ALLEN CAREER INSTITUTE KOTA (RAJASTHAN)

Path to Success

PAPER CODE	0	1	D	M	3	1	4	0	0	9
FORM NUMBER										

DISTANCE LEARNING PROGRAMME

(ACADEMIC SESSION 2014-2015)

LEADER TEST SERIES COURSE

TARGET : MH-CET 2015

TEST # 09	DATE : 19 - 04 - 2015
Test Type : MAJOR	Test Pattern : MH-CET

TEST SYLLABUS : FULL SYLLABUS

INSTRUCTIONS **Duration : 3:00 hours** **Total Marks : 200**

1. This question booklet contains 200 MCQs in the subjects of Physics (50), Chemistry (50) and Biology (100).
2. The question paper and OMR (Optical Mark Reader) Answer Sheet is issued separately at the start of the examination.
3. Choice and sequence for attempting questions will be as per the convenience of the candidate.
4. Candidate should carefully read the instructions printed on the Question Booklet and Answer Sheet and make the correct entries on the Answer Sheet. As Answer Sheets are designed to suit the OPTICAL MARK READER (OMR) SYSTEM, special care should be taken to mark the entries correctly. Special care should be taken to fill accurately. The correctness of entries has to be cross-checked by the invigilators. **Paper code and Form No.**
5. Read each question carefully.
6. Select the correct answer from the four available options given for each question.
7. Mark the appropriate circle completely like this ●, for answering a particular question. Mark with Black ink ball point pen only.
8. Each MCQ will have four options with single best response type. Correct response shall be **awarded one (1) mark.** There shall be no negative marking.
9. **Use of whitener or any other material to erase/hide the circle once filled is not permitted.**
10. Avoid overwriting and/or striking of answers once marked.
11. Rough work should be done only on the blank space provided on the Question Booklet. **Rough work should not be done on the Answer Sheet.**
12. The required Log-Antilog table will be provided along with the Question Booklet.
13. Immediately after the prescribed examination time is over, the Answer sheet is to be returned to the Invigilator.
14. No candidate is allowed to leave the examination hall till the end of examination.
15. No marks will be deducted if a particular question is not attempted.

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

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BEWARE OF NEGATIVE MARKING

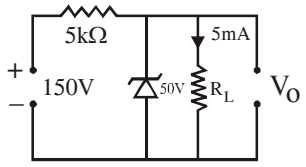
1. What is zener current in the following circuit?

(1) 10 mA

(2) 15mA

(3) 20 mA

(4) 25 mA



2. Indicate the wrong statement from the following: Modulation is used to

(1) allow the use of practicable antenna

(2) ensure that the information is transmitted over long distances

(3) increase the bandwidth

(4) decrease the bandwidth

3. A particle of mass m and charge Q is placed in an electric field E which varies with time t as $E = E_0 \sin \omega t$.

(1) The particle executes simple harmonic motion about a position which backward in direction of electric field with uniform velocity.

(2) The particle executes simple harmonic motion about a position which advances in direction of electric field with uniform acceleration.

(3) Maximum speed attained by the charge particle is $\frac{2QE_0}{m\omega}$

(4) Amplitude of the simple harmonic motion is $\frac{QE_o}{m^2\omega^2}$.

4. In a double slit experiment, the slits are separated by a distance d and the screen is at a distance D from the slits. If a maximum is formed just opposite to each slit, then what is the order of the fringe so formed?

(1) $\frac{d^2}{2\lambda D}$ (2) $\frac{2d^2}{\lambda D}$ (3) $\frac{d^2}{\lambda D}$ (4) $\frac{d^2}{4\lambda D}$

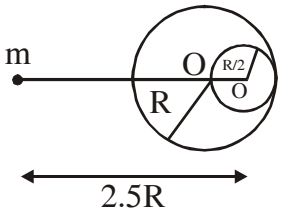
5. A solid sphere of radius R/2 is cut out of a solid sphere of radius R such that the spherical cavity so formed touches the surface on one side and the centre of the sphere on the other side (see figure). The initial mass of the solid sphere was M. If a particle of mass m is placed at a distance 2.5 R form the centre of the cavity, then what is the gravitational attraction on the mass m?

(1) $\frac{GMm}{R^2}$

(2) $\frac{GMm}{4R^2}$

(3) $\frac{GMm}{8R^2}$

(4) $\frac{23}{100}\frac{GMm}{R^2}$

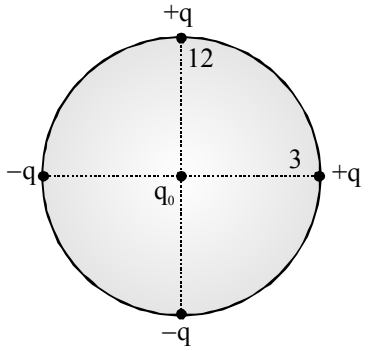


6. When one of the slits in Young's experiment is covered with a transparent sheet of thickness 3.6×10^{-3}cm, the central fringe shifts to a position originally occupied by the 30th bright frings. If $\lambda = 6000\ A^0$, find the refractive index of the sheet.

(1) 1.2 (2) 2 (3) 1.8 (4) 1.5

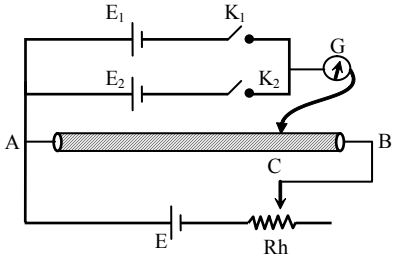
SPACE FOR ROUGH WORK

7. Four charges are placed at the circumference of a dial clock as shown in figure. If the clock has only hour hand, then the resultant force on a charge q_0 placed at the centre, points in the direction which shows the time as



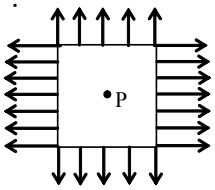
(1) 1:30 (2) 7:30 (3) 4:30 (4) 10:30

8. Figure shows the potentiometer arrangement to compare the emf of cells E_1 and E_2. Length of the resistance wire AB is 100 cm. If null point obtained for E_1 and E_2 are at distance 20 cm and 40 cm respectively from B then E_1/E_2 is -



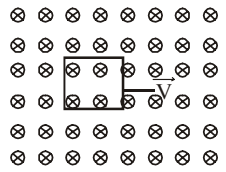
(1) 1 : 2 (2) 4 : 5
(3) 3 : 2 (4) 4 : 3

9. Electric lines of force are as shown in the figure. Then potential at point P :



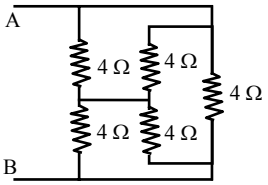
(1) is zero
(2) is not zero
(3) may be zero also
(4) is not defined

10. A conducting square loop of side L and resistance R moves in its plane with a uniform velocity v perpendicular to one of its sides. A magnetic induction B, constant in time and space, pointing perpendicular and into the plane of the loop exists everywhere.



The current induced in the loop is:
(1) BLv/R clockwise
(2) BLv/R anticlockwise
(3) 2BLv/R anticlockwise
(4) zero

11. Equivalent resistance between the points A and B is –



(1) 1Ω (2) 2Ω (3) 3Ω (4) 4Ω

12. An α-particle accelerated through V volts is fired towards a nucleus. Its distance of closest approach is r. If a proton accelerated through the same potential is fired towards the same nucleus, the distance of closest approach of the proton will be

(1) r (2) 2r (3) r/2 (4) r/4

13. A sample of radioactive material has mass m, decay constant λ, and molecular weight M. Avogadro constant = N_A. The initial activity of the sample is

(1) λm (2) $\frac{\lambda m}{M}$ (3) $\frac{\lambda m N_A}{M}$ (4) $mN_A e^{\lambda}$

SPACE FOR ROUGH WORK

14. A charged particle is moving in a uniform magnetic field in a circular path. The kinetic energy of the particle is tripled. If the initial radius of the circular path was R, the radius of the new circular path after the energy is tripled will be

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

15. Two diametrically opposite points of a metal ring are connected to two terminals of the left gap of meter bridge. In the right gap, resistance of 15Ω is introduced. If the null point is obtained at a distance of 40cm from the left end, find the resistance of the wire bent in the shape of the ring.

(1) 30Ω (2) 10Ω (3) 40Ω (4) 15Ω

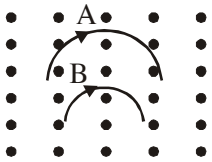
16. Two particles A and B of masses m_A and m_B respectively and having the same charge are moving in a plane. A uniform magnetic field exists perpendicular to this plane. The speed of the particles are v_A and v_B respectively and the trajectories are as shown in the figure. Then

(1) $m_A v_A < m_B v_B$

(2) $m_A v_A > m_B v_B$

(3) $m_A < m_B$ and $v_A < v_B$

(4) $m_A = m_B$ and $v_A = v_B$

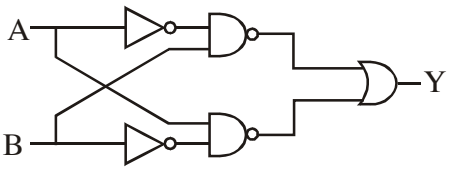


17. A radioactive nucleus (initial mass number A and atomic number z) emits 3 α-particles and 2 positrons. The ratio of number of neutrons to that of protons in the final nucleus will be

(1) $\frac{A-Z-4}{Z-2}$ (2) $\frac{A-Z-8}{Z-4}$

(3) $\frac{A-Z-4}{Z-8}$ (4) $\frac{A-Z-12}{Z-4}$

18. Given logic circuit behaves as



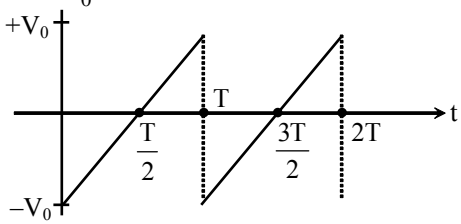
(1) OR gate (2) NOT gate

(3) AND gate (4) None of these

19. A thin circular disk of radius R is uniformly charged with density $\sigma > 0$ per unit area. The disk rotates about its axis with a uniform angular speed ω. The magnetic moment of the disk is

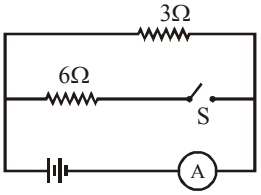
(1) $\pi R^4 \sigma\omega$ (2) $\frac{\pi R^4}{2}\sigma\omega$ (3) $\frac{\pi R^4}{4}\sigma\omega$ (4) $2\pi R^4\sigma\omega$

20. Rms value of the saw-tooth voltage of peak value V_0 as shown in -



(1) $\frac{V_0}{2}$ (2) $\frac{V_0}{\sqrt{2}}$ (3) $\frac{V_0}{3}$ (4) $\frac{V_0}{\sqrt{3}}$

21. In the circuit shown, the resistances of the ammeter A and the battery are zero. Ammeter reads 0.2 A when the switch S is open. When the switch S is closed, the ammeter will read



(1) 0.1 A (2) 0.2 A (3) 0.3 A (4) 0.6 A

SPACE FOR ROUGH WORK

22. The ratio of the coulomb to the gravitational force between two electrons is of the order of

(1) 10^{55} (2) 10^{42}

(3) 10^{28} (4) 10^{12}

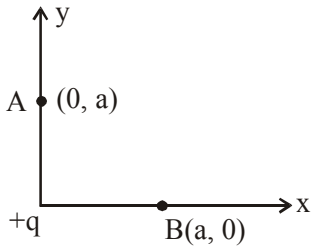
23. Work done in moving a charge Q from the point B (x = a, y = 0) to the point A (x = 0, y = a) in the field of charge +q at origin is

(1) zero

(2) $\frac{qQ}{4\pi\in_0(\sqrt{2}a)}$

(3) $\frac{qQ}{4\pi\in_0(2a)}$

(4) $\frac{Qq\sqrt{2}a}{4\pi\in_0}$



24. Two coherent light sources emit light of the

(1) same intensity

(2) same pitch

(3) constant but different wavelengths

(4) same frequency having constant phase difference

25. A particle of mass m is moving in a circular path of constant radius r such that its centripetal acceleration a_c is varying with time as $a_c = k^2rt^2$, where k is a constant. The power delivered to the particle by the forces acting on its is

(1) $2\pi mk^2r^2t$ (2) mk^2r^2t

(3) $\frac{1}{3}mk^4r^2t^5$ (4) 0

26. Lenz's law is based on the conservation of :-

(1) Energy (2) Mass

(3) Charge (4) Momentum

27. The value of mutual inductance is 1.5H for primary and secondary coils. If current in primary coil is increased from zero to 20 A in 0.5 sec. Then value of change in flux (in Wb) associated with secondary coil will be :-

(1) 10 (2) 25 (3) 30 (4) 40

28. Two electrons are moving in parallel direction with same speed v. Then ratio of electric force to magnetic force produced by them is :-

(1) $\frac{c^2}{v^2}$ (2) $\frac{v^2}{c^2}$

(3) $\frac{c}{v}$ (4) $\frac{v}{c}$

29. Is magnetic permeability of ferromagnetic materials affect with external magnetic field :-

(1) Yes (2) No

(3) Partially (4) Can't say

30. An electron is moving from west to east direction. There is an electric field directed from north to south. In which direction magnetic field should apply so that electron moves undeflected ?

(1) Upward the plane of paper

(2) Inward the plane of paper

(3) East to west

(4) South to north

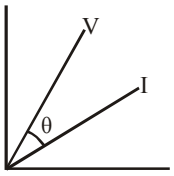
31. If $90° > \theta > 0°$ then correct relation will be-

(1) $X_L > X_C$

(2) $X_L < X_C$

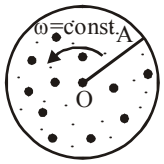
(3) $X_L = X_C$

(4) R = 0



SPACE FOR ROUGH WORK

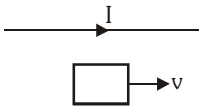
32. When a rod is rotating in a magnetic field as shown in figure then emf of 7μV is induced. If its length will be double and magnetic field will be half then the value of induced emf is :



(1) 14 μV
(2) 28 μV
(3) 7 μV
(4) 7/2 μV

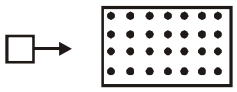
33. Which of the following is correct according to increasing order of frequency ?
(A) FM, AM, Cell Phone, Satellite
(B) FM, AM, Satellite, Cell Phone
(C) AM, FM, Cell Phone, Satellite
(D) AM, FM, Satellite, Cell Phone

34. A current I is flowing in a long current carring wire as shown in figure. A small loop wire is moving parallel near the wire with velocity v. The induced current in loop is-



(1) Proportional to velocity v
(2) Inversely proportional to velocity v
(3) Proportional to current I
(4) No current

35. What will be the direction and force on the metallic loop if it enters in uniform magnetic field :-



(1) Towards left all times
(2) Towards left while entering and towards right when it exit
(3) Towards right all the times
(4) Towards right while entering and towards left when it exit

36. Two planets of masses M_1 and M_2 are situated r distance apart. With what velocity should a mass m be projected from the mid point of the two planets so that it escapes away from the gravitational pull of both?

(1) $\sqrt{\frac{G(M_1+M_2)}{2}}$

(2) $2\sqrt{\frac{G(M_1+M_2)}{r}}$

(3) $\sqrt{\frac{G(M_1-M_2)}{r}}$

(4) $2\sqrt{\frac{G(M_1-M_2)}{r}}$

SPACE FOR ROUGH WORK

37. In YDSE distance between slit and screen is 1m. Fringe width is 6 mm. In single slit Fraunhafer diffraction experiment monochromatic light is used which has been used in previous experiment. In this experiment slit width is equal to the distance between both slits in YDSE. In this experiment find the angle to get very first minimum diffraction (in radian) :-

(1) 6×10^{-3} (2) 3×10^{-3}

(3) 6×10^{-4} (4) 6×10^{-2}

38. When Copper and Germanium wire is cooled at room temperature up to 80K, then resistance of-

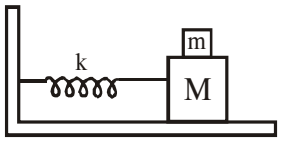
(1) Copper will decrease and Germanium, will increase

(2) Both will increase

(3) Both will decrease

(4) Copper will increase, Germanium will decrease

39. A mass M is attached to a horizontal spring of force constant k fixed on side to a rigid support as shown in the figure. the mass oscillates on a frictionless surface with time period T and amplitude A. When the mass is in equilibrium position, another mass m is gently placed on it and sticks to it. What will be the new amplitude of oscillations?



(1) $A\sqrt{\left(\frac{M}{M-m}\right)}$ (2) $A\sqrt{\left(\frac{M-m}{M}\right)}$

(3) $A\sqrt{\left(\frac{M}{M+m}\right)}$ (4) $A\sqrt{\left(\frac{M+m}{M}\right)}$

40. If resistance of each side of a cube is R then resultant resistance between two opposite points of its digonal.

(1) $\frac{5}{6}R$

(2) $\frac{8}{3}R$

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

(4) $\frac{2}{5}R$

41. Best method to reduce eddy currents is :-

(1) Laminating core

(2) Using thick wires

(3) Reducing hysteresis loss

(4) Using long wires

42. Electric field at a distance 'r' from infinitely long conducting sheet is proportional to :-

(1) r^{-1}

(2) r^{-2}

(3) $r^{-3/2}$

(4) Independent of r

43. In a given series LCR circuit R = 4Ω, X_L = 5Ω and X_C = 8 Ω, the current :-

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

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

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

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

SPACE FOR ROUGH WORK

44. Copper and steel wires of same length and same area of cross-section are joined end to end. The composite wire is suspended from a rigid support and the load is applied to its free end. If increase of length of composite wire is x then increase in length of copper wire is

(1) $2x$ (2) $\left(\frac{Y_{cu}}{Y_{steel}}+1\right)x$

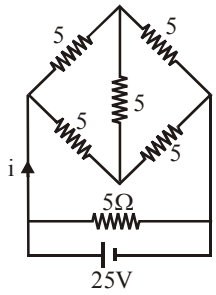
(3) $\frac{x}{\left(\frac{Y_{cu}}{Y_{steel}}+1\right)}$ (4) $\frac{\left(\frac{Y_{cu}}{Y_{steel}}+1\right)}{x}$

45. If n identical liquid drops are merged, then fractional loss in energy is _____

(1) $(n-1)^2$ (2) $(n-1)^{1/3}$

(3) $1-\left(\frac{1}{n}\right)^{1/3}$ (4) $1-\frac{1}{n^3}$

46. The value of current i for the given circuit is



(1) 10 A (2) 5 A (3) 2.5 A (4) 20 A

47. A proton travels few distance in an electric field, it then enters a crossed magnetic field of 1T. If radius of its path is 0.2m, find the velocity of proton:

(1) 0.2×10^8 m/s (2) 0.2×10^7 m/s

(3) 0.2×10^6 m/s (4) 2×10^7 m/s

48. A string has fundamental frequency n. Two wooden knife edge divide the string into three segments having fundamental frequencies of n_1, n_2 & n_3 under the same tension. Then,

(1) $n = n_1 + n_2 + n_3$

(2) $\sqrt{n} = \sqrt{n_1} + \sqrt{n_2} + \sqrt{n_3}$

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

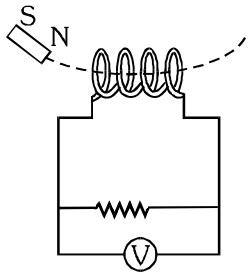
(4) $\frac{1}{n} = \frac{1}{n_1} + \frac{1}{n_2} + \frac{1}{n_3}$

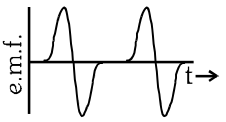
49. A cyclotron is used to accelerate charged particles. Then the time period under the influence of 1T magnetic field of a proton :

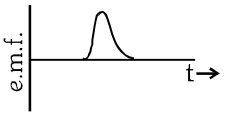
(1) 20π ns (2) 40π ns

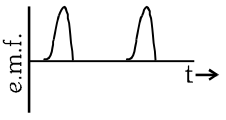
(3) 10π ns (4) 5π ns

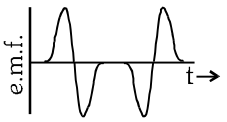
50. A magnet is made to oscillate with a particular frequency, passing through a coil as shown in figure. The time variation of the magnitude of e.m.f. generated across the coil during one cycle is :–



(1) 

(2) 

(3) 

(4) 

SPACE FOR ROUGH WORK

51. For the 1st order reaction,
$A(g) \longrightarrow 2B(g) + C(s)$, $t_{1/2} = 24$ minute. The reaction is carried out taking certain mass of A enclosed in a vessel having constant volume in which it exerts a pressure of 400 mm Hg. The pressure of the reaction mixture after expiry of 48 minute will be
(1) 700 mm Hg (2) 600 mm Hg
(3) 800 mm Hg (4) 1000 mm Hg

52. Given the following, thermo chemical reactions
$C(s) + O_2(g) \rightarrow CO_2(g)$; $\Delta H = -94.2$ kcal mol^{-1}

$H_2(g) + \frac{1}{2}O_2(g) \rightarrow H_2O(l)$; $\Delta H = -68.3$ kcal mol^{-1}

$CH_4(g) + 2O_2(g) \rightarrow CO_2(g) + 2H_2O(l)$; $\Delta H = -210.8$ kcal mol-1
The heat of formation of methane in kcal mol^{-1} will be
(1) –45.9 (2) –47.8
(3) –20.0 (4) –47.3

53. KCl crystallizes in the same type of lattice as NaCl; Given that $\frac{r_{Na^+}}{r_{Cl^-}} = 0\cdot6$ and $\frac{r_{Na^+}}{r_{K^+}} = 0\cdot9$.
What is the ratio of the side of the unit cell for KCl to that for NaCl?
(1) 1.04 (2) 2
(3) 5.01 (4) 2.5

54. By how much will the potential of half-cell $Cu|Cu^{2+}$ change if the solution is diluted to 100 times at 298 K?
(1) Increases by 59 mV
(2) Decreases by 59 mV
(3) Increases by 29.5 mV
(4) Decreases by 29.5 mV

55. Which of the following ions does not have S-S linkage?
(1) $S_2O_5^{2-}$ (2) $S_2O_6^{2-}$ (3) $S_2O_8^{2-}$ (4) $S_2O_3^{2-}$

56. In order to refine 'blister copper' it is melted in a furnance and is stirred with green logs of wood. The purpose is
(1) to increase the carbon content of copper
(2) to bring the impurities to surface and oxidize them.
(3) to reduce the metallic oxide impurities with hydrocarbon gases liberated from the wood.
(4) to expel the dissolved gases in blister copper.

57. Which of the following compounds is expected to exhibit optical isomerism? [en = ethylenediamine]
(1) cis-$[Co(en)_2Cl_2]$ (2) cis-$[Pt(NH_3)_2Cl_2]$
(3) trans-$[Co(en)_2Cl_2]$ (4) trans-$[Pt(NH_3)_2Cl_2]$

58. In zinc blende structure, the distance of closest approach between two anions is equal to
(1) half the edge length.
(2) half the face diagonal.
(3) $\frac{3}{4}$th of body diagonal.
(4) body diagonal.

59. Which one of the following statements is false?
(1) work is a state function.
(2) temperature is a state function.
(3) work appears at the boundary of the system.
(4) change in the state is completely defined when the initial and final states are specified.

60. A radioactive substance has 200 nuclei at a given time. The decay constant of the substance is $1sec^{-1}$. In what time will the number of radioactive nuclei become 100?
(1) 1 sec (2) 2 sec
(3) ln 2 sec (4) $\frac{1}{\ln 2}$ sec

SPACE FOR ROUGH WORK

61. Ammonium salt gives brown colour with alkaline solution of Nessler's reagent to form iodide of Millon's base. The formula of this compound is
(1) NH_2 - Hg - O - HgI
(2) NH_2 - O - Hg - HgI
(3) K_2HgI_4
(4) NH_2 - HgI

62. Which one of the following complex ions has the highest stability at 298 K?
(1) $[CdCl_4]^{2-}$
(2) $[CdBr_4]^{2-}$
(3) $[CdI_4]^{2-}$
(4) $[Cd(CN)_4]^{2-}$

63. To an acidified dichromate solution, a pinch of Na_2O_2 is added and shaken. What is observed?
(1) Blue colour
(2) Red colour changing to green
(3) Copious evolution of oxygen
(4) Bluish-green precipitate

64. The compound (X) on heating gives a colourless gas. The residue is dissolved in water to obtain (Y). Excess CO_2 is bubbled through aqueous solution of (Y), (Z) is formed. (Z) on gentle heating gives back (X). The compound (X) is.
(1) $CaCO_3$
(2) Na_2CO_3
(3) $CaSO_4.2H_2O$
(4) K_2CO_3

65. There are 6×10^{24} particles present in hcp lattice then how many number of THV will be present -
(1) 1.2×10^{25} (2) 1×10^{24}
(3) 2×10^{24} (4) 5×10^{24}

66. In aqueous solution, $[Co(H_2O)_6]^{2+}$ reacts with molecular oxygen in the presence of excess liquor NH_3 to give a new complex X. The number of unpaired electrons in $[Co(H_2O)_6]^{2+}$ & X are respectively -
(1) 3,1 (2) 3,0 (3) 3,3 (4) 7,0

67. Aqueous solution of a metallic nitrate X reacts with NH_4OH to form Y which dissolves in excess NH_4OH. The resulting complex is reduced by acetaldehyde to deposit the metal. X and Y, respectively are
(1) $CsNO_3$ & CsOH
(2) $Zn(NO_3)_2$ & ZnO
(3) $AgNO_3$ & Ag_2O
(4) $Mg(NO_3)_2$ & $Mg(OH)_2$

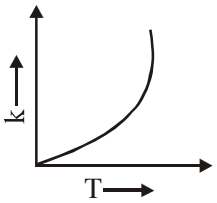
68. Total no. of possible isomer in $[Pt(NH_3)_2(NO_2)_2]$ is-
(1) 2 (2) 4 (3) 6 (4) 3

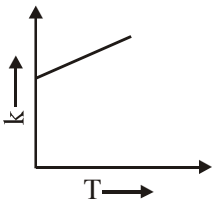
69. Extraction of metal from the ore cassiterite does not involve.
(1) Carbon reduction of an oxide ore
(2) Self reduction of a sulphide ore
(3) removal of copper impurity
(4) removal of iron impurity

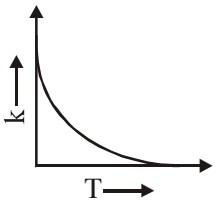
70. For first order reaction
$2N_2O_{5(g)} \longrightarrow 4NO_{2(g)} + O_{2(g)}$, which is incorrect statement?
(1) the concentration of reactant decreases exponentially with time
(2) the half life of the reaction decreases with increasing temperature
(3) the half life of the reaction depends on the initial concentration of reactant.
(4) the reaction proceeds to 99.6% completion in eight half-life duration.

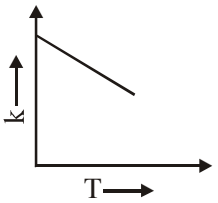
SPACE FOR ROUGH WORK

71. Plots showing the variation of the rate constant (k) with temperature T are given below. The plot that follows Arrhenius equation is_____

(1) 

(2) 

(3) 

(4) 

72. Incorrect match is -
(1) $[Fe(CN)_6]^{3-}$ - d^2sp^3, paramagnetic
(2) $Fe(CO)_5$ -sp^3d, diamagnetic
(3) $[Fe(en)_3]^{3+}$ - d^2sp^3, paramagnetic
(4) $[FeCl_2(PPh_3)_2]$ - sp^3, paramagnetic

73. In a constant volume calorimeter, 3.5 g of a gas with molecular weight 28 was burnt in excess oxygen at 298 K. The temperature of calorimeter was found to increase from 298 K to 298.45K due to combustion process. Given that heat capacity of calorimeter is 2.5 kJ K^{-1}, enthalpy of combustion of gas in kJ mol^{-1} is
(1) 8 (2) 9 (3) 4.5 (4) 10

74. The emf of cell $Zn|Zn^{+2}$ (0.01M) $||Fe^{+2}$ (0.001M) |Fe at 298K is 0.2905 then the value of equilibrium constant for the cell reaction is

(1) $(e)^{\frac{0.32}{0.0295}}$ (2) $(10)^{\frac{0.32}{0.0295}}$

(3) $(10)^{\frac{0.26}{0.0295}}$ (4) $(10)^{\frac{0.32}{0.0591}}$

75. Which of the following isomers of phosphorus is thermodynamically most stable?
(1) Red (2) White (3) Black (4) Yellow

76. One mole of monoatomic ideal gas expands adiabatically at initial temperature T against a constant external pressure of 1atm from 1 litre to 2 litre. Find out final temperature ?
(R = 0.0821 lit atm K^{-1} mol^{-1})

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

(3) $T-\frac{2}{3\times0.0821}$ (4) $T+\frac{2}{3\times0.0821}$

77. 0.2 molal acid HX is 20% ionized in solution K_f = 1.86 K $molal^{-1}$. The freezing point (in ^0C) of solution is -
(1) -0.45 ^0C
(2) -0.90 ^0C
(3) -0.31 ^0C
(4) -0.53 ^0C

78. 3g of activated charcoal was added to 50 mL of acetic acid solution (0.06N) in a flask. After an hour it was filtered and the strength of the filter was found to be 0.042 N. The amount of acetic acid adsorbed (per gram of charcoal) is -
(1) 36 mg (2) 42 mg
(3) 54 mg (4)18 mg

79. The relationship between osmotic pressure at 273K, when 10g glucose (P_1), 10g urea (P_2) and 10g sucrose (P_3) are dissolved in 250 mL of H_2O is
(1) $P_1 > P_2 > P_3$
(2) $P_3 > P_1 > P_2$
(3) $P_2 > P_1 > P_3$
(4) $P_2 > P_3 > P_1$

SPACE FOR ROUGH WORK

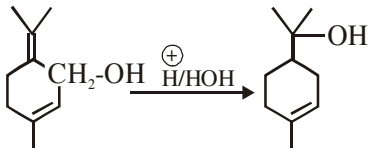
80. During extraction of iron, which of the following act as a flux
(1) Silica
(2) Calcium sulphate
(3) lime stone
(4) coke

81. Structure of [Pt $(NH_3 Cl_2)$] is :
(1) square planner
(2) Tetrahedral
(3) Pyramidal
(4) Pentagonal

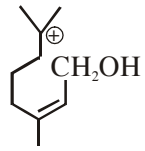
82. The thermal stability of the hydrides of group 15 follows the order.
(1) $NH_3 < PH_3 < AsH_3 < SbH_3 < BiH_3$
(2) $NH_3 > PH_3 > AsH_3 > SbH_3 > BiH_3$
(3) $PH_3 > NH_3 > AsH_3 > SbH_3 > BiH_3$
(4) $AsH_3 < PH_3 > SbH_3 > BiH_3 > NH_3$

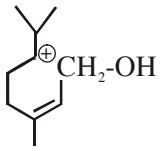
83. Concentrated H_2SO_4 displaces hydrogen chloride from chloride salts because
(1) It is stronger than HCl
(2) HCl is more volatile than H_2SO_4 so it is entropy supporting reaction.
(3) Sulphates are more soluble than chlorides.
(4) Sulphates are less soluble than chlorides

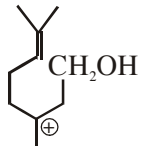
84. Geraniol is a naturally occuring alcohol found in pinus tree. In laboratory geraniol converts into α-terpineol in the presence of aqueous acid.

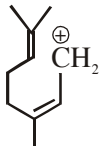


The first step of this reaction is the formation of carbocation. The structure of carbocation which gives the final product is

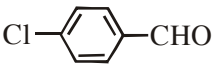
(1) 

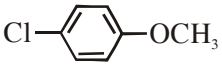
(2) 

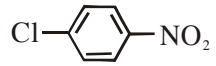
(3) 

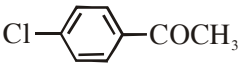
(4) 

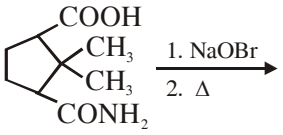
85. Which one of the following form benzyne as intermediate when treated with KNH_2 in liquid NH_3 :

(1) 

(2) 

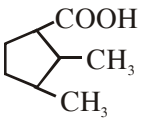
(3) 

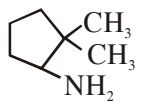
(4) 

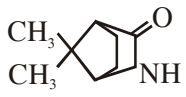
86. 

The final product of the reaction is :-

(1) 

(2) 

(3) 

(4) 

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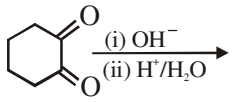
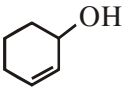
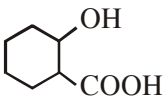
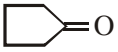
87. Predict the product in the following reaction



(1) 

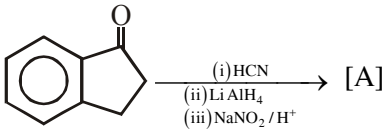
(2) 

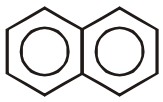
(3) 

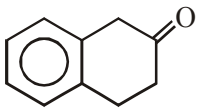
(4) 

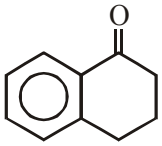
88. Buna-S- rubber is a polymer of
(1) 1,3-butadiene and styrene
(2) vinyl acetate
(3) Acrylonitrile
(4) None of these

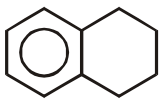
89. Product A of the reaction is :

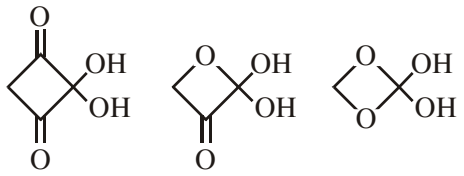


(1) 

(2) 

(3) 

(4) 

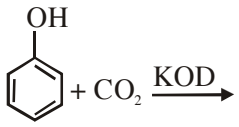
90. 

(I) (II) (III)

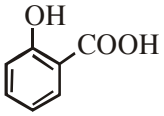
Ease of dehydration among these compounds will be in the order as :
(1) (I) > (II) > (III) (2) (III) > (II) > (I)
(3) (I) > (III) > (II) (4) (II) > (III) > (I)

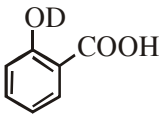
91. Which of the following does not respond to haloform reaction?
(1) $CH_3 - CH_2 - OH$
(2) CCl_3CHO
(3) $CH_3 - \overset{\overset{O}{\|}}{C} - CH_2 - COC_2H_5$
(4) $CH_3 - \underset{\underset{OH}{|}}{CH} - CH_3$

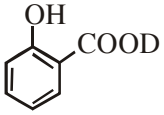
92. For the formation of glucosazone, how many phenylhydrazine molecules react with glucose?
(1) 2 (2) 3
(3) 4 (5) 1

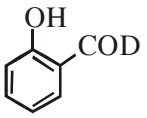
93. 

The major product in the above reaction is___

(1) 

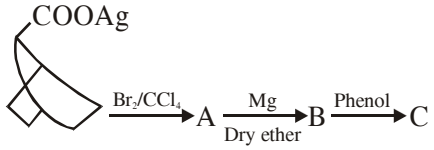
(2) 

(3) 

(4) 

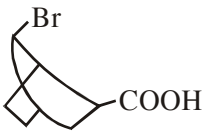
SPACE FOR ROUGH WORK

94.



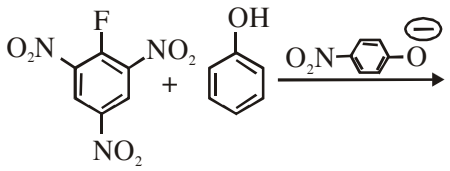
The final product 'C' in the above reaction is ____

(1) 

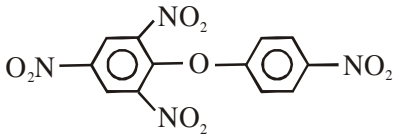
(2) 

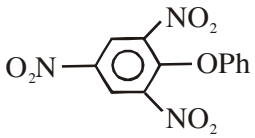
(3) 

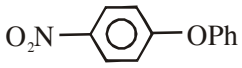
(4) 

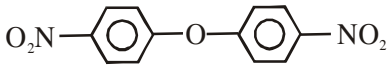
95. 

The main product in above reaction is _____

(1) 

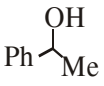
(2) 

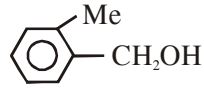
(3) 

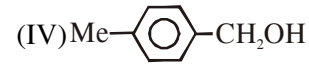
(4) 

96. The decreasing order of ester formation with benzoic acid in presence of H^+ is ____

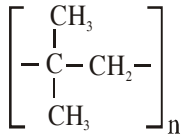
(I) 

(II) 

(III) 

(IV) 

(1) (I) > (II) > (III) > (IV)
(2) (I) > (II) > (IV) > (III)
(3) (IV) > (III) > (II) > (I)
(4) (III) > (IV) > (II) > (I)

97. Monomer of  is

(1) 2-methylpropene
(2) Ethene
(3) Propylene
(4) Styrene

98. Which of the following sets contains only copolymers?

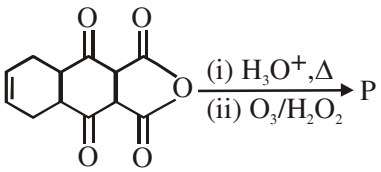
(1) SBR, Glyptal, Nylon-6,6
(2) Polyethene, polyester, PVC
(3) Nylon-6, Butyl rubber, Neoprene
(4) Melmac, Bakelite, Teflon

99. Which statement is correct about the reaction?

Aldohexose(A) $\xrightarrow[Ac_2O/NaOAc]{\text{Excess of}}$ products (B) $\xrightarrow{PhNHNH_2}$ products (C)

(1) products (B) are α & β-penta acetates
(2) products (B) are α & β-tetra acetates
(3) products (C) are phenyl hydrazone of products (B).
(4) products (B) react with $PhNHNH_2$

100. The total number of carboxylic acid groups in the product 'P' is -



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

SPACE FOR ROUGH WORK

101. Which of the following terms represents a pair of contrasting factors of a character in homologous condition?
(1) Genes (2) Heterozygous
(3) Allele (4) Homozygous

102. 'Gametes can never be hybrid', this statement is related to
(1) law of dominance
(2) law of fertilization
(3) law of segregation
(4) law of independent assortment

103. If a mother is of O blood group and father has AB blood group, which of the following cannot be the blood group of their daughter?
(1) O, AB (2) A
(3) B (4) AB only

104. How many types of zygotic combinations are possible between a cross AaBBCcDD × aaBBccDd?
(1) 128 (2) 16 (3) 64 (4) 8

105. In ____, _____ origin of replication is present and the replication is known as θ replication.
(1) *Plasmodium*, two
(2) *Ascaris*, one
(3) E.*coli*, one
(4) *Entamoeba*, two

106. Read the following statements and choose the CORRECT option -
a. DNA is negatively charged and is wrapped around positively charged histone octamer and only this forms chromatin.
b. Core DNA consists of 244 bp.
c. Solenoid fibre is of 300 Å diametre.
d. Euchromatin stains dark.
(1) a, b are incorrect while c, d are correct
(2) only c is correct
(3) a, b are correct while c, d are incorrect
(4) a, b, d are correct while c is incorrect

107. Term cryptogram can use to refer to :-
(1) Study of chromosome number
(2) Genetic code
(3) Study of chromosome disorder
(4) Study of euchromatin

108. Choose the CORRECT option.

	Features	m-RNA	r-RNA	t-RNA
1.	Function	Carries coded information	Carries amino acid during protein synthesis	Translation code message in terms of amino acids
2.	Structure	Double stranded	Single stranded	Double stranded
3.	Molecular weight	40,000 - 1,00,000	Upto 5,00,000	23,000 - 30,000
4.	Percentage of total cellular RNA	3 - 5 %	80%	10 - 20 %

109. Which of the following is INCORRECT w.r.t. the characteristics of genetic code?
(1) GUG is ambiguous in nature
(2) Stop codon 'UAG' is Amber
(3) Valine is coded by four codes as GUU, GUC, GUG and AUA
(4) 61 codons out of 64 codons are sense codons

110. Match the following -

	Column - I		Column - II
a.	Beadle & Tatum	p.	Biochemical nature of transforming principle
b.	Herschey & Chase	q.	*Diplococcus pneumonia*, 1928
c.	F. Griffith	r.	T_2 bacteriophage, 1952
d.	Avery, McLeod and McCarty	s.	*Neurospora crassa*, 1941

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

SPACE FOR ROUGH WORK

111. Select the INCORRECT one w.r.t. lac operon.
(1) In E.*coli*, 250 genes are grouped in 75 different operons.
(2) 'z' gene codes for β–galactosidase, 'y' codes for permease and 'a' codes for transacetylase
(3) Structural genes code for proteins.
(4) Operators are present between the promoters and structural genes.

112. Basic steps involved in r-DNA process are enlisted below. Put them in the CORRECT order.
a. Cultivating cells to obtain multiple copies or clone of desired fragments of DNA
b. Screening the fragments for a desired gene
c. Fragmenting DNA using molecular scissors
d. Isolating genomic DNA of a donor
e. Using copies to transform suitable host cells so as to express desired genes
f. Inserting fragments with desired gene into cloning vector, so as to develop rDNA
g. Introducing recombinant vector into competent cells
(1) d → c → b → f → g → a → e
(2) d → c → b → g → f → a → e
(3) d → c → g → b → f → a → e
(4) d → c → f → b → g → a → e

113. Choose the CORRECT statement -
(1) DNA of λ phage is 48.5 mb in length
(2) pBR322 has cos sites of 12 bp at ends
(3) *Eco*R I was the first endonuclease to be discovered
(4) c-DNA is produced using t RNA by the process called reverse transcriptase

114. Choose the INCORRECT statement -
a. PCR was developed by Kary Mullis in 1983
b. dATP, dCTP, dGTP & dTTP are collectively called NTPs.
c. Thermostable DNA polymerase can withstand temperature upto 94^0 C.
d. Taq polymerase adds dNTPs without primer on ss DNA.
(1) b & c only (2) a, b & c only
(3) d only (4) a, c & d only

115. Fill in the blanks by choosing the CORRECT option-
a. A is granted by the government to inventor for biological entitites, processes and products
b. B gene from *Bacillus thuringiensis* or C gene from *Rhizobium* is cloned inside *Agrobacterium tumefaciens* and then transferred into other plant.
c. Flavr savr tomato was developed by introducing an additional copy of polygalactouronase encoding gene in D orientation.
(1) A - Biopiracy, B - cry, C - Nif, D - antisense
(2) A - biopatent, B - Cry, C - Nif, D - antisense
(3) A - biopiracy, B - cry, C - operator, D - sense
(4) A - Biopatent, B - Nif, C - operator, D - antisense

116. Identify the vector from the following features -
a. They do not involve RNA intermediate
b. Enzyme transposase makes a staggered cut at target site producing sticky ends.
c. This enzyme cuts the vector and ligates in new position.
(1) Retrotransposons (2) DNA transposons
(3) Cosmids (4) Plasmids

117. How many of the following statements are CORRECT?
a. Wheat production increased from 11 million tonnes to 89.5 million tonnes during 1960 to 2000.
b. Semi-dwarf varieties of rice 'Sonalika' & 'Kalyansona' were high yielding and disease resistant.
c. Himgiri is Hill bunt, leaf and stripe rust resistant variety of wheat.
d. Hybrid maize has 5 times the quantity of lysine and tryptophan amino acids.
(1) 3 (2) 1 (3) 2 (4) 4

SPACE FOR ROUGH WORK

118. Match the following crops with their biofortification nutrient.

CROPS	FORTIFIED WITH
a. Bitter gourd	p. High vitamin C
b. Atlas 66	q. High vitamin A
c. Pumpkin	r. High iron
d. Rice	s. High protein

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

119. Match the following

Column - I	Column - II
a. IRRI	p. Knop's salt solution
b. IARI	q. Anthocyanin
c. Haberlandt	r. Vinblastin
d. *Daucus carota*	s. Protein enriched beans
	t. IR-8

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

120. Choose the INCORRECT option -
(1) *Datura* - Secondary metabolite 'Tropane'
(2) SCP - only from unicellular microorganisms
(3) Apical meristem - virus free plants
(4) Fusogenic agent - PEG

121. Which one of the following statements is TRUE?
(1) Robert Hill used chloroplasts of *Chlorella* in water which was without CO_2.
(2) Robert Hill used water with CO_2 & chloroplast of *Chlorella.*
(3) In Hill's experiment, ferrous salts are converted to ferric salts.
(4) Ruben & Kamen proved that oxygen released during photosynthesis comes from water.

122. Light energy on interaction with matter behaves as a stream of discrete packetes of energy known as photons. The theory is -
(1) Wave theory (2) Dual nature theory
(3) Corpuscular theory (4) Light theory

123. Which one of the following is ODD w.r.t PS II ?
(1) Mn (2) Ca (3) Cl (4) Mo

124. Identify the INCORRECT difference/s between C_4 pathway and CAM pathway.

C_4 pathway	CAM pathway
a. Kranz anatomy is present	Kranz anatomy is absent
b. Maize, sugarcane and *Kalanchoe* are C_4 plant	Jowar is a CAM plant
c. C_4 pathway had evolved in arid plants	CAM pathway occurs in succulents along with xerophytic plants
d. CO_2 fixation occurs twice, 1st during day & next during night	CO_2 fixation occurs once during night

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

125. Which of the following statement is TRUE?
(1) In bacteria, pyruvate is converted to lactic acid by decarboxylation.
(2) 1 ATP is used during the conversion of fructose-6-phosphate to fructose-1, 6-diphosphate.
(3) Very less energy is generated during anaerobic respiration in mitochondrion of living cells.
(4) Substrate level phosphorylation occurs at oxysomes.

SPACE FOR ROUGH WORK

126. ATP is utlised in which of the following steps of glycolysis?
(1) PEPA → Pyruvate
(2) Fructose-1,6-diphosphate → 3PGAL
(3) 3PGA → 2PGA
(4) Glucose → Glucose-6-phosphate

127. Which of the following step involves Mg^{++} as co factor and dehydration?
(1) DHAP → 3 PGAL
(2) Glucose + ATP → Glucose 6 Phosphate
(3) 2 PGA → PEPA
(4) 1, 3 di PGA → 3PGA

128. Number of ATPs produced from 1 glucose in Kreb's cycle via substrate level phosphorylation is
(1) 34 (2) 2
(3) 4 (4) 36

129. TPP is used in -
(1) CH_3- CHO + $NADH_2$ → C_2H_5OH + NAD
(2) $C_{12}H_{22}O_{11} + H_2O \rightarrow C_6H_{12}O_6$
(3) $C_6H_{12}O_6$ + 2 NAD + ADP → CH_3- COOH
(4) $CH_3COCOOH \rightarrow CH_3CHO + CO_2$

130. Find the CORRECT statement -
(1) Cambium is not essential in grafting.
(2) In monocots, grafting is done only in roots.
(3) In *Begonia*, epiphyllous buds are produced on the surface of leaf.
(4) Thalamus of flower is a shoot without condensed internodes.

131. Find the CORRECTLY matched pair -
(1) Intine - Cellulose, Pectin
(2) Uniporate Pollen grains - Dicots
(3) Smooth exine - Insect pollination
(4) Tapetum - haploid nucleus

132. Find the INCORRECT statement -
(1) Shifting of nuclei occurs after 3rd nuclear division in embryo sac.
(2) In angiosperms, embryo sac is exosporic, 7 celled, 8 nucleated polygonum type.
(3) Nucellus is made up of many diploid parenchyma cells.
(4) In angiosperms, embryo sac may be bisporic tetrasporic.

133. Following given are few advantages of autogamy. Identify the INCORRECT statement
(1) A sure method of pollination
(2) The chances of new character combinations are more
(3) Least wastage of pollen grains
(4) Pure lines are maintained

134. In Gymnosperms, ____ nourishes the developing embryo.
(1) 3n, multicellular, female gametophyte
(2) n, multicellular, female gametophyte
(3) 2n, female gametophyte
(4) 2n, unicellular, female gametophyte

135. Find the CORRECT statement -
(1) Motile male gametes are transported to female gamete through a pollen tube is called siphonogamy.
(2) Wheat seeds are ex-albuminous.
(3) The most common type of endosperm shows centripetal wall formation.
(4) Cross pollination by any agent is never by chance.

136. Find the CORRECT match -
(1) *Callistemon* - Sticky pollen grains
(2) *Cestrum* - Flowers lack fragrance
(3) *Michelia* - Protandry
(4) *Bignonia* - Chiropterophily

SPACE FOR ROUGH WORK

137. Identify the appropriate statement w.r.t. apomixis.
(1) Apomictic seeds are shown in *Helianthus annus*.
(2) Apomixis is a form of sexual reproduction which mimics asexual reproduction
(3) In some species, haploid egg cell is formed without reduction division.
(4) Egg cell developes into an embryo with double fertilization.

138. Identify the plant from the following features-
a. Leaf is succulent with crenate margin
b. Foliar buds are produced in the notches at the tip of lateral veins.
(1) *Cynodon* (2) *Kalanchoe*
(3) *Asparagus* (4) *Dahlia*

139. Find the INCORRECT statement -
(1) CO_2 fixed/g chl/hour is the unit for gross primary productivity.
(2) Decomposition reduces greatly in anaerobic respiration.
(3) Catabolism is carried by only fungal enzymes.
(4) Micro-consumers are commonly called decomposers.

140. Find the appropriate combination from the following -
(1) 5th May - World environment day
(2) Montreal Protocol - Effective in 1981
(3) N_2 gas - 6% of total green house gases
(4) Mining of phosphate - decreased phosphorous cycle

141. Which of the following is not the component of ecosystem structure?
(1) Composition of biological community & distribution
(2) Quantity & distribution of living materials
(3) Gradient of height of plants
(4) Quality and distribution of non living materials

142. The part of chromosome beyond nucleolar organizers and short, spherical is called
(1) telomere
(2) chromomere
(3) satellite
(4) chromonemata

143. Find the CORRECT match -
(1) Haemophilia - recessive sex linked
(2) Honey bee, n - 32
(3) α globin chain - chromososme 11
(4) Webbing of neck - 44 + XXY

144. Match the following -

Column - I		Column - II	
a.	β globin chain	p.	Epicanthal skin fold
b.	Flat hand with characteristic crease	q.	44 + XO
c.	Downward slanting of eyelids	r.	Chromosome 11
d.	Low posterior hair line	s.	Simian crease

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

145. Which of the following is not the symptom of Down's Syndrome?
(1) Mental retardation
(2) Flat face, rounded flat nose, mouth open
(3) Inability to synthesise haemoglobin
(4) Simian crease

146. Find the inappropriate combination
(1) Human Blood Clotting Factor VIII - Haemophiliacs
(2) DNase - Increase dairy yields
(3) Recombinant vaccine - prophylaxis
(4) TPA - dissolves blood clots

SPACE FOR ROUGH WORK

147. Find the relevent statement related to the advantages of transgenic animals-
(1) A super ovulated mouse can yield upto 60 eggs
(2) More than 60% of transgenic animals are mice
(3) A mouse can carry upto 20 offsprings
(4) Rosie produced human protein enriched milk (2.4 grams per litre)

148. Southern blotting cannot be done by :-
(a) nylon membrane & introcellulose membrane
(b) nitrocellulose membrane and parchment membrane
(c) semi - permeable membrane
(d) Tonoplast & nitrocellulose membrane
(1) a only (2) a & c only
(3) b & d only (4) b, c and d

149. Find the inappropriate combination -
(1) Human Insulin - E.*coli*
(2) Charles Best - Purified Hepatitis B vaccine
(3) HGP - US department of Energy and National Institute of Health
(4) X Ray film - Documentation of DNA bands

150. Find the proper sequence of events related to DNA profiling.
(1) *in vitro* DNA replication → Isolation → Application of charge and DNA fragment movement
(2) Application of charge and DNA fragment movement → Embedding of DNA strands into nylon membrane → Sample DNA and probe DNA form double stranded structure
(3) Isolation → DNA fragmentation→ *in vitro* DNA replication
(4) Application of charge and DNA fragment movement → Sample DNA and probe DNA form double stranded structure → Embedding of DNA strands into nylon membrane

151. Which one is CORRECT option?
(1) *Phytophithora palmivora* is herbicide.
(2) *Pseudomonas* is a herbicide as well as mycoherbicide.
(3) *Phytophthora palmivora* is fungicidal while *Ribosema locustae* is a corn borer.
(4) Breaking dormancy and inducing flowering also by the *Sclerotiana libertine*.

152. Match the column & choose the CORRECT options -

	Column - I		**Column - II**
a.	*Aspergillus niger*	p.	edible mushroom
b.	*Saccharomyces cerevisiae*	q.	vitamins
c.	*Agaricus bisporus*	r.	organic acid
		s.	invertase

(1) a = q & r
b - s & r
c - p & s
(2) b - s
c - p & r
(3) a - q & r
b - s
c - p
(4) a - q & r
b - s
c - p

153. Which of the following significantly reduces the biochemical oxygen demand of the effluent in STP?
(1) Masses of algae associated with fungal filament
(2) Masses of bacteria, associated with algal filament
(3) Masses of bacteria, associated with fungal filament
(4) Masses of algae associated with virus

SPACE FOR ROUGH WORK

154. Which one is CORRECT statement?

(1) Theory of biogenesis explain origin of first life on earth and also explain the continuity of life.

(2) Autobiogenesis or spontaneous generation theory was supported by believers of theory of panspermia

(3) Self assembly theory of origin of life was formulated by Oparin and Haldane.

(4) Protobiogensis occured about 3 billion years ago on primordial earth.

155. Find out the appropriate fill-ups for A, B, C & D (either all four of them or any three) from the given options, correctly:-

(A)	Earth originated about (A) million years ago
(B)	Heaviest elements formed the (B)
(C)	(C) formed by the highest elements
(D)	Atmosphere of the primitive earth was (D)

(1) A - 3 million
B - crust and mantle
D - oxidising type

(2) B - core of earth,
C - Atmosphere
D - reducing type and there was maximum hydrogen

(3) A - 4.6 billion years ago
B - Core of earth
C - oxidising type and there was no free oxygen

(4) A - 4.6 billion, B - core of earth
C - Atmosphere
D - Reducing type and there was free oxygen

156. Which one is INCORRECT features for primitive atmosphere?

(1) Hydrogen element was very active.

(2) Earth surface was cooled down then highly reactive free radicals like CH, NO, CH_2 were formed and condensed to only unsaturated hydrocarbons.

(3) Protein molecule is a landmark in the origin of life.

(4) The unique feature of hot dilute soup was that the molecules did not show any degradation as there was no free oxygen and the enzymes.

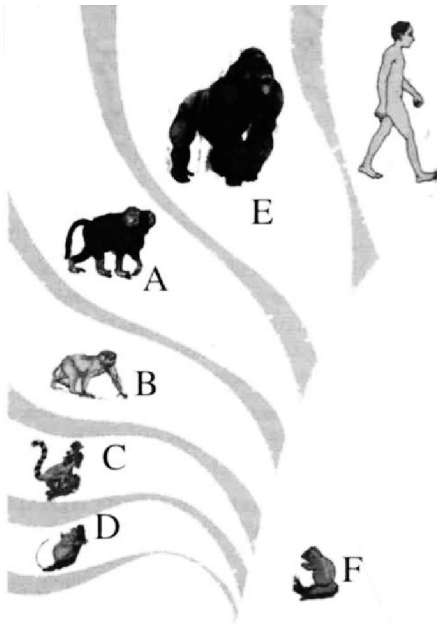
157. Which one is the CORRECT match?

	Column - I	**Column - II**
a.	Origin of vertebrates	p. Silurian
b.	Origin of winged insects	q. Devonian
c.	Origin of jawed fishes	r. Ordovician
d.	Origin of Amphibians	s. Carboniferous

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

SPACE FOR ROUGH WORK

158. CORRECT set for the given diagram is -



(1) A. - New world monkey
B. - Tarsier
C. - Lemur

(2) A. - New world monkey
B. - Old world monkey
C. - Lemur
D. - Tarsier

(3) A. - Old world monkey
B. - New world monkey
D. - Tarsier
E. - Ape

(4) A. - Old world monkey
B. - New world monkey
C. - Tarsier
D. - Lemur

159. A. Fertile eggs develop into embryoes and become infective after I .
B. The larvae mature further in the lungs upto II and ultimately reaching the small intestine and developed into adult worm, it can live for III .
C. The mebendazole and albendazole included in IV.

(1) A - I - 18th days to several weeks.
B - II - 10 to 14 days, III - 1 to 2 years
C - IV - Ascaricides

(2) A - I - 10 to 14th days to several month.
B - II - 18 to 20 days, III - 3 to 6 month
C - IV - Ascaricides

(3) A - I - 4 to 16th days to several years.
B - II - 10 to 14 days, III - 1 to 2 month
C - IV - Ascaricides

(4) A - I - 18th days to several weeks
B - II - 10 to 14th days, III - 1 to 2 month
C - IV - Ascaricides

160. Match the column -

	Column - I		Column - II
a.	Diethyle-carbamacine	p.	R.S.V
b.	Amantadine & Rimantadine	q.	*Influenza*
c.	Mabendazole	r.	*Brugia malayi*
d.	Zanami vir and oseltamivir	s.	*A. Lumbricoides*

Which one is the CORRECT answer?

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

SPACE FOR ROUGH WORK

161. Which one of the following statements is CORRECT with respect to AIDS?
(1) The causative HIV retrovirus enters helper T-lymphocytes and causes reduction in their number
(2) The HIV can be transmitted through eating food together with an infected person
(3) Drug addicts are least susceptible to HIV infection
(4) AIDS patients are being fully cured with proper care and nutrition

162. Which one of the following is the CORRECT statements regarding the particular psychotropic drug specified?
(1) Barbiturates cause stimulation and temporary euphoria
(2) Hashish has effects on cardio vascular system of body
(3) Opium stimulates nervous system and causes hallucinations.
(4) Morphine leads to delusions and disturbed emotions.

163. Select the CORRECT statement -
(1) Cocaine is given to patients after surgery as it stimulates recovery
(2) Barbiturates when given to criminals make them tall the real incidence
(3) Morphine is often given to person who have undergone surgery as a pain killer
(4) Chewing tobacco lowers blood pressure and heart rate

164. The mating of two closely related individual within the same breed for 4 to 6 generation, which one is an odd statement?
(1) Harmful recessive genes are exposed by above process.
(2) Helps in accumulation of superior genes and elimination of harmful genes.
(3) Increase the productivity of inbreed population.
(4) Usually reduces fertilisation and even productivity

165. Which one is CORRECT option?
(1) Holstein and Brown Swiss are exotic breeds while Jersy and Sahiwal are Indian breeds.
(2) Leghorn is the best layer while plymouth and Aseel are preferred broilers.
(3) Management of broiler done by the vaccination.
(4) Ranikhet and coccidiosis are viral disease of poultry.

166. Which one is an INCORRECT option?
(1) In English, breeds of poultry are Australoop and Langshan.
(2) Out crossing is the best breeding method for animals which are below average in milk productivity, growth rate in beef, cattle etc.
(3) Semen in the frozen state remains alive for long duration and convenient for transport.
(4) A single out cross often helps to overcome inbreeding depression.

167. Which one is CORRECT match?

1. American breed of poultry	-	Cochin
2. Indian breeds of poultry	-	Aseel
3. Asiatic breeds of poultry	-	Leghorn
4. Mediteranean breeds of poultry	-	Plymouth rock

SPACE FOR ROUGH WORK

168. Which of the following statement is false related to blood ?
(1) Fluid connective tissue
(2) pH 7.4
(3) Derived from endoderm
(4) Average 5L in adult

169. Identify the CORRECT option for the following-

Name of cell	Size	Life span	Numbers
A. Erythrocytes	p. 2.5 to 5 µm	x. 3 to 4 days	a. 5 to 9 thousands
B. Leucocytes	q. 7 µm	y. 5 to 10 days	b. 5.1 to 5.8 million
C. Thrombocytes	r. 8 to 15 µm	z. 100 to 120 days	c. 2.5 to 4.5 lakhs

(1) A - q, z, b B - r, x, a C - p, y, c
(2) A - r, z, b B - q, y, a C - p, x, c
(3) A - q, z, b B - p, y, a C - r, x, c
(4) A - p, z, a B - q, y, b C - r, x, c

170. How many openings are present in the right atrium to provide deoxygenated blood to it?
(1) Two (2) Three (3) Four (4) One

171. A person is found to have a resting cardiac output of 5600 ml per minute and a heart rate of 80 beats per minute. What is his stroke volume?
(1) 125 mL (2) 70 mL
(3) 75 mL (4) 100 mL

172. Which one of the following options are CORRECTLY matched?

Example	Type of immunity
1. Saliva in mouth and tears in eyes	Physical barriers
2. Mucus coating of epithelium lining the urinogenital tract the HCI in stomach	Physiological barriers
3. Polymorphonuclear leukocytes and monocytes	Cellular barriers
4. Anti-tetanus and anti-snake bite injections	Active immunity

173. Which one is CORRECT match?

Animal	Excretory product	Volume of water required per gm
a. Tadpole larva of frog	p. Guanotelism	w. 50 ml
b. Marine fishes & frog	q. Ureotelism	x. 300 to 500 ml
c. Land snail & terrestrial insects	r. Uricotelism	y. 10 ml
d. Penguins	s. Aminotelism t. Ammonotelism	z. 10 to 20 ml

(1) a - t - x, b - q - w, c - r - y, d - p - z
(2) a - s - x, b - q - w, c - r - y, d - p - z
(3) a - s - x, b - r - w, c - q - y, d - p - z
(4) a - s - x, b - q - w, c - r - z, d - p - y

174. A Renal pyramids
↓
Narrow apex of pyramid called B
↓
Each minor calyx receives urine from collecting ducts and about C joint to form D toward papilla of pyramid.
(1) A - 6 to 20
B - Renal papillae
C - 7 to 8 collecting ducts
D - duct of Bellini
(2) A - 8 to 16
B - minor calyx
C - 3 to 5 collecting duct
D - duct of Bellin
(3) A - 6 to 20
B - Minorcalyx
C - 7 to 8 collecting ducts
D - Columns of bertini
(4) A - 8 to 16
B - Renal papillae
C - 7th to 8 collecting ducts
D - Columns of berths.

SPACE FOR ROUGH WORK

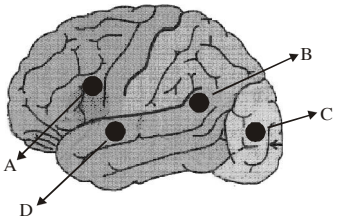
175. High threshold and, low threshold or no threshold substances are _____.
(1) Uric acid & Amino acid respectively.
(2) Urea and Glucose respectively.
(3) Amino acid and uric acid respectively.
(4) Glucose and amino acid respectively.

176. Which one is CORRECT statement?
(1) Creatinine is seceted and absorbed by the PCT.
(2) Hydrogen secretion take place in only DCT & CT.
(3) Iodine containing compound iodopyracet secreted out into the urine.
(4) Hydrogen ion are passively transported by the tubular cells.

177. In ARF, rapidly progressive loss of renal function generally characterized by decreased urine production in adult (A) , children (B) and in infant (C) respectively.
(1) less than 400 ml/day.
less than 0.5 ml/kg/day
less than 1ml/kg/day
(2) less than 400 ml/day
less than 0.5ml/kg/h
less than 1ml/kg/h
(3) less than 400 ml/day
less than 0.5ml/kg/h
less than 0.1 ml/kg/h
(4) less than 400ml/day
less than 1ml/kg/h
less than 0.5ml/kg/h

178. Read carefully the following four statements (a-d) regarding kidney transplant -
a. Even if a kidney trnasplant is proper the recipient may need to take immunosuppressants for a long time.
b. The cell-mediated immune response is responsible for the graft rejection.
c. The B-lymphocytes are responsible for rejection of the graft.
d. The acceptance or rejection of a kidney transplant depends on specific interferons.
Choose the CORRECT option.
(1) a & b (2) b & c
(3) c & d (4) a & c

179.

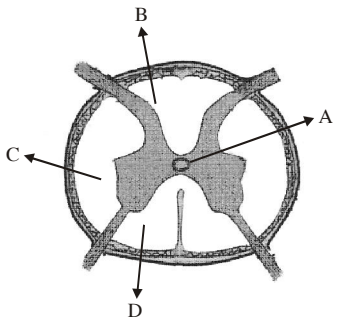


(1) A - Broca's area motor speech area and its control the movement of tongue, lips and vocal cords.
B - General motor area which controls the voluntary activity
(2) C - Association visual area for perception, analysis and storing information obtained by sight.
B - Wernicke's area called sensory speech area.
(3) D - Audiosensory area for the perception and analysis of information obtained by phonoreceptor.
C - Gaustatory area for the perception of taste.
(4) A - Broca's area controls movement of tongue, lips and vocal cord.
C - Audiopsychic area for storing of information, which are obtained by phonoreceptor.
B - Wernicke's area called motor speech area.

SPACE FOR ROUGH WORK

180. 3F (Fight, Flight & Fright) emergency, action controlled by the
(1) Sympathetic nervous system and Acetylcholin
(2) Parasympathetic nervous system and nor - adrenaline
(3) Sympathetic nervous system and nor - adrenaline
(4) Parasymathetic system and Acetylcholine

181. What are correct regarding labelling in following diagram ?



(1) A - Ependyma is internal lining of central canal.
B - Site for ascending tract and conduct sensory impulse to the brain.
C - Site for descending tract and carry motor impulse to spinal cord.
(2) B & C - Site for descending tract carry motor impulse to spinal cord.
D - Site for ascending tract conduct sensory impulse to brain.
(3) A - Ependyma is columnar epithelial neurogenic cells for conduction of impulse from brain to spinal cord.
B - Site for ascending tract located at posterior funiculli and conduct sensory impulse.
(4) C - Site for ascending tract and conduct motor impulse to spinal cord
D - Site for descending tract and conduct sensory impulse to brain.

182. Which one is INCORRECT option?
a. Only vitreous humor maintain the shape of the eyeball.
b. The greatest visual activity have whole retinal wall.
c. The purple red protein called rhodopsin which is vitamin A derivative.
d. Sense organ have been described as windows for the brain.
(1) a & d (2) c & d
(3) a & b (4) a & c

183. The cones & rods contain photopigments, which are I, they are composed of opsin and II. The light induces dissociation of retinal from the III resulting in changes in the structure of the IV. This causes the change in the permiability of the retinal cells.
(1) I - Conjugated protein
II - Retinal (Vitamin A derivative)
III & IV - Opsin.
(2) I - Rhodopsin
II - Vit-C
III- Opsin
IV- Rhodopsin
(3) I - Conjugated protein
II - Retinal (Vitamin A derivative)
III - Rhodopsin
IV - Opsin
(4) I - Opsin
II - Retinal (Vitamin A derivative)
III & IV- Rhodopsin

SPACE FOR ROUGH WORK

184. Read the statement carefully-

a. Only the skin of meatus contains fine hairs and ceruminous glands.

b. Tympanic membrane or ear drum is formed by the muscular tissue.

c. Stapes is connected to the round window of the internal ear.

d. Organ of corti located on tectorial membrane.

e. Hair cells are ciliated columnar epithelial cells present in rows.

Which one is the CORRECT option?

(1) A, B and E (2) B, C & E

(3) A, B & C (4) only E

185. Which one is INCORRECT?

(1) Pituitary gland is well protected in a depression of the sphenoid bone called sella tursica.

(2) Pituitary gland and thyroid gland, originated by the ectoderm, endoderm respectively.

(3) Adenohypophysis develops as an outgrowth called Rathke's pouch from the roof of embryonic buccal cavity.

(4) Neurohypophysis contains axons in between pituicytes and axonic fibers end in knobs called herrings bodies. Hormones of neurohypophysis release by the paraventricular nucleus.

186. Read the statements carefully -

a. Somatostatin regulates somatatrophic secretion and also responsible for the absorption of Ca^{++} to the bone.

b. High level of oestrogen in female signals negative feedback to pituitary and stops secretion of LH.

c. High level of progesterone and testosterone in blood gives negative feedback signal to pituitary so LH and ICSH secretion is stopped respectively.

d. ADH is a vasodilator and ADH secretion is regulated by increase or decrease of osmotic pressure of blood in feedback manner.

Which one is the CORRECT option?

(1) a & c (2) only d

(3) only c (4) b & d

187. Match the following:

Column - I	Column - II
a. Myxoedema	p. Feeble cardiac action
b. Exopthalmic goiter	q. Polyurea & polydipsia
c. Addision's disease	r. Puffiness of face
d. Cushings disease	s. Auto immune disease
e. Diabetes insipidus	t. Alkalosis & polydipsia

(1) a - r, b - s, c - p, d - t, e - q

(2) a - r, b - s, c - t, d - p, e - p

(3) a - s, b - r, c - p, d - q, e - t

(4) a - s, b - p, c - r, d - q, e - t

188. Read the statements carefully -

a. Gastrin $\rightarrow$ stimulates gastric gland for the secretion of HCl and pepsinogen.

b. CCK $\rightarrow$ acts on exocrine pancreas and stimulates secretion of bicarbonates, enzymes and bile juice.

c. GIP $\rightarrow$ inhibit gastric secretion and motility

d. Secretin $\rightarrow$ acts on pancreas and gall bladder. It stimulate the secretion of enzymes and bile juice.

e. Thymus gland is located behind the sternum.

Which one is the CORRECT match?

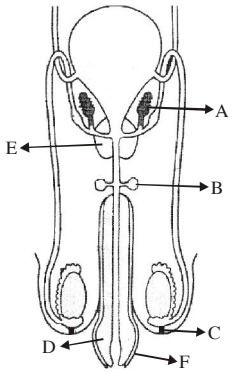
(1) a, b & d (2) b, d & e

(3) a, c, e (4) a & c

SPACE FOR ROUGH WORK

189. What is CORRECT for asexual reproduction?
(1) Somatogenic reproduction involves mitotic division as well as meiosis also.
(2) In agamogeny, variation may be rarely seen due to mutation.
(3) During gemmulation a layer of amoebocytes secrete hard, chitinous membrane around these archeocytes and form external bud during unfavourable conditions.
(4) Ephydatia and ascidians are the examples of gemmulation.

190.



Which one is the CORRECT option for given labelling?
(1) A - Homologus to uterus masculinous.
B - Homological and analogical similar to Bartholin's gland.
F - Homologus to scrotum.
(2) C - Homologus to mesovarian ligament.
D - Homological and Analogical disimilar to glans of clitoris.
E - Similar to labia minora.
(3) A - Homologus to womb.
B - Homologus to Bartholin's gland.
C - A short fibro muscular band called Gubernaculum.
(4) E - Only present in male.
F - Foreskin in homologous to labia majora.

191. Read the statements carefully -
I - Oogenesis begins before the birth of female baby, the ovaries contain A or more oogonium which become B about six months before a human female is born.
II - At the time of birth about C are present in each ovary and only about D remain by the time of puberty, rest being degenerated.
III- Ovarian cortex is line by E . Oogonia arise from F .
Which one is the CORRECT option?
(1) A - 2 million
B - primordial germ cell
E - cuboidal epithelium
F - mesoderm of yolk sac
(2) A - 2 million
B - primary oocytes
C - 1 million primordial follicle
F - endoderm of yolk sac
(3) A - 1 million
C - 2 million primary oocytes
D - 40000 in each ovary
F - mesoderm of yolk sac
(4) B - primary oocytes
C - 2 million primordial follicle
E - cuboidal epithelium
F - endoderm of yolk sac

192. Which one is INCORRECT option?
(1) Single layer of follicular cells surround each oocyte and the entire structure called a primordial follicle.
(2) Primordial follicle start to grow and they become primary follicle and finally which are surrounded by 6-7 layers of granulosa cell.
(3) The follicle grows, it forms a clean lipoprotein layer called the zona pellucida between primary oocytes and granulosa cells.
(4) When follicular body secrete follicular fluid and form a cavity. Now it is called secondary follicle.

SPACE FOR ROUGH WORK

193. Among the following processes, which one involves 90 days or longer duration?
(1) A primordial follicle to develop into secondary follicle.
(2) A primary follicle to develop into secondary follicle.
(3) Primary oocyte to develop into secondary oocyte.
(4) Primordial follicle to primary follicle.

194. Read the statement carefully -
a. If the ovum is fertilized, corpus luteum secretes progesterone and A .
b. Fallopian tube is about 10 to 12 cm long and lined by B .
c. Fallopian tube is supported by a double fold of peritonium called C.
(1) A - oestrogen
C - mesovarian
(2) B - ciliated cuboidal epithelium
C - mesosalpinx
(3) B - ciliated columnar epithelium
C - mesosalpinx
(4) A - relaxin and oxytocin
B - ciliated columnar epithelium
C - mesovarian

195. What is false during menopause ?
(1) ovaries suddenly become more responsive to the FSH and LH.
(2) menstrual cycle become irregular and then stops
(3) shows effects like osteoporosis, palpitation, hot flushing etc.
(4) hot flushing, increase in blood cholesterol sweating these are the secondary effects.

196. Read the statements carefully -
a. During menstrual flow about 35 to 45 ml of blood is lost.
b. Theca interna is avascular layer with fibrous connective tissue these cells become endocrine and secrete female sex hormone called progesterone.
c. Theca externa is inner layer of follicle and consist of loose connective tissue.
d. If the fertilization takes place, the fertilized egg passes through fallopian tube and reaches the uterus on third day after ovulation.
Which one is CORRECT option?
(1) only a
(2) b & c
(3) only d
(4) a & d

197. Abortion occur if -
(1) corpus luteum becomes active after the formation of placenta.
(2) the LH and hCG level increase during 1st trimester.
(3) corpus luteum becomes inactive before the formation of placenta about three months of pregnancy.
(4) corpus luteum becomes inactive in 2nd trimester.

198. Which of the following part is called "energy chamber" of sperm ?
(1) Head
(2) Neck
(3) Middle piece
(4) Tail

SPACE FOR ROUGH WORK

199. Which one is CORRECT?

(1) The primitive cells were marine and autotrophic in nature.

(2) Growth and multiplication of primitive cells caused deposition in food and increase in CO_2 due to oxido-reduction.

(3) Chromophores had the ability to trap light energy and convert it into chemical energy. This event helped in the transformation of autotrophs into Heterotrophs.

(4) Proteins aggregated in the form of spherical colloidal droplets were called microspheres. Coacervates and the microsphere were the forerunners of the first form of life on this earth.

200. 1. Menstruation phase — 1^{st} to 4^{th} — A

2. B — 5^{th} to C — increase oestrogen level which are secreted by follicular cells of ovary.

3. Secretory phase — D to 28^{th} — E

Which one is the CORRECT option?

(1) A - Amount of progesterone decrease while FSH increase
B - Proliferative phase
C - 13th day
D - 15th day
E - Progesterone level increase

(2) A - Amount of oestrogen decrease while FSH increase
B - Proliferative phase
C - 14th days
D - 15th days
E - Progesterone level increase

(3) A - Amount of progesteron increase while LH increase
B - Proliferative phase
C - 13th days
D - 14th days
E - Progesterone level decrease

(4) A - Amount of progesteron decrease while FSH increase
B - Proliferative phase
C - 12th days
D - 14th days
E - Oestrogen level increase

SPACE FOR ROUGH WORK

SPACE FOR ROUGH WORK