total heat generated in the entire combination, per second, is:

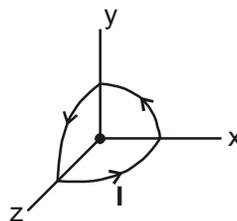
(A) $\frac{22}{3}H$ (B) $6H$



(C) $\frac{33}{4}H$ (D) $\frac{11}{6}H$

13. A loop consists of three circular parts lying in the xy , yz and zx planes, such that their centres are common at origin. Radius of these three circular parts is R . A current I flows in the loop. Magnetic field at the origin will be:

(A) $\frac{\sqrt{3}\mu I}{2R}$ (B) $\frac{\sqrt{3}\mu I}{4R}$



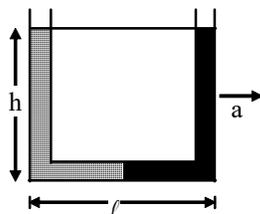
(C) $\frac{\sqrt{3}\mu I}{8R}$ (D) $\frac{\sqrt{3}\mu I}{16R}$

Space for rough work

14. A charged particle having charge $+q$ and mass m is projected from origin with velocity $\mathbf{v} = v_0 \hat{i}$ in the uniform magnetic field $\vec{B} = B_0 \hat{i} + B_0 \hat{j}$. The particle will touch the xy plane for the first time, at:
- (A) $\left(\frac{\pi m v_0}{\sqrt{2} q B_0}, \frac{\pi m v_0}{\sqrt{2} q B_0} \right)$ (B) $\left(\frac{\pi m v_0}{\sqrt{2} q B_0}, \frac{\pi m v_0}{2 q B_0} \right)$
- (C) $\left(\frac{\pi m v_0}{2 q B_0}, \frac{\pi m v_0}{2 q B_0} \right)$ (D) $\left(\frac{\pi m v_0}{q B_0}, \frac{\pi m v_0}{q B_0} \right)$
15. A projectile thrown with initial velocity $(a\hat{i} + b\hat{j})$ and its range is twice the maximum height attained by it then –
- (A) $b = a/2$ (B) $b = a$ (C) $b = 2a$ (D) $b = 4a$
16. The equations of motion of a projectile thrown in x - y plane from origin are $x = 8t$, $y = 6t - 10t^2$ then the angle of projectile is –
- (A) $\tan^{-1}(3/4)$ (B) $\tan^{-1}(4/3)$ (C) $\sin^{-1}(3/4)$ (D) $\cos^{-1}(3/4)$
17. The moment of inertia of a body about a given axis is $1.2 \text{ kg} \times \text{m}^2$. Initially, the body is at rest. In order to produce a rotational KE of 1500 joule, an angular acceleration of 25 rad/sec^2 must be applied about that axis for a duration of –
- (A) 4 s (B) 2 s (C) 8 s (D) 10 s
18. The gravitational field due to a mass distribution is $E = \frac{A}{x^2}$ in x -direction. Here, A is a constant. Taking the gravitational potential to be zero at infinity, potential at x is –
- (A) $\frac{2A}{x}$ (B) $\frac{2A}{x^3}$ (C) $\frac{A}{x}$ (D) $\frac{A}{2x^2}$

Space for rough work

19. A U-tube of base length " ℓ " filled with same volume of two liquids of densities r and $2r$ is moving with an acceleration " a " on the horizontal plane. If the height difference between the two surfaces (open to atmosphere) becomes zero, then the height h is given by

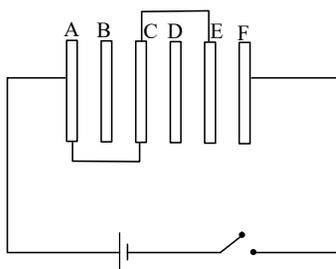


- (A) $\frac{a}{2g} \ell$ (B) $\frac{3a}{2g} \ell$ (C) $\frac{a}{g} \ell$ (D) $\frac{2a}{3g} \ell$
20. A uniform metal rod is used as a bar pendulum. If the room temperature rises by 10°C , and the coefficient of linear expansion of the metal of the rod is 2×10^{-6} per $^\circ\text{C}$, the period of the pendulum will have percentage increase of –
- (A) -2×10^{-3} (B) -1×10^{-3} (C) 2×10^{-3} (D) 1×10^{-3}
21. The equation of process of a diatomic gas is $P^2 = \alpha^2 V$, where α is a constant. Then choose the correct option-

- (A) Work done by gas for a temperature change T is $\frac{2}{3} \alpha nRT$
- (B) The change in internal energy is $\frac{5}{2} nRT$ for a temperature change T
- (C) Specific heat for the process is $\frac{19}{9} R$
- (D) The change in internal energy for a temperature change T is $\frac{5}{2} \alpha nRT$

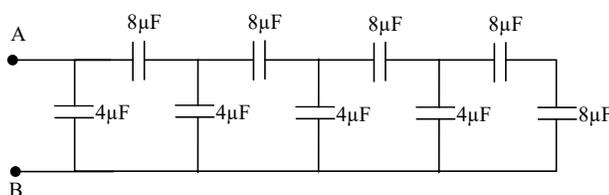
Space for rough work

22. A,B,C,D,E,F are conducting plates each of area A and any two consecutive plates separated by a distance d. The net energy stored in the system after the switch S is closed is :



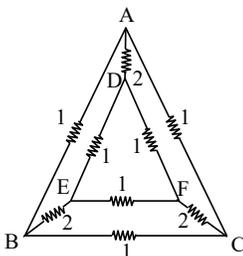
- (A) $\frac{3\epsilon_0 A}{2d} V^2$ (B) $\frac{5\epsilon_0 A}{12d} V^2$ (C) $\frac{\epsilon_0 A}{2d} V^2$ (D) $\frac{\epsilon_0 A}{d} V^2$

23. Find the equivalent capacitance between A and B.



- (A) $2 \mu F$ (B) $6 \mu F$ (C) $8 \mu F$ (D) $12 \mu F$

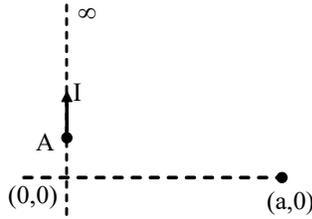
24. A network of nine conductors connects six points A, B, C, D, E and F as shown below. The digits denote resistances in Ω . Find the equivalent resistance between A and D -



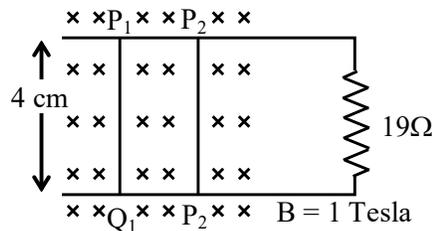
- (A) 2Ω (B) 3Ω (C) 1Ω (D) 5Ω

Space for rough work

25. An infinitely long wire carrying current I is along y-axis such that its one end is at point $A(0, b)$ while the wire extends upto $+\infty$. The magnitude of magnetic field strength at point $(a, 0)$.



- (A) $\frac{\mu_0 I}{4\pi a} \left(1 + \frac{b}{\sqrt{a^2 + b^2}} \right)$ (B) $\frac{\mu_0 I}{4\pi a} \left(1 - \frac{b}{\sqrt{a^2 + b^2}} \right)$
- (C) $\frac{\mu_0 I}{4\pi a} \left(\frac{b}{\sqrt{a^2 + b^2}} \right)$ (D) None of these
26. In figure, wires P₁Q₁ and P₂Q₂, both are moving towards right with speed 5 cm/sec. Resistance of each wire is 2Ω . Then current through 19Ω resistor is –



- (A) 0 (B) 0.1 mA (C) 0.2 mA (D) 0.3 mA
27. A 750 Hz, 20 volt source is connected to a resistance of 100 ohm, an inductance of 0.1803 henry and a capacitance of $10\mu\text{F}$, all in series. The time in which the resistance (thermal capacity = 2 joule/ $^{\circ}\text{C}$) will get heated by 10°C is –
- (A) 348 sec (B) 328 sec (C) 248 sec (D) 228 sec

Space for rough work

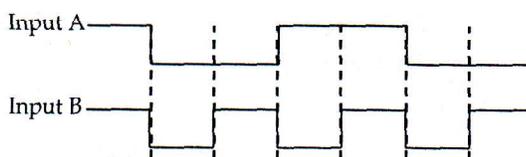
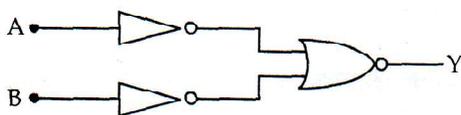
28. A ray of light passes from vacuum into a medium of refractive index μ , the angle of incidence is found to be twice the angle of refraction. Then the angle of incidence is

- (A) $\cos^{-1} \left(\frac{\mu}{2} \right)$ (B) $2 \cos^{-1} \left(\frac{\mu}{2} \right)$ (C) $2 \sin^{-1} \mu$ (D) $2 \sin^{-1} \left(\frac{\mu}{2} \right)$

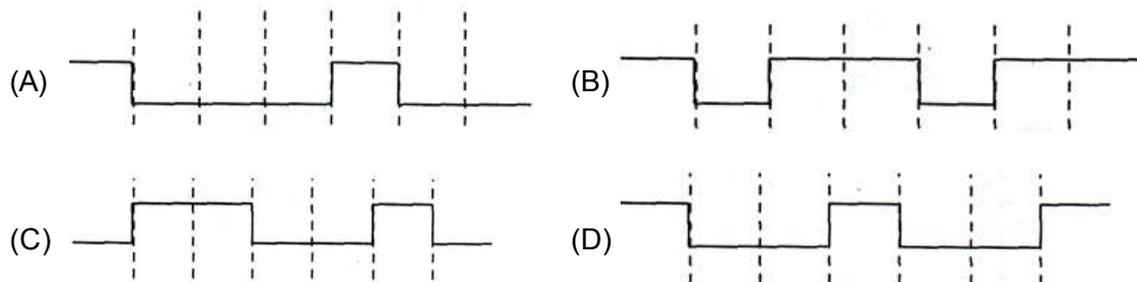
29. The radiation emitted, when an electron jumps from $n = 3$ to $n = 2$ orbit is a hydrogen atom, falls on a metal to produce photoelectron. The electrons from the metal surface with maximum kinetic energy are made to move perpendicular to a magnetic field of $\frac{1}{320}$ T in a radius of 10^{-3} m. Find the work function of metal-

- (A) 1.03 eV (B) 1.89 eV (C) 0.86 eV (D) 2.03 eV

30. The logic circuit shown below has the input waveforms 'A' and 'B' as shown. Pick out the correct output waveform.



Output is :



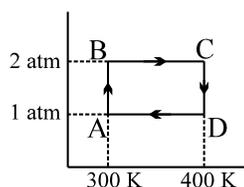
Space for rough work

PART-B : CHEMISTRY

31. Freezing point of an aqueous solution is $(-0.186)^{\circ}\text{C}$. Elevation of boiling point of the same solution is $K_b = 0.512^{\circ}\text{C}$, $K_f = 1.86^{\circ}\text{C}$, find the increase in boiling point.
 (A) 0.186°C (B) 0.0512°C (C) 0.092°C (D) 0.2372°C
32. The value of $(n_2 + n_1)$ and $(n_2^2 - n_1^2)$ for He^+ ion in atomic spectrum are 4 and 8 respectively. The wavelength of emitted photon when electron jump from n_2 to n_1 is
 (A) $\frac{32}{9} R_H$ (B) $\frac{9}{32} R_H$ (C) $\frac{9}{32 R_H}$ (D) $\frac{32}{9 R_H}$
33. For a certain gas which deviates a little from ideal behaviour. A plot between P/ρ vs P was found to be non-linear, the intercept on y-axis will be :
 (A) $\frac{RT}{M}$ (B) $\frac{M}{RT}$ (C) $\frac{MZ}{RT}$ (D) $\frac{R}{TM}$
34. The dissociation constant for $[\text{Ag}(\text{NH}_3)_2]^+$ into Ag^+ and NH_3 is 10^{-13} at 298 K. If $E_{\text{Ag}^+/\text{Ag}}^{\circ} = 0.8\text{V}$, then E° for the half cell $[\text{Ag}(\text{NH}_3)_2]^+ + e^- \longrightarrow \text{Ag} + 2\text{NH}_3$ will be
 (A) 0.33V (B) -0.33V (C) -0.033V (D) 0.033V
35. A solution contains 0.09M HCl , $0.09\text{M CCl}_2\text{HCOOH}$, and $0.1\text{M CH}_3\text{COOH}$. If total $[\text{H}^+] = 0.1\text{M}$ and K_a for $\text{CH}_3\text{COOH} = 10^{-5}$, K_a for CCl_2HCOOH is -
 (A) 1.35×10^{-4} (B) 0.18×10^{-2}
 (C) 0.18×10^{-5} (D) 1.25×10^{-2}
36. In a first order reaction, the concentration of the reactant, decreases from 0.8M to 0.4M is 15 minutes. The time taken for the concentration to change 0.1M to 0.025M is
 (A) 7.5 minutes (B) 15 minutes (C) 30 minutes (D) 60 minutes

Space for rough work

37. Two moles of Helium gas undergo a reversible cyclic process as shown in figure. Assuming gas to be ideal, what is the net work involved in the cyclic process?

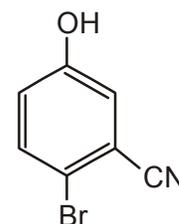


- (A) $-100 R/n4$ (B) $+100R/n4$ (C) $+200R/n4$ (D) $-200R/n4$
38. Solid $\text{Ca}(\text{HCO}_3)_2$ decomposes as
- $$\text{Ca}(\text{HCO}_3)_2(\text{s}) \rightleftharpoons \text{CaCO}_3(\text{s}) + \text{CO}_2(\text{g}) + \text{H}_2\text{O}(\text{g})$$
- If the total pressure is 0.2 bar at 420 K, what is the standard free energy change for the given reaction ($\Delta_r G^\circ$)?

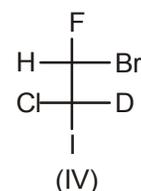
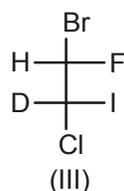
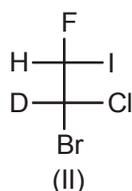
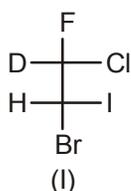
- (A) 840 kJ/mol (B) 3.86 kJ/mol (C) 6.98 kJ/mol (D) 16.083 kJ/mol

39. The IUPAC name of the following compound is:-

- (A) 4-Bromo-3-cyanophenol
 (B) 2-Bromo-5-hydroxybenzonitrile
 (C) 2-Cyano-4-hydroxybromobenzene
 (D) 6-Bromo-3-hydroxybenzonitrile



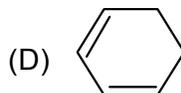
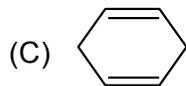
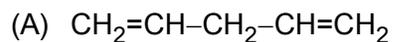
40. Number of fractions on fractional distillation of mixture of :



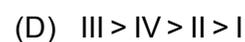
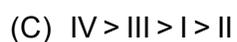
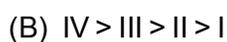
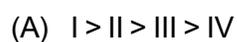
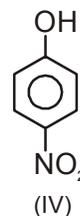
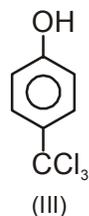
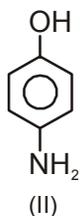
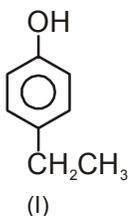
- (A) 2 (B) 3 (C) 4 (D) 1

Space for rough work

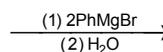
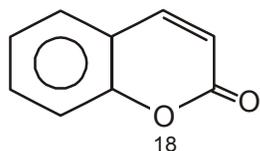
41. Which of the following compound on ozonolysis followed by oxidative hydrolysis yields propane-1, 3-dioic acid (malonic acid) as the only product?



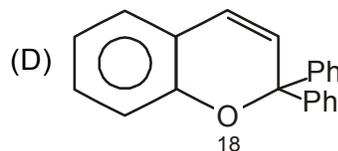
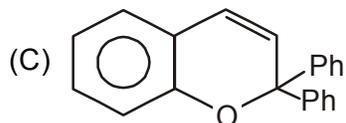
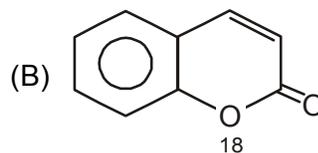
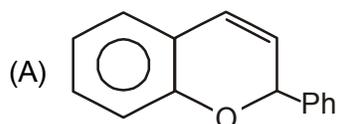
42. The correct order of acidic strength of given compound is



43.

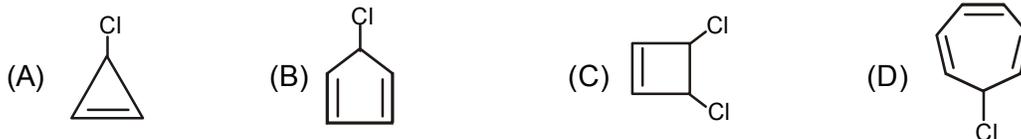


(B), Product (B) in this reaction is :

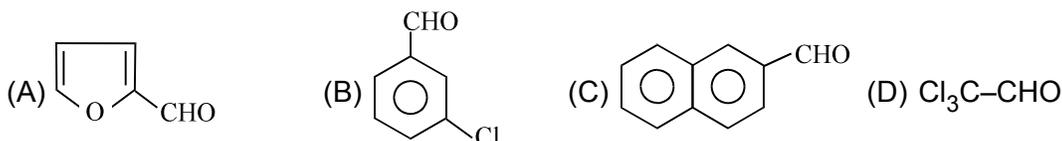


Space for rough work

44. Which of the following does not give white ppt. of AgCl when treated with AgNO₃



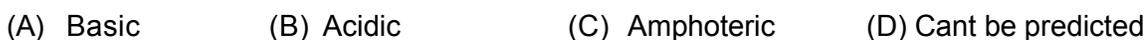
45. Which of following will not undergo Cannizaro reaction



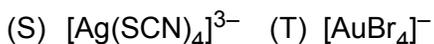
46. In which of the following Molecules σ^*2p_z Molecular orbital is filled after π^*2p_x and π^*2p_y molecular orbitals?



47. The electronegativity of H, X, O are 2.1, 0.8 and 3.5 respectively comment on the nature of compound H-O-X that is :



48. The complex which is dsp^2 hybridized and diamagnetic in nature?



49. The complex which exhibits geometrical as well optical isomersim is :



50. Incerasing order of average oxidation state of iron in Haemite(P), Magnatite (Q) and Siderite (R).



Space for rough work

51. Which of the following ions have zero value of magnetic moment ?
(A) Sc^{3+} (B) Ti^{4+} (C) Zn^{2+} (D) All of these
52. Most favourable conditions for electrovalent bonding are:
(A) low ionization potential of one atom and high electron affinity of the other atom
(B) high electron affinity and high ionization potential of both the atoms
(C) low electron affinity and low ionization potential of both the atoms
(D) high ionization potential of one atom and low electron affinity of the other atom
53. Which of the following has one lone pair of electrons on the central atom ?
(A) ICl_3 (B) SCl_4 (C) XeF_4 (D) NCl_3
54. Which of the following molecules has highest value of dipole moment ?
(A) NH_3 (B) NF_3 (C) CO_2 (D) BF_3
55. Difference between ΔH and ΔE for the combustion of liquid benzene at 27°C is
(A) 7.48 kJ (B) 3.74 kJ (C) 14.86 kJ (D) 5.73 kJ
56. In decomposition reactions enthalpy of products is mostly.....than the enthalpy of reactants?
(A) Greater (B) Lesser (C) Constant (D) Infinite
57. In the reaction $2\text{Na}_2\text{S}_2\text{O}_3 + \text{I}_2 \rightarrow \text{Na}_2\text{S}_4\text{O}_6 + 2\text{NaI}$, the oxidation state of S is -
(A) Increased (B) Decreased (C) Remains same (D) None
58. Which of following is not a redox change ?
(A) $2\text{H}_2\text{S} + \text{SO}_2 = 2\text{H}_2\text{O} + 3\text{S}$ (B) $2\text{BaO} + \text{O}_2 = 2\text{BaO}_2$
(C) $\text{BaO}_2 + \text{H}_2\text{SO}_4 = \text{BaSO}_4 + \text{H}_2\text{O}$ (D) $2\text{KClO}_3 = 2\text{KCl} + 3\text{O}_2$

Space for rough work

59. Which of the following ions are colourless-
(A) V^{3+} (B) Mn^{2+} (C) Sc^{3+} (D) V^{5+}
60. Manganese show oxidation state from + 2 to + 7. The most oxidizing state known in aqueous solution is
(A) + 7 (B) + 4 (C) + 3 (D) + 2

PART-C : BIOLOGY

61. Match the entities in Column-I with their character in Column-II regarding cell cycle :

Column-I	Column-II
(a) Leptotene	(i) Terminalisation of chiasmata
(b) Zygotene	(ii) Formation chiasmata
(c) Pachytene	(iii) Synapsis
(d) Diplotene	(iv) Chromosomes become gradually visible
(e) Diakinesis	(v) Crossing over
(A) a-(iv), b-(v), c-(iii), d-(i), e-(ii)	(B) a-(iv), b-(iii), c-(v), d-(ii), e-(i)
(C) a-(iv), b-(iii), c-(ii), d-(v), e-(i)	(D) a-(iii), b-(iv), c-(v), d-(ii), e-(i)

62. RNA and protein synthesis occurs in :

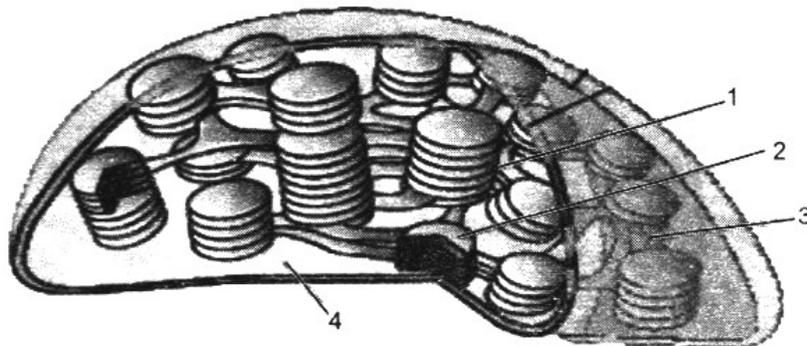
(A) G_1 -phase (B) G_0 -phase (C) G_1 -phase (D) Both (A) and (B)

63. Mitotic spindle attached with kinetochore of centromere is :

(A) Starting of prophase (B) End of prophase
(C) Starting of metaphase (D) End of metaphase

Space for rough work

64. Given diagram is a section of _____ and 1 and 4 represents :



- (A) Chloroplast, 1-Stromal lamella, 4-Granum
 (B) Chloroplast, 1-Stroma, 4-Thylakoid
 (C) Chromoplast, 1-Granum, 4-Stromal lamella
 (D) Chloroplast, 1-Granum, 4-Stroma
65. A piece of wood having no vessels (trachea) must belong to :
 (A) Teak (B) Mango (C) Pine (D) Palm
66. Inheritance of skin colour in humans is an example of
 (A) Point mutation (B) Polygenic inheritance
 (C) Codominance (D) Chromosomal aberration
67. Transformation was discovered by
 (A) Meselson and Stahl (B) Hershey and Chase
 (C) Griffith (D) Watson and Crick
68. The organism, used for alcohol fermentation, is
 (A) Aspergillus (B) Saccharomyces (C) Pseudomonas (D) Penicillium

Space for rough work

69. Nucleosome core is made of
 (A) H1, H2A, H2B and H3 (B) H1, H2A, H2B, H4
 (C) H1, H2A, H2B, H3 and H4 (D) H2A, H2B, H3 and H4
70. What is not true for genetic code ?
 (A) It is nearly universal (B) It is degenerate
 (C) It is unambiguous (D) A codon in mRNA is read in a non-contiguous
71. Given below are four methods (A–D) and their modes of action (p–s) in achieving contraception.

Select their correct matching from the four options that follow :

Method	Mode of Action
A. The pill	(p) Prevents sperms reaching cervix
B. Condom	(q) prevents sperms motility.
C. Vesectomy	(r) prevents ovulation
D. Copper T	(s) Semen contains no sperms

Codes :

- (A) A – (q), B–(r), C–(p), D–(s) (B) A – (r), B–(p), C–(s), D–(q)
 (C) A – (s), B–(p), C–(q), D–(r) (D) A – (r), B–(s), C–(p), D–(q)
72. What is true for an ideal contraceptive ?
- I. It should be user–friendly
 - II. It should be easily available.
 - III. It should be ineffective and reversible with least side effects.
 - IV. It should be effective and reversible with least side effects.
 - V. It should interfere with the sexual act of the user
- (A) All (B) I, II, III (C) I, II, IV (D) I, II, IV, V

Space for rough work

73. Sometimes the labor pains are less and uterine contractions have to be induced. What do you think the doctors inject to facilitate delivery?
- (A) Progesterone and estrogen hormones (B) Oxytocin / Pitocin
(C) FSH and LH (D) Relaxin
74. If both ovaries are removed from pregnant human female after first trimester of pregnancy then it will lead to
- (A) Abortion (B) Normal development of foetus
(C) Irregular ovulation (no fixed time interval) (D) Menarche
75. Which is a typical example of 'feedback inhibition'?
- (A) cyanide and cytochrome reaction
(B) sulpha drugs and folic acid synthesizer bacteria
(C) allosteric inhibition of hexokinase by glucose 6-phosphate
(D) reaction between succinic dehydrogenase and succinic acid.
76. During one circuit of blood from lungs to tissues and back through circulatory system, the percentage of O_2 giving up by Hb to tissues is :
- (A) 25% (B) 40% (C) 60% (D) 97%
77. Find out the source/s of energy for the synthesis of complex molecules in the atmosphere of primitive Earth :
- (A) Lightning and cosmic rays (B) Volcanic heat and UV radiation
(C) Soil radioactivity / soil high temperature (D) All of the above
78. During the successive evolution of living forms, anaerobic photoautotroph appeared before the :
- (A) Origin of life (B) Chemoheterotroph
(C) Chemoautotroph (D) Aerobic photoautotroph

Space for rough work

79. Which of the following is not a ventricle of human brain ?
(A) Metacoel (B) Paracoel (C) Neurocoel (D) Diocoel
80. Select the **incorrect** statement w.r.t plasma membrane
(A) Phospholipids are main membrane lipids
(B) Tails of membrane lipids are hydrophilic
(C) Heads of membrane lipids are found on exterior side
(D) Intrinsic proteins are embedded in the plasma membrane
81. Select the **odd** one w.r.t classification of Mango
(A) Family- Poaceae (B) Order-Sapindales
(C) Class-Dicotyledonae (D) Division- Angiospermae
82. All of the following are true for *Mycoplasma*, **except**
(A) Can grow in anerobic condition (B) Cell wall is made up of peptidoglycan
(C) Insensitive to penicillin (D) Also known as PPLO
83. Life-cycle of *Polysiphonia* and *Cedrus* respectively are
(A) Haplontic and Diplontic (B) Haplodiplontic and Diplontic
(C) Haplodiplontic and Haplontic (D) Diplontic and Haplontic
84. Opening of DNA helix and continuation of elongation process in transcription is achieved by
(A) Helicase (B) RNA polymerase
(C) Sigma-factor (D) Rho-factor
85. During primary treatment of sewage, all solids that settle forms _____.
(A) Primary sludge (B) Primary effluent
(C) Activated sludge (D) Floccs
86. Which of the given can help in shortening the period between germination and flowering?
(A) Vernalisation (B) Scarification (C) Bolting (D) Vivipary

Space for rough work

87. The stalk of the ovule by which it remains attached to placenta is called
(A) Funicle (B) Hilum (C) Micropyle (D) Chalaza
88. In mendelian dihybrid cross, out of 96 individuals obtained in F_2 generation, how many have at least one dominant allele?
(A) 6 (B) 90 (C) 16 (D) 48
89. Cholesterol lowering agent called statins are produced by
(A) *Clostridium* (B) *Monascus purpureus*
(C) *Trichoderma* (D) *Acetobacter aceti*
90. All the following properties are true for RNA, **except**
(A) Uracil is present instead of thymine
(B) Ribose sugar is present
(C) 2' OH group is absent
(D) RNA chemically more reactive as compared to DNA
91. Biomagnification is found to be maximum at which of the given organisms in an aquatic food chain?
(A) Zooplankton (B) Small fish
(C) Large fish (D) Fish-eating birds
92. Male gametes in angiosperms are formed by the division of:
(A) microspore (B) generative cell
(C) vegetative cells (D) microspore mother cell
93. In a cross between a male and female, both heterozygous for sickle cell anaemia gene, what percentage of the progeny will be diseased?
(A) 25% (B) 100% (C) 50% (D) 75%

Space for rough work

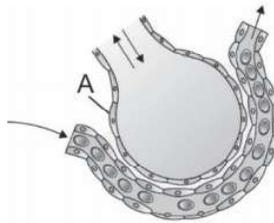
94. Ovary is one-chambered but it becomes two chambered due to the formation of a false septum in:
(A) Dianthus and Primrose (B) Mustard and Argemone
(C) Sunflower and Marigold (D) Pea and Lemon
95. Which hormone is used to induce immediate stomatal closure in leaves?
(A) Cytokinin (B) Gibberellin (C) Abscisic Acid (D) Auxin
96. Identify the incorrect statement:
(A) Viruses are obligate parasites
(B) Prions are abnormally folded infectious proteins
(C) Viroids are free RNA and lack a protein coat
(D) Lichens grow very well in polluted areas
97. In members of Basidiomycetes:
(A) Mycelium is unbranched and coenocytic
(B) Sex organs are absent and plasmogamy does not take place
(C) Asexual spores are not found but vegetative reproduction by fragmentation is common
(D) Basidiospores are produced endogenously on the basidium
98. Choose a primary metabolite with phosphorylated organic compound in its structure.
(A) Palmitic acid (B) Ribose (C) Cholesterol (D) Lecithin
99. Adrenaline released from adrenal medulla under stress and performs following function so as to cope with emergency situation, **except**
(A) Increase alertness, pupillary dilation
(B) Increase the breakdown of lipids and proteins
(C) Elevate blood glucose by converting glycogen to glucose
(D) Constrict arterioles of skeletal muscle

Space for rough work

100. The function of cilia on surface of ciliated epithelium is to
(A) Allow the movement of motile ovum in fallopian tube
(B) Facilitate secretion, absorption and easy diffusion
(C) Move dust particle towards the surface of hollow organs like nostrils to bronchioles
(D) Move mucus in specific direction over the epithelium
101. Head of which muscle protein exhibits ATPase activity?
(A) Troponin (B) Actin (C) Myosin (D) Tropomyosin
102. Which pair of hormones cause hyperglycemia?
a. Epinephrine b. Insulin c. Aldosterone d. Glucagon
(A) a, b (B) b, c (C) a, d (D) a, c
103. The immunoglobulins which protect us from inhaled and ingested pathogens is?
(A) IgM (B) IgG (C) IgE (D) IgA
104. In test tube baby programme, if the embryo is with more than 8 blastomeres, it is transferred into which region of the female reproductive tract so as to complete further development?
(A) Ampulla part (B) Ostium (C) Vestibule (D) Uterus
105. Each coxal bone is formed by fusion of
a. Ilium b. Ischium c. Pubis
Choose the **correct** option.
(A) Only a and c (B) Only a and b (C) Only b and c (D) a, b and c
106. Complete the analogy
Planaria : Protonephridia : : Amphioxus : _____
(A) Antennal glands (B) Green glands
(C) Flame cells (D) Nephridia

Space for rough work

107. Which of the following set of organisms have tissue grade of organisation, blind sac plan and exhibit radial symmetry?
- (A) *Asterias, Echinus* (B) *Pila, Aedes*
 (C) *Hydra, Physalia* (D) *Fasciola, Ascaris*
108. Cells of the loose connective tissue that play a major role to ingest cell debris and foreign matter is
- (A) Fibroblast (B) Mast cell (C) Macrophage (D) Adipocyte
109. Observe the figure given below and identify the label 'A' and nature of tissue associated with it. Choose the **correct** option



- (A) Basement membrane – Non-cellular layer mesothelium
 (B) Blood capillary – Mesothelium
 (C) Alveolar wall – One-celled thick squamous epithelium
 (D) Alveoli – Stratified endothelium
110. Brain stem forms the connection between the brain and spinal cord. The major regions that make up brain stem include all, **except**
- (A) Pons (B) Medulla oblongata (C) Cerebrum (D) Midbrain
111. A hypercalcemic and hypoglycemic hormone respectively are
- (A) Cortisol and insulin (B) PTH and insulin
 (C) TCT and glucagon (D) Glucagon and insulin

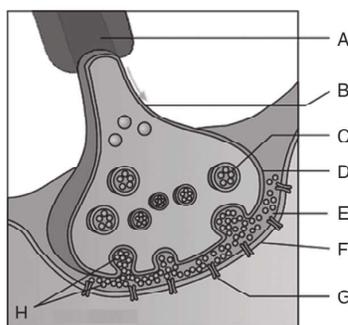
Space for rough work

112. Match the column:

Column I	Column II
A. Collagen –	1. Hormone
B. Trypsin –	2. Enzyme
C. Insulin –	3. Fight Infectious agent
D. Receptor –	4. Enable glucose transport into cells
E. GLUT-4 –	5. Sensory reception (smell, taste hormone)
F. Antibody –	6. Intercellular ground substance

(A) A-3, B-2, C-4, D-1, E-6, F-5 (B) A-6, B-2, C-1, D-5, E-4, F-3
 (C) A-1, B-4, C-2, D-5, E-3, F-6 (D) A-2, B-4, C-5, D-3, E-1, F-6

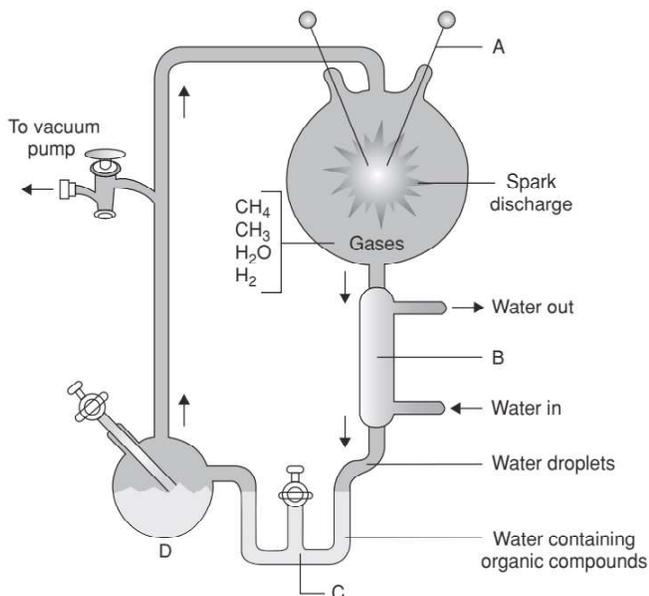
113. Identify A to H in the given figure.



- (A) A—Neurotransmitters, B—Pre-synaptic membrane, C—Receptors, D—Axon, E—Synaptic vesicles, F—Axon terminal, G—Synaptic cleft, H—Post-synaptic membrane
 (B) A—Axon, B—Axon terminal, C—Synaptic vesicles, D—Pre-synaptic membrane, E—Synaptic cleft, F—Post-synaptic membrane, G—receptors, H—Neurotransmitters
 (C) A—Receptors, B—Post-synaptic membrane, C—Pre-synaptic membrane, D—Axon terminal, E—Neurotransmitters, F—Synaptic cleft, G—Synaptic vesicles, H—Axon
 (D) A—Axon terminal, B—Neurotransmitters, C—Synaptic vesicles, D—Axon, E—Presynaptic membrane, F—Post-synaptic membrane, G—Synaptic vesicles, H—Synaptic cleft

Space for rough work

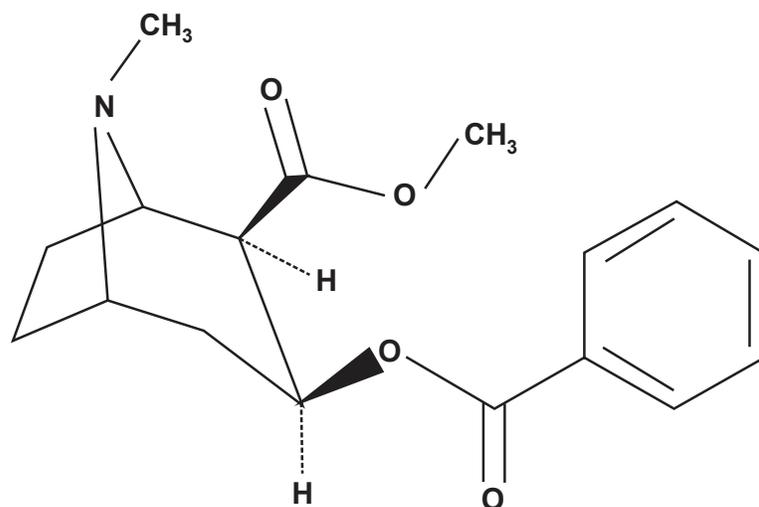
114. Of the following statements, which one is true for Mons Pubis?
- (A) It is the region of pubic hair growth found in females as well as males.
- (B) It is a cushion of proteins covered by skin and pubic hair.
- (C) It is a cushion of fats covered by skin and pubic hair.
- (D) It is a part of female internal genitalia.
115. Identify the parts A, B, C and D in the figure.



- (A) A: Liquid water in trap, B: Electrode, C: Boiling water, D: Condenser
- (B) A: Boiling water, B: Condenser, C: Electrode, D: Liquid water in trap
- (C) A: Electrode, B: Condenser, C: Liquid water in trap, D: Boiling water
- (D) A: Condenser, B: Liquid water in trap, C: Boiling water, D: Electrode

Space for rough work

116. What is shown in the figure?



- (A) Cannabinoid molecule (B) Morphine
(C) Nicotine (D) Lobeline

117. An antibody is represented as

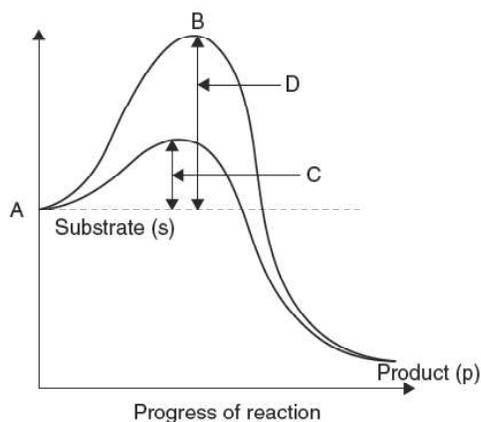
- (A) H₁L₂ (B) H₂L₂ (C) H₄L₁ (D) H₄L₄

118. Hypothyroidism causes

- (A) Irregular menstrual cycle (B) Reduced BMR
(C) Reduced production of RBC (D) All of these

Space for rough work

119. The figure below shows the conversion of a substrate into product by an enzyme. In which one of the options (a to d) the components of reaction labeled as A, B, C and D are identified correctly?



- | A | B | C | D |
|--------------------------------------|------------------|-------------------------------------|-------------------------------------|
| (A) Potential energy | Transition state | Activation energy
With enzyme | Activation energy
without enzyme |
| (B) Transition state | Potential energy | Activation energy
Without enzyme | Activation energy with
enzyme |
| (C) Potential energy | Transition state | Activation energy
Without enzyme | Activation energy with
enzyme |
| (D) Activation energy
With enzyme | Transition state | Activation energy
without enzyme | Potential energy |
120. Trachea divides into right and left primary bronchi at _____ the thoracic vertebra.
- (A) 4 (B) 5 (C) 6 (D) 9

Space for rough work

ANSWER KEYS

SCHOLARSHIP TEST

SAMPLE TEST PAPER

[For Class 12 Pass Students]

[STREAM: MEDICAL]

PHYSICS

- | | | | |
|---------|---------|---------|---------|
| 1. (A) | 2. (A) | 3. (D) | 4. (A) |
| 5. (B) | 7. (C) | 8. (B) | 9. (B) |
| 10. (B) | 11. (D) | 12. (A) | 13. (C) |
| 14. (C) | 15. (C) | 16. (A) | 17. (B) |
| 18. (C) | 19. (B) | 20. (D) | 21. (B) |
| 22. (C) | 23. (C) | 24. (C) | 25. (B) |
| 26. (B) | 27. (A) | 28. (B) | 29. (A) |
| 30. (A) | | | |

CHEMISTRY

- | | | | |
|---------|---------|---------|---------|
| 31. (B) | 32. (C) | 33. (A) | 34. (D) |
| 35. (D) | 36. (C) | 37. (A) | 38. (D) |
| 39. (B) | 40. (C) | 41. (C) | 42. (C) |
| 43. (D) | 44. (B) | 45. (D) | 46. (C) |
| 47. (A) | 48. (C) | 49. (A) | 50. (B) |
| 51. (D) | 52. (A) | 53. (B) | 54. (A) |
| 55. (B) | 56. (A) | 57. (A) | 58. (C) |
| 59. (C) | 60. (A) | | |

BIOLOGY

- | | | | |
|----------|----------|----------|----------|
| 61. (B) | 62. (D) | 63. (C) | 64. (D) |
| 65. (C) | 66. (B) | 67. (C) | 68. (B) |
| 69. (D) | 70. (D) | 71. (B) | 72. (C) |
| 73. (B) | 74. (B) | 75. (C) | 76. (A) |
| 77. (D) | 78. (D) | 79. (C) | 80. (B) |
| 81. (A) | 82. (B) | 83. (B) | 84. (B) |
| 85. (A) | 86. (A) | 87. (A) | 88. (B) |
| 89. (B) | 90. (C) | 91. (D) | 92. (B) |
| 93. (A) | 94. (B) | 95. (C) | 96. (D) |
| 97. (C) | 98. (D) | 99. (D) | 100. (D) |
| 101. (C) | 102. (C) | 103. (D) | 104. (D) |
| 105. (D) | 106. (C) | 107. (C) | 108. (C) |
| 109. (C) | 110. (C) | 111. (B) | 112. (B) |
| 113. (B) | 114. (C) | 115. (C) | 116. (B) |
| 117. (B) | 118. (D) | 119. (A) | 120. (B) |