

NEET Part Test-04

TOPIC COVERED

Physics:	Thermodynamics, Kinetic Theory, Oscillations, Waves
Chemistry:	Organic Chemistry – Some Basic Principles & Techniques, Hydrocarbons, Environmental Chemistry
Botany:	Respiration in Plants, Photosynthesis in Higher Plants, Plant Growth and Development
Zoology:	Neural Control and Coordination, Chemical Coordination and integration, Biomolecules

Duration: 3 hr 20 min

Max Marks: 720

General Instructions:

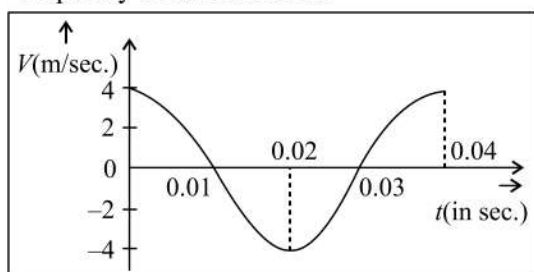
- The test will contain 200 Questions of Physics, Chemistry, Botany, and Zoology & The test will be objective type. (Attempt only 180).
- Every subject contains two Part A-35 Questions and Part B-15 Questions (Attempt only 10).
- All 35 Questions of Part-A are Compulsory to attempt
- Time given for test is 200 minutes.
- Marking is +4 for every correct answer, –1 for every wrong answer.
- You can reattempt the test in case of any technical issue.
- Test will start at 2:00 pm and students can attempt test at any time of their own preferences

PHYSICS

SECTION-A

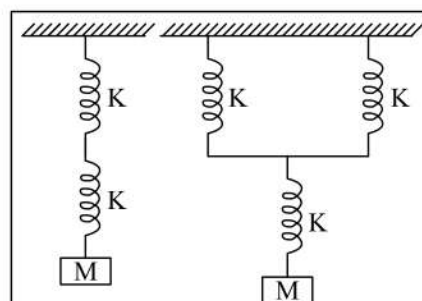
1. The acceleration of a particle in SHM at 5 cm from its mean position is 20 cm/sec^2 . The value of angular velocity in radian/second will be
 (1) 2 (2) 4
 (3) 10 (4) 14

2. The velocity-time diagram of a harmonic oscillation is shown in the adjoining figure. The frequency of oscillation is:



- (1) 25 Hz
- (2) 50 Hz
- (3) 12.25 Hz
- (4) 33.3 Hz

3. Some springs are combined in series and parallel arrangement as shown in the figure and a mass M is suspended from them. The ratio of their frequencies will be:



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

4. The acceleration due to gravity at height R above the surface of the earth is $g/4$. The periodic time of a simple pendulum in an artificial satellite at this height will be:
 - (1) $T = 2\pi\sqrt{\frac{2l}{g}}$
 - (2) $T = 2\pi\sqrt{\frac{l}{2g}}$
 - (3) Zero
 - (4) Infinity

5. Simple pendulum of large length is made equal to the radius of the earth. Its period of oscillation will be:

- (1) 84.6 min (2) 59.8 min
(3) 42.3 min (4) 21.15 min

6. A lift ascending with acceleration $g/3$. What will be the time period of a simple pendulum suspended from its ceiling if its time period in stationary lift is T ?

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

7. A simple pendulum performs simple harmonic motion about $x = 0$ with an amplitude a and time period T . The speed of the pendulum at $x = a/2$ will be:

- (1) $\frac{\sqrt{3}\pi a}{T}$ (2) $\frac{\sqrt{3}\pi a}{2T}$
(3) $\frac{\pi a}{T}$ (4) $\frac{3\pi^2 a}{T}$

8. Two particles A and B of equal masses are suspended from two massless spring constants k_1 and k_2 respectively. If the maximum velocities during oscillations are equal, the ratio of amplitudes A and B is:

- (1) $\sqrt{\frac{k_1}{k_2}}$ (2) $\frac{k_1}{k_2}$
(3) $\sqrt{\frac{k_2}{k_1}}$ (4) $\frac{k_2}{k_1}$

9. The period of oscillation of simple pendulum of length L suspended from the roof of the vehicle which moves without friction, down on an inclined plane of inclination α , is given by:

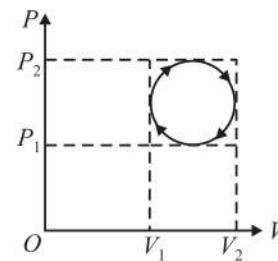
- (1) $2\pi\sqrt{\frac{L}{g \cos \alpha}}$ (2) $2\pi\sqrt{\frac{L}{g \sin \alpha}}$
(3) $2\pi\sqrt{\frac{L}{g}}$ (4) $2\pi\sqrt{\frac{L}{g \tan \alpha}}$

10. For hydrogen gas $c_p - c_v = a$ and for a oxygen gas $c_p - c_v = b$ then the relation between a and b is (where c_p & c_v are gram specific heats)

- (1) $a = 16 b$
(2) $b = 16 a$
(3) $a = b$
(4) None of these

11. In a cyclic process shown on the P - V diagram the magnitude of the work done is:

- (1) $\pi\left(\frac{P_2 - P_1}{2}\right)^2$
(2) $\pi\left(\frac{V_2 - V_1}{2}\right)^2$
(3) $\frac{\pi}{4}(P_2 - P_1)(V_2 - V_1)$
(4) $\pi(P_2V_2 - P_1V_1)$



12. For monoatomic gas the relation between pressure of a gas and temperature T for adiabatic process is $P^2 \propto T^c$ where C is.

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

13. A gas for which $\gamma = 4/3$ is heated at constant pressure. The percentage of total heat given that will be used for external work is :

- (1) 40% (2) 25%
(3) 60% (4) 20%

14. A body executes S.H.M. with an amplitude A . At what displacement from the mean position, is the potential energy of the body one-fourth of its total energy?

- (1) $\frac{A}{4}$
(2) $\frac{A}{2}$
(3) $\frac{3A}{4}$
(4) Some other fraction of A

15. Equal volume of H_2 , O_2 and He gases are at same temperature and pressure. Which of these will have large number of molecules:

- (1) H_2
(2) O_2
(3) He
(4) All the gas will have same number of molecules

16. A simple pendulum with a metallic bob has a time period T . The bob is now immersed in a non-viscous liquid and oscillated. If the density of the liquid is $1/4$ that of the metal, the time period of the same pendulum will be:

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

17. The time period of oscillations of a simple pendulum is 1 minute. If its length is increased by 44%, then its new time period of oscillation will be:

- (1) 96 s
- (2) 58 s
- (3) 82 s
- (4) 72 s

18. Two pendulums of length 1.21 m and 1.0 m start vibrating. At some instant, the two are in the mean position in same phase. After how many vibrations of the longer pendulum, the two will be in phase?

- (1) 10
- (2) 11
- (3) 20
- (4) 21

19. If 2 gm moles of a diatomic gas and 1 gm mole of a mono-atomic gas are mixed then the value of $(\gamma = C_p/C_v)$ for mixture will be :

- (1) $\frac{13}{19}$
- (2) $\frac{19}{13}$
- (3) $\frac{7}{5}$
- (4) $\frac{5}{3}$

20. The equation of motion of a particle executing simple harmonic motion is $a + 16\pi^2x = 0$. In this equation, a is the linear acceleration in m/s^2 of the particle at a displacement x in metre. Find the time period.

- (1) 0.50
- (2) 0.15
- (3) 0.155
- (4) 0.25

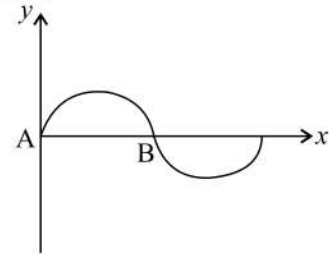
21. The particle executing simple harmonic motion has a kinetic energy $K_o \cos^2\omega t$. The maximum value of the potential energy and the total energy are respectively:

- (1) K_o and K_o
- (2) 0 and $2 K_o$
- (3) $\frac{K_o}{2}$ and K_o
- (4) K_o and $2 K_o$

22. Which of the following statement is true according to kinetic of gases?

- (1) The collision between two molecules is inelastic and the time between two collisions is less than the time taken during the collision.
- (2) There is a force of attraction between the molecules
- (3) All the molecules of a gas move with same velocity
- (4) The average of the distances travelled between two successive collision is mean free path

23. The figure shows an instantaneous profile of a rope carrying a progressive wave moving from left to right, then



- (1) the phase at A is greater than the phase at B
- (2) the phase at B is greater than the phase at A
- (3) A is moving upwards
- (4) B is moving upwards

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

24. The velocities of sound at the same pressure in two monoatomic gases of densities ρ_1 and ρ_2 are v_1 and v_2 respectively. If $\frac{\rho_1}{\rho_2} = 4$, then the value of v_1/v_2 is:

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

25. Two waves of wave length 2 m and 2.02 m respectively moving with the same velocity and superimpose to produce 2 beats per second. The velocity of the waves is:

- (1) 400.0 m/s
- (2) 402 m/s
- (3) 404 m/s
- (4) 406 m/s

26. The equation of state for 22 g of CO_2 at a pressure P and temperature T, when occupying a volume V, will be: (where R is the gas constant.)

- (1) $PV = 5 RT$
- (2) $PV = (5/2) RT$
- (3) $PV = (5/16) RT$
- (4) $PV = (1/2) RT$

27. An air column in pipe, which is closed at one end will be in resonance with a vibrating tuning fork of frequency 264 Hz if the length of the column in cm is: [$v = 330$ m/s]

- (1) 31.25
- (2) 62.50
- (3) 110
- (4) 125

28. A hollow metallic tube of length L and closed at one end produce resonance with a tuning fork of frequency n . The entire tube is then heated carefully so that at equilibrium temperature its length changes by l . If the change in velocity V of sound is v , the resonance will now be produced by tuning fork of frequency.

- (1) $(V + v)/[4(L + l)]$
- (2) $(V + v)/[4(L - l)]$
- (3) $(V - v)/[4(L + l)]$
- (4) $(V - v)/[4(L - l)]$

29. A wave in a string has an amplitude of 2 cm. The wave travels in the +ve direction of x axis with a speed of 128 m/s and it is noted that 5 complete waves fit in 4 m length of the string. The equation describing the wave is:

- (1) $y = (0.02)\text{m} \sin(7.85x - 1005t)$
- (2) $y = (0.02)\text{m} \sin(7.85x + 1005t)$
- (3) $y = (0.02)\text{m} \sin(15.7x - 2010t)$
- (4) $y = (0.02)\text{m} \sin(15.7x + 2010t)$

30. A tuning fork of frequency 512 Hz makes 4 beats per second with the vibrating string of a piano. The beat frequency decreases to 2 beats per seconds when the tension in the piano string is slightly increased. The frequency of the piano string before increasing the tension was:

- (1) 508 Hz
- (2) 510 Hz
- (3) 514 Hz
- (4) 516 Hz

31. If the root mean square speed of hydrogen molecules is equal to root mean square speed of oxygen molecules at 47°C , the temperature of hydrogen is:

- (1) 20 K
- (2) 47 K
- (3) 50 K
- (4) 80 K

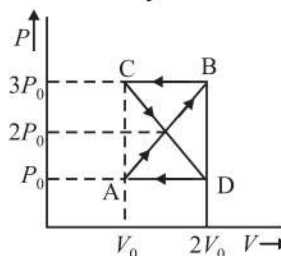
32. If n_1 , n_2 and n_3 are the fundamental frequencies of three segments into which a string is divided, then the original fundamental frequency n of the string is given by:

- (1) $\frac{1}{n} = \frac{1}{n_1} + \frac{1}{n_2} + \frac{1}{n_3}$
- (2) $\frac{1}{\sqrt{n}} = \frac{1}{\sqrt{n_1}} + \frac{1}{\sqrt{n_2}} + \frac{1}{\sqrt{n_3}}$
- (3) $\sqrt{n} = \sqrt{n_1} + \sqrt{n_2} + \sqrt{n_3}$
- (4) $n = n_1 + n_2 + n_3$

33. The amount of heat energy required to raise the temperature of 1 g of Helium at NTP (at constant pressure), from T_1 K to T_2 K is:

- (1) $\frac{5}{4} N_a k_B \left(\frac{T_2}{T_1} \right)$
- (2) $\frac{5}{8} N_a k_B (T_2 - T_1)$
- (3) $\frac{5}{2} N_a k_B (T_2 - T_1)$
- (4) $\frac{5}{4} N_a k_B (T_2 - T_1)$

34. A thermodynamic system undergoes cyclic process ABCDA as shown in fig. The work done by the system in the cycle is:



- (1) $P_0 V_0$
- (2) $2P_0 V_0$
- (3) $\frac{P_0 V_0}{2}$
- (4) Zero

35. 16 tuning forks are arranged in increasing order of frequency. Any two consecutive tuning forks when sounded together produce 8 beats per second. If the frequency of last tuning fork is twice that of first then the frequency of first tuning fork is:

- (1) 60
- (2) 80
- (3) 100
- (4) 120

SECTION-B

(ATTEMPT ANY 10 QUESTIONS)

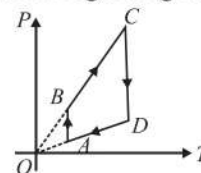
36. A refrigerator transfer 180 joule of energy in one second from temperature -3°C to 27°C . Calculate the average power consumed, assuming no energy losses in the process.

- (1) 18 W
- (2) 54 W
- (3) 20 W
- (4) 120 W

37. A sonometer wire resonates with a given tuning fork forming standing waves with five antinodes between the two bridges when a mass of 9 kg is suspended from the wire. When this mass is replaced by mass M, the wire resonates with the same tuning fork forming three antinodes for the same positions of the bridges. Then find the value of square root of M.

- (1) 5
- (2) 10
- (3) 25
- (4) None

38. A P-T graph is shown for a cyclic process. Select correct statement regarding this



- (1) During process CD, work done by gas is negative
- (2) During process AB, work done by gas is positive
- (3) During process BC internal energy of system increases
- (4) During process BC internal energy of system decreases

39. For a certain process, pressure of diatomic gas varies according to the relation $P = aV^2$, where a is constant. What is the molar heat capacity of the gas for this process?

- (1) $\frac{17R}{6}$ (2) $\frac{6R}{17}$
 (3) $\frac{13R}{6}$ (4) $\frac{16R}{7}$

40. For a certain organ pipe three successive reasonable frequencies are observed at 425, 595 and 765 Hz respectively. Taking the speed of sound in air to be 340 m/sec

- (i) whether the pipe is closed end or open end
 (ii) determine the length of pipe.
 (1) closed end, 1 m (2) open end, 1 m
 (3) closed end, 2 m (4) open end, 2 m

41. Two sources of sound placed close to each other, are emitting progressive waves given by

$$y_1 = 4 \sin 600 \pi t \text{ and } y_2 = 5 \sin 608 \pi t$$

An observer located near these two sources will hear:

- (1) 8 beats per second with intensity ratio 81 : 1 between waxing and waning
 (2) 4 beats per second with intensity ratio 81 : 1 between waxing and waning
 (3) 4 beats per second with intensity ratio 25 : 16 between waxing and waning
 (4) 8 beats per second with intensity ratio 25 : 16 between waxing and waning

42. A Carnot engine whose sink is at 300 K has an efficiency of 40%. By how much amount sink temperature decreases so as to increase its efficiency by 50% of original efficiency?

- (1) 150 K
 (2) 250 K
 (3) 300 K
 (4) 450 K

43. Frequency of tuning fork A is 256 Hz. It produces four beats/sec with tuning fork B. When filing applied at tuning fork B then 6 beats/s are heard. Frequency of B is:

- (1) 252
 (2) 260 Hz
 (3) (A) & (B) both
 (4) 264

44. For waves propagating in a medium, identify the property that is independent of the others:

- (1) Velocity
 (2) Wavelength
 (3) Frequency
 (4) All these depend on each other

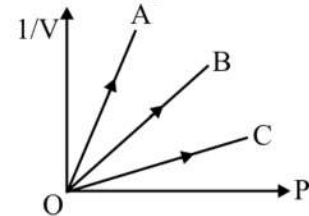
45. If the ratio of specific heat of a gas at constant pressure to that at constant volume is γ , the change in internal energy of gas, when the volume changes from V to $2V$ at constant pressure P , is:

- (1) $\frac{PV}{(\gamma-1)}$
 (2) PV
 (3) $\frac{R}{(\gamma-1)}$
 (4) $\frac{\gamma PV}{(\gamma-1)}$

46. The efficiency of a Carnot's engine at a particular source and sink temperature is $1/2$. When the sink temperature is reduced by 100°C , the engine efficiency becomes $1/3$. Find the source temperature.

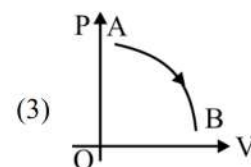
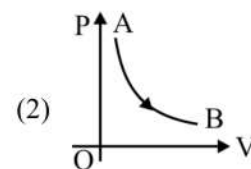
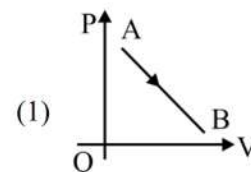
- (1) 300 K
 (2) 600 K
 (3) 900 K
 (4) 1200 K

47. Figure shows the isotherms of a fixed mass of an ideal gas at three temperatures T_A , T_B and T_C then



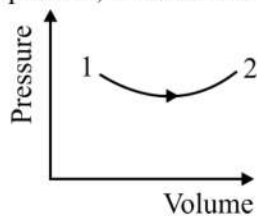
- (1) $T_A > T_B > T_C$ (2) $T_A < T_B < T_C$
 (3) $T_B < T_A < T_C$ (4) $T_A = T_B = T_C$

48. During which of the following thermodynamic process represented by PV diagram the heat energy absorbed by system may be equal to area under PV graph?



- (4) All of these

49. Consider the process on a system shown in figure. During the process, the work done by the system.



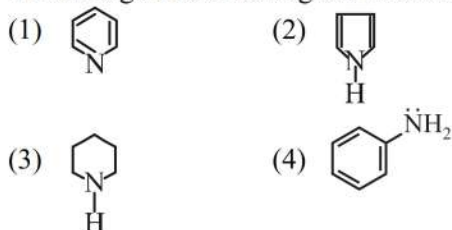
- (1) Continuously increases
- (2) Continuously decreases
- (3) First increase then decreases
- (4) First decreases then increases

50. A Carnot engine, having an efficiency of $\eta = \frac{1}{10}$ as heat engine is used as a refrigerator. If the work done on the system is 10 J, the amount of energy absorbed from the reservoir at lower temperature is:
- (1) 99 J
 - (2) 90 J
 - (3) 1 J
 - (4) 100 J

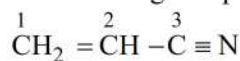
CHEMISTRY

SECTION - A

51. The strongest base among the following is:



52. The correct hybridization states of carbon atoms in the following compound are:—



- (1) $\text{C}^1 = \text{sp}$, $\text{C}^2 = \text{sp}^3$, $\text{C}^3 = \text{sp}^2$
 (2) $\text{C}^1 = \text{sp}^2$, $\text{C}^2 = \text{sp}^3$, $\text{C}^3 = \text{sp}^3$
 (3) $\text{C}^1 = \text{sp}^2$, $\text{C}^2 = \text{sp}^2$, $\text{C}^3 = \text{sp}$
 (4) $\text{C}^1 = \text{sp}^3$, $\text{C}^2 = \text{sp}^3$, $\text{C}^3 = \text{sp}^3$


53. The decreasing order of boiling points is

- (1) n-Pentane > iso-Pentane > neo-Pentane
 (2) iso-Pentane > n-Pentane > neo-Pentane
 (3) neo-Pentane > iso-Pentane > n-Pentane
 (4) n-Pentane > neo-Pentane > iso-Pentane

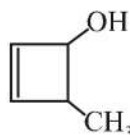
54. The order of reactivity of alkyl halides in Wurtz reaction is _____.

- (1) $\text{R-I} > \text{R-Br} > \text{R-Cl}$
 (2) $\text{R-I} < \text{R-Br} < \text{R-Cl}$
 (3) $\text{R-Br} > \text{R-I} < \text{R-Cl}$
 (4) $\text{R-I} > \text{R-Cl} > \text{R-Br}$

55. Which of following has lowest pK_a value?

- (1) $\text{Cl-CH}_2\text{-CO}_2\text{H}$
 $\text{Cl-CH}_2\text{-CO}_2\text{H}$

 (2) $\text{Cl}_3\text{C-CO}_2\text{H}$
 (3) $\text{CH}_3\text{-CO}_2\text{H}$

56. The IUPAC name of the below mentioned compound is:



- (1) 3-Methylcyclobut-1-en-2-ol
 (2) 4-Methylcyclobut-2-en-1-ol
 (3) 4-Methylcyclobut-1-en-3-ol
 (4) 2-Methyl cyclobut-3-en-1-ol

57. Which of the compounds with molecular formula C_5H_{10} yields acetone on ozonolysis _____.

- (1) 3-Methyl-1-butene
 (2) Cyclopentene
 (3) 2-Methyl-1-butene
 (4) 2-Methyl-2-butene

58. Which of the following acids on decarboxylation gives isobutane _____.

- (1) 2,2-dimethyl butanoic acid
 (2) 2,2-dimethyl propanoic acid
 (3) 3-Methyl pentanoic acid
 (4) 2-Methyl butanoic acid

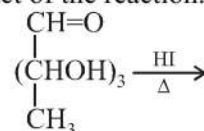
59. Ozonolysis of 3-methyl-1-butene gives a mixture of _____.

- (1) Propanal and ethanol
 (2) Propanone and ethanol
 (3) 2-Methylpropanal and methanol
 (4) Butanone and methanal

60. Compounds with $\text{C}_4\text{H}_{11}\text{N}$ as molecular formula can exhibit—

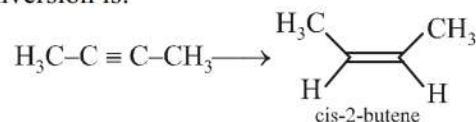
- (1) Position isomerism
 (2) Metamerism
 (3) Functional isomerism
 (4) All of the above

61. Identify product of the reaction.



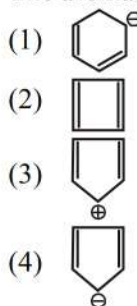
- (1) n-Pentane (2) 2-Pentane
 (3) 1, 3-Pentadiene (4) 3-Pentene

62. The most suitable reagent for the following conversion is:



- (1) Na/liquid NH_3 (2) $\text{H}_2, \text{Pd/C, quinoline}$
 (3) Zn/HCl (4) $\text{Hg}^{2+}/\text{H}^+, \text{H}_2\text{O}$

63. The aromatic compound among the following is:



64. Which one of the following is not a common component of Photochemical Smog

- (1) Ozone
 (2) Acrolein
 (3) Peroxyacetyl nitrate
 (4) Chlorofluorocarbons

65. The correct order of pka is:

- (I) CH_3COOH
 (II) $\text{CH}_3\text{CH}_2\text{COOH}$
 (III) $\text{C}_6\text{H}_5\text{CH}_2\text{COOH}$
 (IV) $\text{CH}_3 - \overset{\text{O}}{\parallel}{\text{C}} - \text{CH}_2 - \text{COOH}$

- (1) $\text{IV} > \text{III} > \text{II} > \text{I}$
 (2) $\text{III} > \text{IV} > \text{II} > \text{I}$
 (3) $\text{IV} > \text{II} > \text{III} > \text{I}$
 (4) $\text{II} > \text{I} > \text{III} > \text{IV}$

66. Which oxide of nitrogen is not a common pollutant introduced into the atmosphere both due to natural and human acidity?

- (1) N_2O
 (2) NO_2
 (3) N_2O_5
 (4) NO

67. The compound having isobutyl group among the following is:

- (1) $\text{CH}_3 - \underset{|}{\text{CH}} - \text{CH}_2 - \text{CH}_3$
 (2) $\text{CH}_3 - \text{CH}_2 - \text{CH}_2 - \text{CH}_2$
 (3) $\begin{array}{c} \text{CH}_3 \\ | \\ \text{H}_3\text{C} - \text{C} - \\ | \\ \text{CH}_3 \end{array}$
 (4) $\begin{array}{c} \text{H}_3\text{C} \\ \diagup \\ \text{H}_3\text{C} \end{array} > \text{CH} - \text{CH}_2 -$

68. Elimination reaction of 2-Bromopentane to form pent-2-ene is-

- (a) β -Elimination reaction
 (b) Follows Zaitsev rule
 (c) Dehydrohalogenation reaction
 (d) Dehydration reaction
 (1) (a), (c), (d)
 (2) (b), (c), (d)
 (3) (a), (b), (d)
 (4) (a), (b), (c)

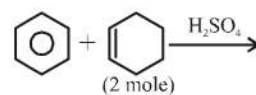
69. Concentration of Peroxy Acetyl Nitrate (PAN) is maximum in:

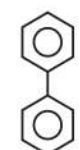

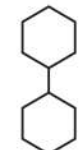

- (1) Fog
 (2) Smoke
 (3) Smog
 (4) Photochemical smog

70. Which one of the following statements regarding photochemical smog is not correct?

- (1) Photochemical smog is formed through photochemical reaction involving solar energy
 (2) Photochemical smog does not cause irritation in eyes and throat
 (3) Carbon monoxide does not play any role in photochemical smog formation
 (4) Photochemical smog is an oxidising agent in character

71. The major product obtained in the given reaction is:



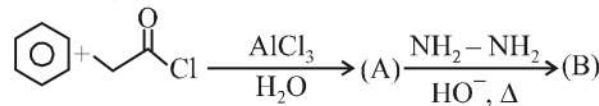
- (1)  (2) 
 (3)  (4) 



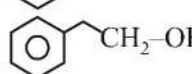
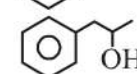
72. The order of decreasing stability of the anions



- (1) $\text{I} > \text{II} > \text{III} > \text{IV}$ (2) $\text{IV} > \text{III} > \text{II} > \text{I}$
 (3) $\text{IV} > \text{I} > \text{II} > \text{III}$ (4) $\text{I} > \text{II} > \text{IV} > \text{III}$

73. Product (B) in the below mentioned reaction is:



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

74. Decreasing order of stability of following carbocations is:




- (A) $m - \text{CH}_3\text{OPhCH}_2^+$
 (B) $p - \text{CH}_3\text{OPhCH}_2^+$
 (C) PhCH_2^+
 (D) $p - \text{NO}_2\text{PhCH}_2^+$

- (1) $\text{A} > \text{B} > \text{C} > \text{D}$ (2) $\text{C} > \text{B} > \text{A} > \text{D}$
 (3) $\text{C} > \text{B} > \text{A} > \text{D}$ (4) $\text{B} > \text{C} > \text{A} > \text{D}$

75. The maximum number of stereoisomers possible for 3-hydroxy-2-methyl butanoic acid is:

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

76. The increasing order of the reactivity of the following compounds towards electrophilic aromatic substitution reaction is:

- (I)  (II) 
 (III) 

- (1) $\text{III} < \text{I} < \text{II}$ (2) $\text{III} < \text{II} < \text{I}$
 (3) $\text{II} < \text{I} < \text{III}$ (4) $\text{II} < \text{III} < \text{I}$

77. Which of the following is not a green house gas?

- (1) Hydrogen (2) Carbon dioxide
(3) Methane (4) Nitrous oxide or N₂O

78. The most stable carboxylate ion among the following is:

- (1) $\text{H}_3\text{C}-\overset{\text{O}}{\parallel}{\text{C}}-\text{O}^-$
(2) $\text{Cl}-\text{CH}_2-\overset{\text{O}}{\parallel}{\text{C}}-\text{O}^-$
(3) $\text{F}-\text{CH}_2-\overset{\text{O}}{\parallel}{\text{C}}-\text{O}^-$
(4) $(\text{F})_2-\text{CH}-\overset{\text{O}}{\parallel}{\text{C}}-\text{O}^-$

79. Which of the following is a sink for CO?

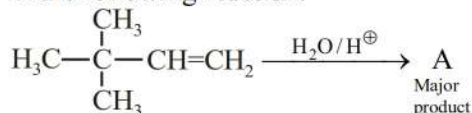
- (1) Micro organism present in the soil
(2) Oceans
(3) Plants
(4) Haemoglobin

80. 2-Butene $\xrightarrow{\text{HBr}}$

Product of above reaction will be:

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

81. In the following reaction:



The major product is:

- (1) $\text{H}_3\text{C}-\overset{\text{CH}_3}{\underset{\text{CH}_3}{\text{C}}}-\underset{\text{OH}}{\text{CH}}-\text{CH}_3$
(2) $\text{H}_3\text{C}-\overset{\text{CH}_3}{\underset{\text{CH}_3}{\text{C}}}-\underset{\text{OH}}{\text{CH}_2}-\text{CH}_2$
(3) $\text{H}_3\text{C}-\overset{\text{CH}_3}{\underset{\text{OH}}{\text{C}}}-\underset{\text{CH}_3}{\text{CH}}-\text{CH}_3$
(4) $\text{H}_2\text{C}-\overset{\text{CH}_3}{\underset{\text{OH}}{\text{C}}}-\text{CH}_2-\text{CH}_3$

82. Predict the product 'C' obtained in the following reaction of 1-butyne



- (1) $\text{CH}_3-\text{CH}_2-\text{CH}_2-\overset{\text{I}}{\underset{\text{Cl}}{\text{C}}}-\text{H}$
(2) $\text{CH}_3-\text{CH}_2-\overset{\text{I}}{\text{CH}}-\text{CH}_2\text{Cl}$
(3) $\text{CH}_3-\text{CH}_2-\overset{\text{I}}{\underset{\text{Cl}}{\text{CH}}}-\text{CH}_3$
(4) $\text{CH}_3-\overset{\text{Cl}}{\text{CH}}-\text{CH}_2-\text{CH}_2\text{I}$

83. The correct statement among the following is:

- (1) Allyl carbocation ($\text{CH}_2=\text{CH}-\text{CH}_2^+$) is more stable than propyl carbocation
(2) Propyl carbocation is more stable than allyl carbocation
(3) Both are equally stable
(4) None of the above

84. The correct order of acidity among the following is:

- (1) $\text{CH}_3\text{COOH} > \text{BrCH}_2\text{COOH} > \text{ClCH}_2\text{COOH} > \text{FCH}_2\text{COOH}$
(2) $\text{FCH}_2\text{COOH} > \text{CH}_3\text{COOH} > \text{BrCH}_2\text{COOH} > \text{ClCH}_2\text{COOH}$
(3) $\text{BrCH}_2\text{COOH} > \text{ClCH}_2\text{COOH} > \text{FCH}_2\text{COOH} > \text{CH}_3\text{COOH}$
(4) $\text{FCH}_2\text{COOH} > \text{ClCH}_2\text{COOH} > \text{BrCH}_2\text{COOH} > \text{CH}_3\text{COOH}$

85. Halogens in an organic compound can be detected by:

- (1) Duma's method
(2) Carius method
(3) Kjeldahl's method
(4) Chromatography

SECTION-B

(ATTEMPT ANY 10 QUESTIONS)

86. Which of the following is Herbicide?

- (1) Sodium chlorate
(2) Organo carbonates
(3) Potassium dihydrogen phosphate
(4) Ammonium nitrate

87. Which of the following carbocation is least stable?

- (1) $\text{C}_6\text{H}_5\text{CH}_2^+$
(2) $\text{CH}=\text{CH}_2^+$
(3) $\text{CH}_2=\text{CH}-\text{CH}_2^+$
(4) $\text{H}_3\text{C}-\overset{\oplus}{\text{C}}-\text{H}$

88. Reaction of HBr with propene in the presence of peroxide gives

- (1) 3-bromo propane
(2) Allyl bromide
(3) n-propyl bromide
(4) Isopropyl bromide

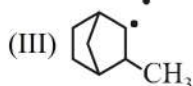
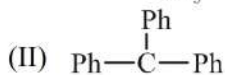
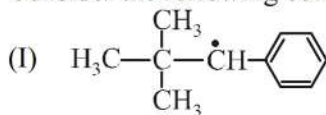
89. Which of the following alkenes will react faster with H₂ under catalytic hydrogenation conditions: [R = Alkyl Substituent]

- (1) $\text{R}-\text{C}(\text{R})=\text{C}(\text{R})-\text{R}$ (2) $\text{R}-\text{C}(\text{R})=\text{C}(\text{H})-\text{H}$
(3) $\text{R}-\text{C}(\text{R})=\text{C}(\text{H})-\text{H}$ (4) $\text{R}-\text{C}(\text{H})=\text{C}(\text{H})-\text{H}$

90. The dihedral angle of the least stable conformer of ethane is:

- (1) 60° (2) 0°
 (3) 120° (4) 180°

91. Consider the following compounds.



Hyperconjugation occurs in:

- (1) II only (2) III only
 (3) I and III (4) I only

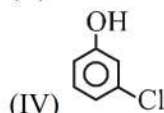
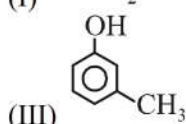
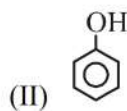
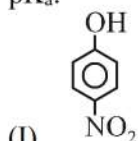
92. Pyrolysis of alkanes is a ____.

- (1) Nucleophilic addition reaction
 (2) Free radical substitution reaction
 (3) Electrophilic addition reaction
 (4) Free radical elimination reaction

93. The most suitable reagent among the following to distinguish compound (III) from rest of the compounds is:

- (I) $\text{CH}_3 - \text{C} \equiv \text{C} - \text{CH}_3$
 (II) $\text{CH}_3 - \text{CH}_2 - \text{CH}_2 - \text{CH}_3$
 (III) $\text{CH}_3 - \text{CH}_2 - \text{C} \equiv \text{CH}$
 (IV) $\text{CH}_3 - \text{CH} = \text{CH}_2$
 (1) Br_2/CCl_4
 (2) $\text{Br}_2/\text{CH}_3\text{COOH}$
 (3) Alk. KMnO_4
 (4) Ammoniacal AgNO_3

94. Arrange followings in correct decreasing order of pK_a :



- (1) $\text{I} > \text{II} > \text{IV} > \text{III}$ (2) $\text{III} > \text{IV} > \text{II} > \text{I}$
 (3) $\text{III} > \text{II} > \text{IV} > \text{I}$ (4) $\text{III} > \text{I} > \text{II} > \text{IV}$

95. The most suitable method of separation of 1 : 1 mixture of ortho and para-nitrophenols is:

- (1) Chromatography
 (2) Crystallisation
 (3) Steam distillation
 (4) Sublimation

96. Nitrobenzene can be prepared from benzene by using a mixture of conc. HNO_3 and conc. H_2SO_4 . In the mixture, nitric acid acts as a/an:

- (1) Catalyst
 (2) Reducing agent
 (3) Acid
 (4) Base

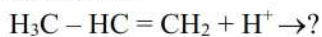
97. The Prussian blue colour obtained during the test of nitrogen by Lassaigne's test is due to the formation of

- (1) $\text{Fe}_4[\text{Fe}(\text{CN})_6]_3$
 (2) $\text{Na}_3\text{Fe}(\text{CN})_6$
 (3) $\text{Fe}(\text{CN})_3$
 (4) $\text{Na}_4[\text{Fe}(\text{CN})_5\text{NOS}]$

98. Which of the following is correct with respect to -I effect of the substituents? (R = alkyl)

- (1) $-\text{NH}_2 > -\text{OR} > -\text{F}$
 (2) $-\text{NR}_2 < -\text{OR} > -\text{F}$
 (3) $-\text{NH}_2 < -\text{OR} < -\text{F}$
 (4) $-\text{NR}_2 > -\text{OR} > -\text{F}$

99. Electrophilic addition reactions proceed in two steps. The first step involves the addition of an electrophile. Name of the major intermediate formed in the first step of the following addition reaction is:



- (1) 2° carbanion (2) 1° carbocation
 (3) 2° carbocation (4) 1° carbanion

100. Among the following, the one that is not a green house gas is:

- (1) Nitrous oxide
 (2) Methane
 (3) Ozone
 (4) Sulphur dioxide

BOTANY

SECTION - A

101. Increased vacuolation is a feature of cells of which of the following growth phase in plants?

- (1) Phase of cell division
- (2) Phase of elongation
- (3) Phase of differentiation
- (4) Phase of maturation

102. If an etiolated stem could be first saturated with auxin by spraying and then exposed to a streak of light from one side, it will

- (1) Bend towards the light
- (2) Bend away from the light
- (3) Grow straight upwards
- (4) Be prevented from growing

103. Which of the following plant hormones is **not** acidic in nature?

- (1) Gibberellin
- (2) Auxin
- (3) Cytokinin
- (4) ABA

104. Auxin promotes the apical dominance whereas it is counteracted by _____.

Complete the statement by choosing the **correct** option.

- (1) Gibberellin
- (2) Cytokinin
- (3) Ethylene
- (4) ABA

105. Which phytohormone stimulates cell division and delays senescence?

- (1) Auxins
- (2) Gibberellins
- (3) Cytokinins
- (4) Vernalins

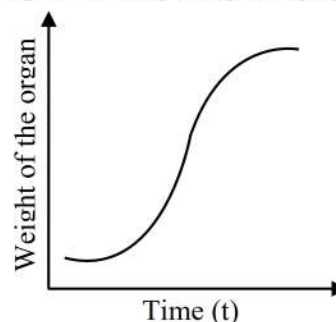
106. Growth is measured by all of the following parameters, **except**

- (1) Increase in fresh weight
- (2) Increase in cell number
- (3) Increase in life-span
- (4) Increase in cell size

107. For flowering, critical dark period should always be exceeded in

- (1) Long day plants
- (2) Short day plants
- (3) Day neutral plants
- (4) All type of plants

108. If W_0 and W_1 are initial and final weight of a plant organ and r and e are growth rate and base of natural logarithms respectively, then, which of the following equations will satisfy the growth of that organ represented by the given graph?



- (1) $W_1 = W_0 e^{rt}$
- (2) $W_1 = W_0/e^{rt}$
- (3) $W_1 = W_0 + e^{rt}$
- (4) $W_1 = W_0.r/e^t$

109. Phytohormones are composed of different types of chemical compounds. Match the following columns and choose the **correct** option.

	Column I (composition)		Column II (Phytohormone)
a.	Indole compounds	(i)	Cytokinins
b.	Terpenes	(ii)	Auxins
c.	Gas	(iii)	Gibberellins
d.	Adenine derivatives	(iv)	Ethylene

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

110. Arithmetic growth of plants is mathematically expressed by the given equation

$$L_t = L_0 + rt$$

What does 'r' indicates in this equation.

- (1) Growth rate during log phase
- (2) Length of organ at time 'zero'
- (3) Total growth per unit time
- (4) Elongation per unit time

111. CO_2 concentrating steps are found in

- (1) C_3 plants
- (2) C_4 plants
- (3) CAM plants
- (4) Temperate plants only

112. Match the following

	Column I		Column II
a.	Auxin	(i)	Root hair formation
b.	Cytokinin	(ii)	Seed development
c.	Ethylene	(iii)	Xylem differentiation
d.	ABA	(iv)	Nutrient mobilisation

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

113. Phytochrome is responsible for

- (1) Flowering
- (2) Seed germination
- (3) Transpiration
- (4) Both (1) & (2)

114. “ A is a metabolite which is common product formed during respiratory breakdown of fats, proteins and carbohydrates. It is also involved in the biosynthesis of B ”.

Select the option which **correctly** fills A and B.

	A	B
(1)	Fructose-1, 6- biphosphate	Alkaloids
(2)	Pyruvic acid	Terpenes
(3)	Glucose-6-phoshate	Amino acids
(4)	Acetyl CoA	Carotenoids

115. Identify the **correct** statement w.r.t. fermentation.

- (1) It is a metabolic process in which oxidation of substrate occurs without any external electron acceptor
- (2) It is a reaction occurs in cytoplasm of aerobic bacteria and in mitochondria of eukaryotes
- (3) It involves synthesis of 1 molecule of ATP and NADH
- (4) It involves complete oxidation of pyruvate

116. Consider the following statements and state **true (T)** or **false (F)**.

- A. Respiratory pathway is better to consider as amphibolic pathway.
- B. *Saccharomyces* is used in alcoholic fermentation.
- C. The correct sequence of electron acceptor in ETS is cyte c, cyte b, cyt a and cyt a₃.

	A	B	C
(1)	T	F	F
(2)	F	T	T
(3)	T	T	F
(4)	F	F	T

117. Read the given statements and choose the **correct** option

- A. Yeasts poison themselves to death when the concentration of alcohol reaches about 10%.
- B. During glucose activation phase of glycolysis, 2 ATP are consumed.

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

118. How many ATP molecules will be formed from complete oxidation of two molecules of 3-PGAL in an eukaryotic cell?

- (1) 34
- (2) 40
- (3) 36
- (4) 42

119. In electron transport system of respiration, which enzyme complex is **odd** w.r.t. electron carrier?

- (1) Complex I
- (2) Complex III
- (3) Complex IV
- (4) Complex V

120. During aerobic respiration which of the following conversions shows substrate level phosphorylation?

(1)	Oxalosuccinic acid	→	α-ketoglutaric acid
(2)	Fumaric acid	→	Malic acid
(3)	Succinyl CoA	→	Succinic acid
(4)	Citric acid	→	Cis-Aconitic acid

121. During both lactic acid and alcoholic fermentation

- a. Less than 7% of the energy in glucose is released.
 - b. CO₂ is released.
 - c. All the released energy gets trapped as high energy bonds of ATP.
- (1) Only a is correct
 - (2) All a, b and c are correct
 - (3) Only b and c are correct
 - (4) Only b is correct

122. Which is not true for CAM plants?

- (1) Scotoactive opening of stomata
- (2) Dark acidification of cytoplasm
- (3) Separation of Hatch – Slack cycle and C₃ cycle in time
- (4) Single carboxylation

123. Select the option that **correctly** states the RQ of fat acids, proteins and carbohydrates, respectively.

	Fatty acid	Proteins	Carbohydrates
(1)	0.7	1.33	0.9
(2)	1.33	0.9	1
(3)	0.7	0.9	1
(4)	0.7	1	0.9

124. During ETS, the terminal electron acceptor is

- (1) Cyt c_1 (2) UQH₂
 (3) O₂ (4) Cyt a_3

125. In photorespiration, release of CO₂ occurs in

- (1) Mitochondria (2) Chloroplast
 (3) Peroxisomes (4) All of these

126. Photorespiration is shown by

- (1) C₄ plants (2) C₃ plants
 (3) All plants (4) Tropical plants

127. Number of carboxylations reactions during fixation of one CO₂ molecule in sorghum and maize is

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

128. In a chromatogram the colour of chlorophyll a appears

- (1) Yellow green (2) Bright or blue green
 (3) Yellow-orange (4) Yellow

129. Incorrect statement in relation to chemiosmotic hypothesis is

- (1) Primary electron acceptor is located towards outer side of membrane
 (2) NADP reductase is located on lumen side of thylakoid membrane
 (3) Splitting of water releases protons in the lumen of thylakoid membrane
 (4) Decrease in pH of thylakoid lumen due to proton accumulation

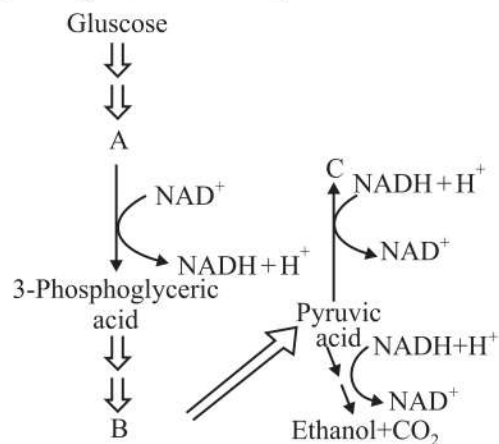
130. Z-scheme in thylakoid membrane is concerned with

- (1) Reduction of NAD⁺
 (2) Reduction of CO₂
 (3) Electron transfer
 (4) All of these

131. Photolysis of water is related to

- (1) PS-II (2) PS-I
 (3) Cytochrome (4) NADP⁺

132. What does A, B and C depict in the given pathway of anerobic respiration?



	A	B	C
(1)	Lactic acid	Phosphoenol Pyruvate	Glyceraldehyde-3-Phosphate
(2)	Glyceraldehyde 3-phosphate	Phosphoenol Pyruvate	Lactic acid
(3)	Glyceraldehyde 3-phosphate	Lactic acid	Phosphoenol pyruvate
(4)	3-Phosphoglyceric acid	Acetyl CoA	CO ₂ + H ₂ O

133. The organism used by Engelmann to prepare action spectrum was

- (1) *Chlamydomonas* (2) *Chlorella*
 (3) *Cladophora* (4) *Hydrilla*

134. Wavelength of PAR (photosynthetically active radiation) varies from

- (1) 40 – 70 nm (2) 400 – 700 nm
 (3) 400 – 700 Å (4) 40 – 70 Å

135. Photosystem is composed of

- (1) Reaction centre
 (2) Light harvesting complex
 (3) Both (1) & (2)
 (4) Granum

SECTION-B

(ATTEMPT ANY 10 QUESTIONS)

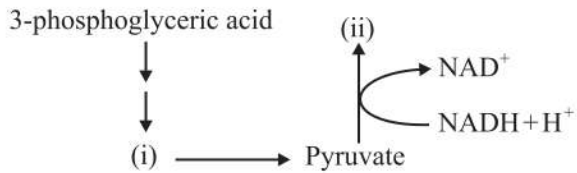
136. Choose correct option w.r.t. anaerobic respiration

- (1) The first oxidation step occurs in mitochondria
 (2) All reactions occur in the cytoplasm
 (3) They require oxygen only at one step
 (4) First step of reaction occur in cytoplasm then in mitochondria

137. What is the net gain in a Krebs cycle?

- (1) 1 FADH₂, 2 NADH₂ and 1 ATP
- (2) 2 FADH₂, 2 NADH₂ and 2 ATP
- (3) 1 FADH₂, 3 NADH₂ and 1 ATP
- (4) 1 FADH₂, 6 NADH₂ and 2 ATP

138. Identify the product marked by (i) & (iii) in the following pathway



- (1) (i) 2-phosphoglycerate; (ii) Acetyl CoA
- (2) (i) Phosphoenol pyruvate; (ii) Ethyl alcohol
- (3) (i) Phosphoenol pyruvate; (ii) Lactic acid
- (4) (i) Phosphoenol pyruvate; (ii) Acetyl CoA

139. Arrange the following respiratory substrates in the descending order of their R.Q. values

- | | |
|--|------------------|
| A. C ₆ H ₁₂ O ₆ | B. Oxalic acid |
| C. Albumin | D. Palmitic acid |
- (1) B, A, C & D
 - (2) A, B, C & D
 - (3) C, D, A & B
 - (4) B, D, C & A

140. Mobile electron carrier in ETS in mitochondrial membrane is

- (1) Complex I
- (2) Cyt c
- (3) Cyt a – a₃
- (4) Cyt bc₁

141. A phytohormone which was first isolated from a fungus

- (1) Is basic in nature
- (2) Helps in seed germination
- (3) Decreases sugarcane yield
- (4) Is used to promote fruit ripening

142. Identify the **incorrectly** matched pair.

(1)	Auxin	–	Phototropism
(2)	Gibberellins	–	Foolish seedling disease of rice
(3)	Ethylene	–	Induces fruit ripening
(4)	Cytokinins	–	Promote apical dominance

143. Leaf 'A' of initial size 10 cm² grows 5 cm² per year and leaf 'B' of 25 cm² grows 5 cm² per year. The relative growth rates of leaf A & B respectively are

- (1) 50% and 25%
- (2) 50% and 20%
- (3) 10% and 20%
- (4) 20% and 25%

144. Light reaction produces assimilatory power in the form of

- (1) ADP, NADH₂
- (2) ATP, NADPH + H⁺
- (3) NAD⁺
- (4) NADP⁺

145. Which of the following is incorrect about vernalization?

- (1) It prevents precocious reproductive development
- (2) It is observed in winter variety of wheat
- (3) Flowering is stimulated by low temperature
- (4) It is the resting stage of seeds

146. During vernalization, the stimulus of low temperature is perceived by

- (1) Stem apex
- (2) Leaves
- (3) Roots
- (4) Bark

147. To reduce 1 CO₂ in C₃ cycle, assimilatory power needed is

- (1) 3ATP, 2NADPH₂
- (2) 2ATP, 3NADPH₂
- (3) 5ATP, 2NADPH₂
- (4) 6 ATP, 2NADPH₂

148. CO₂ acceptor and carboxylating enzyme in C₃ plants are respectively

- (1) PEP, PEPCO
- (2) RuBP, RUBISCO
- (3) OAA, RUBISCO
- (4) 3 PGA, RUBISCO

149. In a chloroplast the highest number of protons are found in

- (1) Antennae complex
- (2) Stroma
- (3) Lumen of thylakoids
- (4) Inter membrane space

150. The process which makes major difference between C₃ and C₄ plants is

- (1) Glycolysis
- (2) Calvin cycle
- (3) Photorespiration
- (4) Respiration

ZOOLOGY

SECTION - A

151. Which of the following is a structural polysaccharide?

- (1) Glycogen (2) Starch
(3) Inulin (4) Cellulose

152. Fats and oils are

- (1) Glycolipids (2) Triglycerides
(3) Phospholipids (4) Conjugated lipids

153. Which of the following is a primary metabolite?

- (1) Carotenoid (2) Glucose
(3) Morphine (4) Cellulose

154. Which of the following is a secondary metabolite as well as a drug?

- (1) Concanavalin A (2) Vinblastine
(3) Diterpenes (4) Ricin

155. Which of the following is not a salient feature of B-DNA?

- (1) One full turn of helical strand involves 10 base pairs
(2) Pitch of helix would be 34 Å
(3) Diameter of double helix would be 20 Å
(4) DNA with left handed coiling

156. Which of the following group of enzymes helps in catalysing a transfer of a group (other a pair of substrates?)

- (1) Oxidoreductases (2) Transferases
(3) Lyases (4) Isomerases

157. What would happen to V_{max} in presence of a competitive inhibitor?

- (1) Decreases
(2) Increases
(3) Remains the same
(4) First increases then decreases

158. The role of an enzyme in a reaction is to/as

- (1) Decrease activation energy
(2) Increase activation energy
(3) Inorganic catalyst
(4) None of these

159. Pentoses and hexoses are common

- (1) Oligosaccharides
(2) Disaccharides
(3) Monosaccharides
(4) Polysaccharides

160. Which of the following is present in acid insoluble fraction?

- (1) Glucose (2) Fructose
(3) Alanine (4) Lipid

161. Organic compounds that are lightly bound to apoenzyme is

- (1) Prosthetic group
(2) Apoenzyme
(3) Metal ions
(4) Co-enzymes

162. Match List-I with List-II

List-I		List-II	
(a) Protein		i. C-C double bonds	
(b) Unsaturated fatty acid		ii. Phosphodiester	
(c) Nucleic acid		iii. Glycosidic bonds	
(d) Polysaccharides		iv. Peptide bonds	

Choose the correct answer from the options given below.

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

163. Which statement is incorrect-

- (1) Hormones are not species specific
(2) Receptor for hormones are non specific
(3) Epinephrine is a amino-acid derivative hormone
(4) Growth factors are also secreted by several non-endocrine tissues

164. Which is not stimulated by Glucocorticoids-

- (1) Gluconeogenesis
(2) Proteolysis
(3) Erythropoiesis
(4) Lipogenesis

165. Hormone which increases Ca^{++} absorption from the digested food is-

- (1) TSH (2) PTH
(3) Cortisol (4) Thymosin

166. Which function is performed by Testosterone-

- (1) Stimulates RBC production
(2) Suppression of immune response
(3) Maintaining the cardio-vascular system
(4) increases hair growth in whole body

167. Choose steroid hormone from these-

- (1) Acetyl choline (2) Thyroxine
(3) Cortisol (4) GnRH

168. Thyroid follicles are made up of-

- (1) Cuboidal cells
(2) Columnar cells
(3) Squamous cells
(4) Connective tissues

169. If serum level of aldosterone increases than the normal, then it would causes:

- (1) Excretion of more Na^+ and less K^+ .
(2) Excretion of more K^+ and less Na^+ .
(3) Excretion of more Na^+ and less K^+ both.
(4) Excretion of less Na^+ and less K^+ .

170. Thyroxine is

- (1) $\text{T}_3 + \text{T}_4$
(2) Only T_3
(3) Only T_4
(4) $\text{T}_3 + \text{T}_4 + \text{Thyrocalcitonin}$

171. Injury localised to the hypothalamus would most likely disrupt

- (1) short-term memory
(2) co-ordination during locomotion
(3) executive functions, such as decision
(4) regulation of body temperature

172. Which is thin elastic membrane and remains present above the rows of the hair cells:

- (1) Reissner's membrane
(2) Tectorial membrane
(3) Basilar membrane
(4) Tympanic membrane

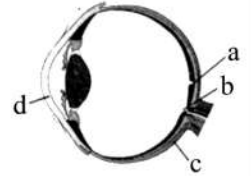
173. Unipolar neurons are:

- (1) neurons in which cell body does not have any process and these neurons are commonly present in retina of eye
(2) neurons in which cell body have only one axon and these are normally present in embryonic stage
(3) neurons in which cell body have only one axon and these are present in cerebral cortex throughout the life
(4) neurons in which either one axon or one dendrite is present and these are commonly present in embryonic stage

174. Which activity stimulates the movement of the synaptic vesicle towards the membrane

- (1) Influx of K^+ (2) Efflux of Ca^{++}
(3) Action potential (4) Efflux of Na^+

175. Identify a, b, c and d in the given diagram and choose incorrect statement:



- (1) (a) is fovea and this portion is the region of highest visual activity and have densely packed cone cells only
(2) (b) is blind spot and in this part no visual activity is present
(3) is sclera and this part contains pigments those prevents internal reflection
(4) is cornea and this part can absorb O_2 from the environment

176. Stapes is attached to the

- (1) Fenestra Rotandus
(2) Fenestra ovalis
(3) Sacculus ovalis
(4) Tympanum

177. Corpora quadrigemina is a part of

- (1) Fore brain (2) Mid brain
(3) Hind brain (4) Spinal cord

178. Photopigments are:

- (1) Light sensitive polysaccharides
(2) Light sensitive mucopolysaccharides
(3) Light sensitive cells
(4) Light sensitive proteins.

179. Efficiency of transmission of sound waves to the inner ear is increase by:

- (1) Ear pinna (2) External auditory canal
(3) Ear ossicles (4) Eustachian tube

180. Limbic system does not include:

- (1) Hypothalamus
(2) Amygdala
(3) Hippocampus lobe
(4) Epithalamus

181. Cerebral aqueduct passes through:

- (1) Fore brain (2) Mid brain
(3) Hind brain (4) Spinal cord.

182. Otolith organ is present in

- (1) Utricular, Saccule and semicircular canals
(2) Utriculus and semi-circular canals
(3) Only semi circular canals
(4) Utriculus and Saccule

183. Out of these which hormone does not shows hyperglycemia

- (1) Cortisol (2) Glucagon
(3) Growth hormone (4) Aldosterone

184. Cushing syndrome occurs due to the
- (1) decreased concentration of cortisol
 - (2) increased concentration of cortisol
 - (3) increased level of adrenaline
 - (4) increased concentration of minerlocorticoides

185. Inulin is a polymer of
- (1) Fructose
 - (2) Glucose
 - (3) Mannose
 - (4) Ribose

SECTION - B
(ATTEMPT ANY 10 QUESTIONS)

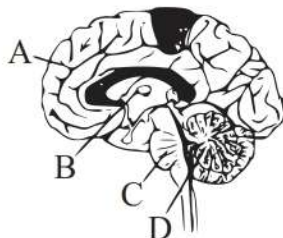
186. Reissner's membrane separates
- (1) Scala vestibuli and Scala media
 - (2) Tympanic cavity and Pharynx
 - (3) Fenestra rotundus and Fenestra ovalis
 - (4) Scala media and Scala tympani

187. On hydrolysis, a nucleoside would not yield
- (1) Purines
 - (2) Pyrimidine
 - (3) Pentose sugar
 - (4) Phosphoric acid

188. Deaf-mutism occurs due to the-
- (1) Hyposecretion of GH
 - (2) Hyposecretion of Thyroid
 - (3) Hyposecretion of PTH
 - (4) Hyposecretion of Adrenal cortex

189. Read the following statements and choose correct statement
- (1) Growth factors are also secreted by non-endocrine tissues
 - (2) Erythropoietin is a steroid hormone which stimulates erythropoiesis
 - (3) Large amount of androgenic steroids are also produced by adrenal cortex which play a role in gametogenesis
 - (4) Glucagon increases cellular uptake and utilization of glucose

190. A sagittal section of human brain is shown here. Identify at least two labels from A-D.



- (1) C-Cerebrum, D-Cerebellum
- (2) A-Cerebrum, C-Pons
- (3) B-Corpus callosum, D-Medulla
- (4) A-Cerebral hemispheres, B-Cerebellum

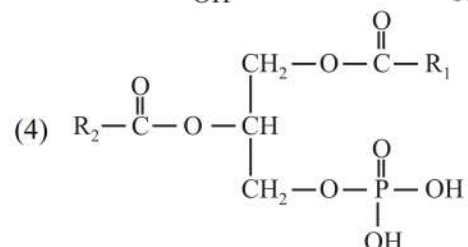
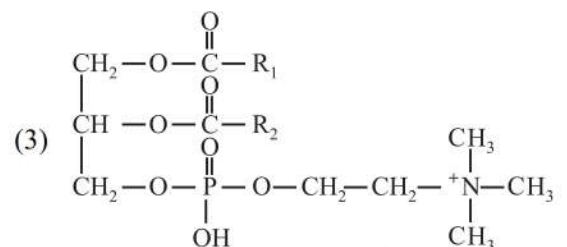
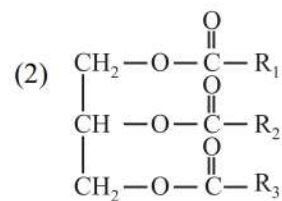
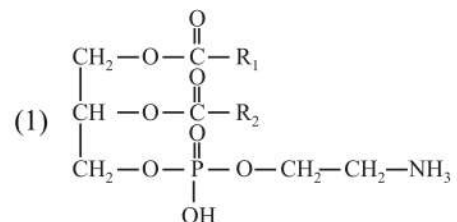
191. Non-protein part of enzyme is known as
- (1) Apoenzyme
 - (2) Colactor
 - (3) Inorganic catatyst
 - (4) Active site

192. Cochlea remains filled with
- (1) Endolymph
 - (2) Perilymph
 - (3) Lymph
 - (4) Wax and Endolymph

193. The afferent neuron receives signal from a sensory organ and transmit the impulse via a A into the B
- (1) A-Vertral nerve root, B-CNS
 - (2) A-Dorsal nerve root, B-CNS
 - (3) A-Dorsal nerve root, B-PNS
 - (4) A-ventral nereve root, B-PNS

194. Lactose is composed of
- (1) Glucose + galactose
 - (2) Fructose + galactose
 - (3) Glucose + fructose
 - (4) Glucose + glucose

195. Which of the following is the diagrammatic representation of phospholipid lecithin?



196. Which one is common for pancreas and gall bladder:

- (1) GIP
- (2) Gastrin
- (3) Cholecystokinin
- (4) Enterogastrone

197. Second messengers are triggered as a response of:

- (1) Steroid hormone
- (2) Anabolic steroids
- (3) Peptide hormones
- (4) All of these

198. Glycogenesis refers to

- (1) conversion of glycogen to glucose
- (2) breakdown of glucose to form pyruvate
- (3) Breakdown of pyruvate to form glucose
- (4) conversion of glucose to glycogen

199. During the transmission of nerve impulse through a nerve fibre, the potential on the inner side of the plasma membrane has which type of electric charge?

- (1) First positive, then negative and continue to be negative
- (2) First negative, then positive and continue to be positive
- (3) First positive, then negative and again back to positive
- (4) First negative, then positive and again back to negative

200. Transition state structure of the substrate formed during an enzymatic reaction is

- (1) Transient but stable
- (2) Permanent but unstable
- (3) Transient but unstable
- (4) Permanent and stable

ANSWERS

Section-A

1. (1)
2. (1)
3. (3)
4. (4)
5. (2)
6. (2)
7. (1)
8. (3)
9. (1)
10. (1)
11. (4)
12. (2)
13. (2)
14. (2)
15. (4)
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17. (4)
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24. (2)
25. (3)

26. (4)
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28. (1)
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30. (1)
31. (1)
32. (1)
33. (4)
34. (4)
35. (4)

Section-B

36. (3)
37. (1)
38. (3)
39. (1)
40. (1)
41. (2)
42. (2)
43. (2)
44. (3)
45. (1)
46. (2)
47. (2)
48. (4)
49. (1)
50. (2)

CHEMISTRY

ANSWERS

Section-A

- 51. (3)
- 52. (3)
- 53. (1)
- 54. (1)
- 55. (3)
- 56. (2)
- 57. (4)
- 58. (2)
- 59. (3)
- 60. (4)
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- 74. (4)
- 75. (4)
- 76. (1)

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- 78. (4)
- 79. (1)
- 80. (2)
- 81. (3)
- 82. (3)
- 83. (1)
- 84. (4)
- 85. (2)

Section-B

- 86. (1)
- 87. (2)
- 88. (3)
- 89. (2)
- 90. (2)
- 91. (2)
- 92. (4)
- 93. (4)
- 94. (3)
- 95. (3)
- 96. (4)
- 97. (1)
- 98. (3)
- 99. (3)
- 100. (4)

BOTANY

ANSWERS

Section-A

- 101. (2)
- 102. (1)
- 103. (3)
- 104. (2)
- 105. (3)
- 106. (3)
- 107. (2)
- 108. (1)
- 109. (1)
- 110. (4)
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- 112. (4)
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- 130. (3)
- 131. (1)
- 132. (2)
- 133. (3)
- 134. (2)
- 135. (3)

Section-B

- 136. (2)
- 137. (3)
- 138. (3)
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- 141. (2)
- 142. (4)
- 143. (2)
- 144. (2)
- 145. (4)
- 146. (1)
- 147. (1)
- 148. (2)
- 149. (3)
- 150. (3)

ZOOLOGY

ANSWERS

Section-A

- 151. (4)
- 152. (2)
- 153. (2)
- 154. (2)
- 155. (4)
- 156. (2)
- 157. (3)
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- 182. (4)
- 183. (4)
- 184. (2)
- 185. (1)

Section-B

- 186. (1)
- 187. (4)
- 188. (2)
- 189. (1)
- 190. (2)
- 191. (2)
- 192. (1)
- 193. (2)
- 194. (1)
- 195. (3)
- 196. (3)
- 197. (3)
- 198. (4)
- 199. (4)
- 200. (3)