20/03/2022

RM_ CODE-A

Corporate Office : Aakash Tower, 8, Pusa Road, New Delhi-110005, Phone : 011-47623456

MM : 720

REVISION TEST SERIES

Time : 3.00 Hrs.

(*for* NEET-2022)

Test – I

Topics covered :

Physics : Electric Charges and Fields Electrostatic Potential and Capacitance

Chemistry : Haloalkanes and Haloarenes

Botany : Reproduction in Organisms, Sexual Reproduction in Flowering Plants

Zoology : Reproduction in Organisms, Human Reproduction

Instructions :

(i) There are two sections in each subject, i.e. Section-A & Section-B. You have to attempt all 35 questions from Section-A & only 10 questions from Section-B out of 15.

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

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

(iv) Mark should be dark and completely fill the circle.

(v) Dark only one circle for each entry.

(vi) Dark the circle in the space provided only.

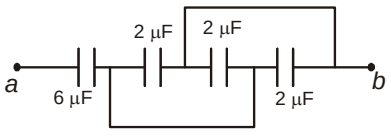
(vii) Rough work must not be done on the Answer sheet and do not use white-fluid or any other rubbing material on the Answer sheet.

PHYSICS

Choose the correct answer:

SECTION - A

1. The effective capacitance between the points *a* and *b* in the network shown below is



(1) 2 μF

(2) $\frac{20}{3}$ μF

(3) 6 μF

(4) 3 μF

2. There are two concentric conducting spherical shells of radi *R* and 2*R*. The outer shell is given a charge *Q* while inner shell is earthed. The charge on inner shell is

(1) *Q*

(2) $-\frac{Q}{2}$

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

(4) Zero

3. There is uniformly charged conducting shell of radius 10 cm. The potential at a distance 4 cm from the centre of the shell will be [charge on the shell is 10 μC]

(1) 18×10^5V (2) 9×10^5V

(3) 8×10^5 V (4) 6×10^5 V

4. A closed solid conductor of irregular shape is given some fixed amount of charge. The correct statement regarding the conductor in electrostatic condition is

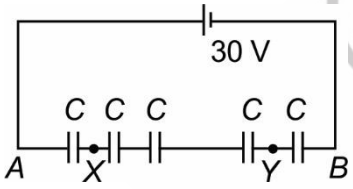
(1) Potential of conductor will change if its shape is changed

(2) Electric field inside it is non-zero

(3) All points on its surface will have same charge density

(4) All of these

5. An arrangement of five identical capacitors is shown in given circuit, the potential difference between *X* and *Y* is



(1) 18 V (2) 30 V

(3) 12 V (4) Zero

6. There are two charges + 3 μC and – 4μC placed at a certain distance apart. The ratio of coulombic forces acting on them will be

(1) 9 : 16 (2) 2 : $\sqrt{3}$

(3) 1 : 1 (4) 3 : 4

7. An electric dipole of dipole moment $\left(2\hat{i}+3\hat{j}\right)$μC m is placed inside a uniform electric field $\left(3\hat{i}+2\hat{j}\right)\times10^5$ N/C. The torque acting on the dipole is

(1) $0.4k$ N m

(2) $-0.3k$ N m

(3) $0.2k$ N m

(4) $-0.5k$ N m

8. An electric dipole is placed in an electric field generated by a point charge, then

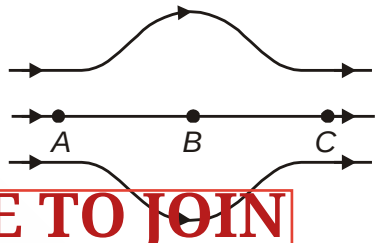
(1) The net electric force on the dipole must be zero

(2) The net electric force on the dipole may be zero

(3) The torque on the dipole due to the field may be zero

(4) Both (1) and (3)

9. The field lines corresponding to an electric field is shown in the figure, then (*E* denotes electric field)



(1) $E_A = E_B = E_C$ (2) $E_A = E_B > E_C$

(3) $E_A = E_C > E_B$ (4) $E_A = E_C < E_B$

10. A positive charge *q* is enclosed by a Gaussian spherical surface of radius *a*. If its radius is increased to 4*a* then the net outward flux will

(1) Become four times

(2) Become two times

(3) Become sixteen times

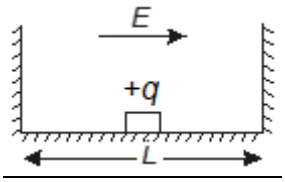
(4) Remain same

11. A wire of length *l* and charge *q* is bent in form of a semicircle. The charge is uniformly distributed over the length. The electric field at the centre of semicircle is

(1) $\frac{q}{\varepsilon_0 l^2}$ (2) $\frac{q}{2\varepsilon_0 l^2}$

(3) $\frac{q}{4\pi\varepsilon_0 l^2}$ (4) $\frac{q}{2\pi\varepsilon_0 l^2}$

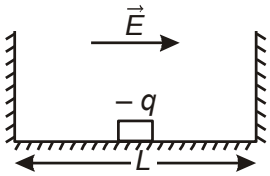
12. A charge +*q* having mass *m* is released from rest in a uniform electric field *E*. Momentum acquired by the charge after time *t* is



(1) qEt (2) $\frac{qEt}{m}$

(3) $\frac{qE}{m}$ (4) $\frac{qEm}{t}$

13. A block of mass m having charge $-q$ is placed midway between two parallel walls. A uniform electric field $\vec{E}$ is switched on as shown in figure. The time after which it will collide with the right wall for the first time is [All collisions are elastic and surfaces are smooth]



(1) $\sqrt{\frac{mL}{qE}}$

(2) $\sqrt{\frac{2mL}{qE}}$

(3) $\sqrt{\frac{3mL}{qE}}$

(4) It will not collide with the right wall

14. A uniformly charged conducting sphere of 1.2 m radius has surface charge density of 80.0 μC m^{-2}. The flux leaving the surface of the sphere is

(1) 1.64×10^8 Nm^{2}C^{-1} (2) 3.21×10^7 Nm^{2}C^{-1}

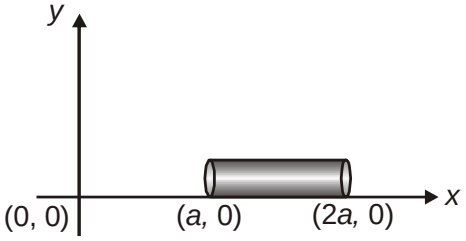
(3) 2.6×10^7 Nm^{2}C^{-1} (4) 5.2×10^8 Nm^{2}C^{-1}

15. A positive point charge 20 μC is located at the point $\vec{r}_0 = (2\hat{i} + 3\hat{j})$ m, where $\hat{i}$ and $\hat{j}$ are the unit vectors along the x-axis and y-axis respectively. Electric field at a point having position vector $\vec{r} = (8\hat{i} - 5\hat{j})$ m will be

(1) $360\,(3\hat{i} - 4\hat{j})$ N/C (2) $360\,(6\hat{i} - 8\hat{j})$ N/C

(3) $180\,(3\hat{i} - 4\hat{j})$ N/C (4) $450\,(6\hat{i} - 8\hat{j})$ N/C

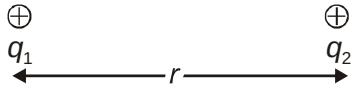
16. A cylinder of radius R is placed in an electric field $\vec{E} = x^2\hat{i}$ as shown in the figure. The net electric flux through the cylinder is (consider SI units for all)



(1) Zero (2) $(a^2)\pi R^2$

(3) $(3a^2)\pi R^2$ (4) $(5a^2)\pi R^2$

17. If a dielectric material of dielectric constant ε_r is completely filled between two-point charges as shown in the figure, then the net electrostatic force on q_1 is



(1) $\frac{1}{4\pi\varepsilon_0}\frac{q_1q_2}{r^2}$ (2) $\frac{1}{4\pi\varepsilon_0\varepsilon_r}\frac{q_1q_2}{r^2}$

(3) $\frac{\varepsilon_r}{4\pi\varepsilon_0}\frac{q_1q_2}{r^2}$ (4) Zero

18. The angle between the electric dipole moment of a dipole and the electric field produced due to it, on the equatorial line is

(1) 0° (2) 90°

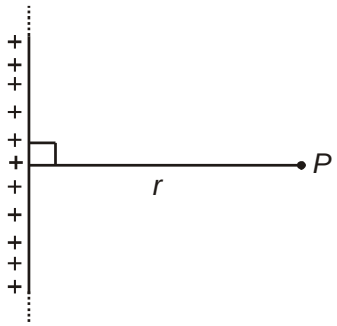
(3) 180° (4) 270°

19. An electric dipole of dipole moment 9×10^{-6} Cm is aligned at 30° with the direction of uniform electric field of magnitude 6×10^5 N/C. The magnitude of torque acting on dipole is

(1) 6.2 N m (2) 5.4 N m

(3) $5.4\sqrt{3}$ N m (4) 2.7 N m

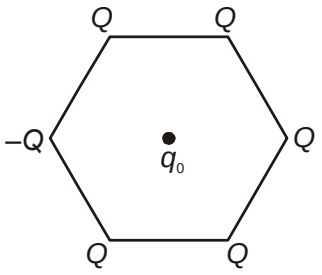
20. An infinite wire is placed along y-axis having uniform linear charge density λ. The electric field intensity at point P is $\left(K = \frac{1}{4\pi\varepsilon_0}\right)$



(1) $\frac{2K\lambda}{r}$ (2) $\frac{K\lambda}{r}$

(3) $\frac{K\lambda}{2r}$ (4) $\frac{K\lambda}{4r}$

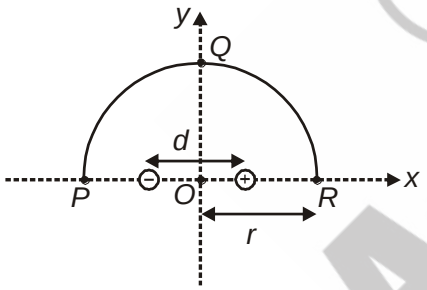
21. Five charged particles each $+Q$ and one $-Q$ are placed at the six corners of a regular hexagon of sides length a. The electrostatic force acting on charge q_0 placed at the centre is



(1) $\frac{1}{4\pi\varepsilon_0}\cdot\frac{6Qq_0}{a^2}$ (2) $\frac{1}{4\pi\varepsilon_0}\cdot\frac{2Qq_0}{a^2}$

(3) $\frac{1}{4\pi\varepsilon_0}\cdot\frac{Qq_0}{a^2}$ (4) $\frac{1}{4\pi\varepsilon_0}\cdot\frac{4Qq_0}{a^2}$

22. An electric dipole is kept at origin as shown in the figure. The point P, Q, R are on a circular arc of radius r. If the electric fields at P, Q and R respectively are $\vec{E}_1$, $\vec{E}_2$, $\vec{E}_3$ respectively then select the correct option ($r >> d$)



(1) $\vec{E}_1 = \vec{E}_3$ (2) $\vec{E}_1 = -2\vec{E}_2$

(3) $\vec{E}_3 = -2\vec{E}_2$ (4) All of these

23. In a certain region of space, electric field is along Z-axis throughout. The magnitude of electric field is not constant but increases uniformly along positive Z-direction at rate of 10^5 N/C per meter. What is force experienced by a system having a total dipole moment equal to 10^{-6} Cm in negative Z-axis direction.

(1) 10 N in negative Z-axis direction

(2) 0.10 N in negative Z-axis direction

(3) 0.01 N in positive Z-axis direction

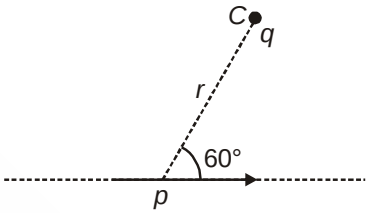
(4) 0.2 N in positive Y-axis direction

24. A long cylindrical volume contains a uniformly distributed charge of density ρ. The electric field at a point inside the cylindrical volume at a distance r from its axis is

(1) $\frac{\rho r}{3\varepsilon_0}$ (2) $\frac{2\rho r}{\varepsilon_0}$

(3) $\frac{\rho r}{2\varepsilon_0}$ (4) $\frac{3\rho r}{\varepsilon_0}$

25. A point charge q is placed at rest at point C at distance r from a short electrical dipole of dipole moment p. The force acting on charge particle is



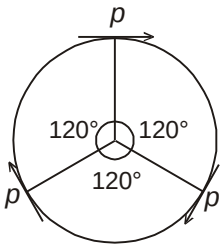
(1) $\frac{\sqrt{7}qp}{4\pi\varepsilon_0 r^3}$

(2) $\frac{\sqrt{7}qp}{8\pi\varepsilon_0 r^3}$

(3) $\frac{\sqrt{5}qp}{4\pi\varepsilon_0 r^3}$

(4) $\frac{\sqrt{5}qp}{8\pi\varepsilon_0 r^3}$

26. Three dipoles each of dipole moment of magnitude p are placed on a circle of radius R as shown. The magnitude of electric field intensity at centre will be



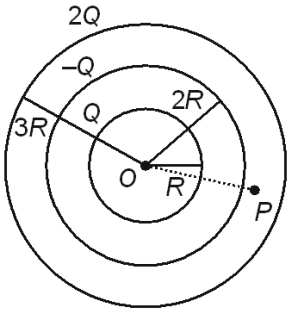
(1) $\frac{4kp}{R^3}$

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

(3) $\frac{kp}{R^3}$

(4) Zero

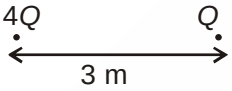
27. There are three conducting concentric spherical shells having charges Q, $-Q$, $2Q$ respectively as shown in figure. The electric field intensity at point P is (where $OP = 2.5R$) $\left(k = \frac{1}{4\pi\varepsilon_0}\right)$



(1) Zero (2) $\frac{3}{4}\frac{kQ}{R^2}$

(3) $\frac{4}{25}\frac{kQ}{R^2}$ (4) $\frac{kQ}{4R^2}$

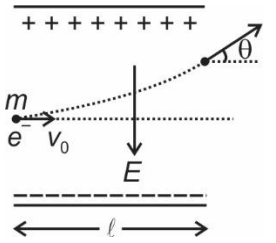
28. Two-point charges $4Q$ and Q are placed on x-axis as shown in the figure. Distance between two charges is 3 m. Net electrostatic field is zero at a distance



(1) 2 m from Q (2) 1.5 m from $4Q$

(3) 1 m from Q (4) 0.75 m from $4Q$

29. A uniform electric field E exists between two parallel identical plates having opposite charges on each plate. An electron enters the field between the plates with speed v_0 as shown in figure. If length of each plate is ℓ, then angle with which electron deviates from its initial path (m is mass of electron) as it emerges out is



(1) $\tan^{-1}\left(\frac{eE\ell}{2mv_0^2}\right)$ (2) $\tan^{-1}\left(\frac{eE\ell}{mv_0^2}\right)$

(3) $\sin^{-1}\left(\frac{eE\ell}{mv_0^2}\right)$ (4) $\sin^{-1}\left(\frac{eE\ell}{2mv_0^2}\right)$

30. Two metal spheres of radii 30 cm and 10 cm are given a charge of 20 μC and 60 μC respectively. They are then connected by a conducting wire. The final charge on the sphere of radius 10 cm is

(1) 10 μC (2) 30 μC

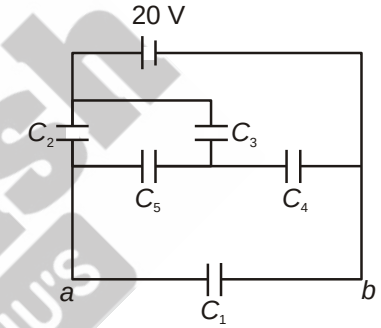
(3) 20 μC (4) 60 μC

31. The diameter of a plate of a parallel plate condenser (composed of a pair of circular plates) is 8 cm. If its capacity is equal to that of a sphere of diameter 160 cm, the separation between the plates of the parallel plate condenser is

(1) 0.2 mm (2) 0.3 mm

(3) 0.4 mm (4) 0.5 mm

32. The energy stored in the capacitor C_1 between terminals a and b is (all capacitors are identical with capacitance 2 μF)



(1) 2 mJ (2) 1 mJ

(3) 0.1 mJ (4) 0.2 mJ

33. Two capacitors of capacitance C and $2C$ and breakdown voltages of V and $\frac{V}{2}$ respectively are connected in series. The breakdown voltage of the series combination is

(1) $\frac{V}{2}$ (2) 2V

(3) $\frac{3V}{2}$ (4) V

34. Consider an electric field $\vec{E} = 10\frac{N}{C}\hat{i}$. The electric flux through a square of cross-sectional area $\left(4\hat{i}\right)$ m^2 is

(1) 16 N m^{2}C^{-1} (2) 24 N m^{2}C^{-1}

(3) 32 N m^{2}C^{-1} (4) 40 N m^{2}C^{-1}

35. A potential difference of 16 V exists across a parallel plate isolated capacitor with air between the plates. When a dielectric slab is introduced between plates (such that the space between the plates is completely filled up by dielectric) for the same configuration, potential difference is 4 V. The dielectric constant of the material is

(1) 8 (2) 4

(3) 2 (4) 10

SECTION – B

36. An α particle, initially at rest, moves through a certain distance in a uniform electric field in time t_1. A proton, also initially at rest, takes time t_2 to move through equal distance in the same uniform electric field. Neglecting the effect of gravity, the ratio $t_1 : t_2$ is equal to

(1) $1:\sqrt{2}$ (2) $\sqrt{2}:1$

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

37. A charge –2 nC is fixed at each of the points x = 1 cm, x = 2 cm, x = 4 cm, x = 8 cm, x = 16 cm, ……, $x = \infty$ on the x-axis. The electric potential at origin (x = 0), due to this system of charges, is

(1) –36 V (2) –1800 V

(3) –3600 V (4) –5400 V

38. Eight identical spherical liquid drops each are at an electric potential 2 V. They coalesce to form one big spherical liquid drop, whose potential is

(1) $\frac{1}{4}$ V (2) 16 V

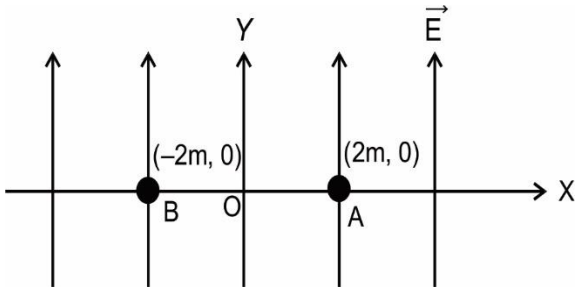
(3) 8 V (4) $\frac{1}{2}$ V

39. Three capacitors C_1 = 3 μF, C_2 = 6 μF and C_3 = 12 μF are joined in series. This series combination is connected to a 14 V battery. The potential difference across the capacitor C_2 is

(1) 2 V (2) 4 V

(3) 6 V (4) 8 V

40. A uniform electric field of 50 V m^{-1} exists in XY-plane, parallel to Y-axis as shown in the figure. The potential difference [$V_A - V_B$] is



(1) 200 V (2) Zero

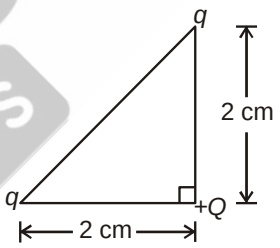
(3) 100 V (4) – 200 V

41. Two parallel plate capacitors having capacitances 6 μF and 3 μF are charged to potentials 25 V and 15 V respectively. If the plates of unlike polarity of the two capacitors are connected together, then the loss of energy in rearrangement of capacitors is

(1) 100 μJ (2) 450 μJ

(3) 1600 μJ (4) 7200 μJ

42. Three charges +Q, q and q are placed at the vertices of a right-angled isosceles triangle as shown in figure. The net electrostatic potential energy of the system of these three-point charges is zero, if q is equal to



(1) $-\frac{Q}{\sqrt{2}}$ (2) $-2\sqrt{2}\,Q$

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

43. The electric potential at a point (x, y, z) in space is given by $V = [x^2y - y^2z - z^2x]$ volt. The electric field at the point [–1 m, –1 m, –1 m] is

(1) $[\hat{i} - \hat{j} - \hat{k}]\,\text{V m}^{-1}$ (2) $[\hat{i} - \hat{j} - 3\hat{k}]\,\text{V m}^{-1}$

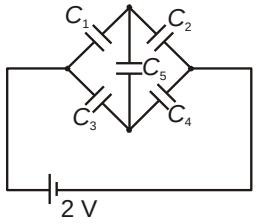
(3) $[-\hat{i} + \hat{j} + 3\hat{k}]\,\text{V m}^{-1}$ (4) $[-\hat{i} + \hat{j} + \hat{k}]\,\text{V m}^{-1}$

44. Two identical metal plates A and B are given charges +20 μC and –60 μC respectively. Now the plates A and B are brought close together to form a parallel plate capacitor of capacitance 20 μF. The potential difference between the plates A and B is

(1) 2 V (2) 4 V

(3) 6 V (4) 8 V

45. In the circuit shown below, C_1 = 3 μF; C_2 = 6 μF; C_3 = 6 μF; C_4 = 12 μF and C_5 = 9 μF. The charge drawn from the battery is



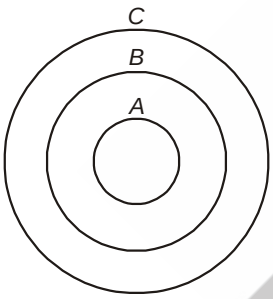
(1) 3 μC

(2) 12 μC

(3) 24 μC

(4) 6 μC

46. Three conducting shells *A*, *B* and *C* are as shown in figure. If +3*Q* charge is given on the inner shell, –2*Q* on the middle shell and +*Q* on the outer shell, then charge on the inner surface of the outermost shell is



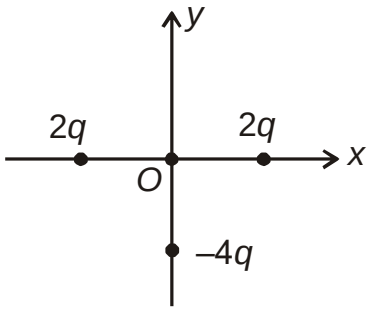
(1) *Q*

(2) +4*Q*

(3) –2*Q*

(4) –*Q*

47. Three charges are placed in *x*-*y* plane as shown in figure, each is at distance *l* from the origin *O*. The dipole moment of this configuration is



(1) $-2ql\,\hat{j}$

(2) $4ql\,\hat{j}$

(3) $-2ql\,\hat{i}$

(4) $2ql\,\hat{i}$

48. A particle of charge 2 μC and mass 2 mg is moving with a velocity of 5 m/s and is subjected to a uniform electric field of magnitude 10 V/m for 3 s. The final speed cannot be

(1) 20 m/s (2) 25 m/s

(3) 30 m/s (4) 35 m/s

49. Electric field on the equatorial plane of a small electric dipole at a distance *r* is $\vec{E}$, then electric field on the axis of the dipole at a distance "4*r*" will be

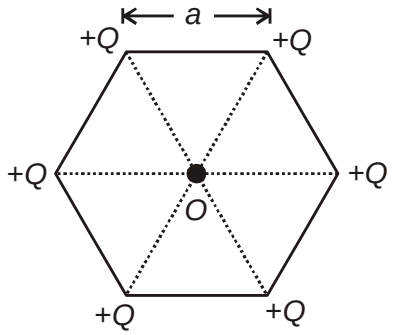
(1) $\frac{\vec{E}}{64}$

(2) $\frac{-\vec{E}}{64}$

(3) $\frac{-\vec{E}}{32}$

(4) $\frac{\vec{E}}{32}$

50. Six charges are placed at the vertices of a regular hexagon of side a as shown in the figure. The electric field at the centre *O* is



(1) Zero

(2) $\frac{3kQ}{4a^2}$

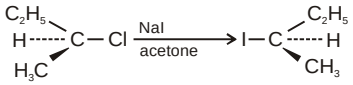
(3) $\frac{3kQ}{4\sqrt{3}a^2}$

(4) $\frac{3\sqrt{3}}{8}\frac{kQ}{a^2}$

CHEMISTRY

SECTION - A

51. The given reaction

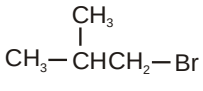
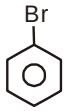


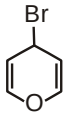
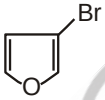
is an example of which reaction?

(1) S_N1 (2) S_N2

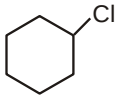
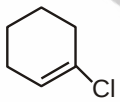
(3) E2 (4) E1

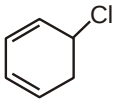
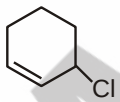
52. Which of the following compound gives pale yellow precipitate with $AgNO_3$ most easily?

(1)  (2) 

(3)  (4) 

53. Elimination reaction by alcoholic KOH will be fastest in

(1)  (2) 

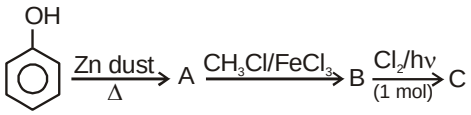
(3)  (4) 

54. $RMgBr + CO_2 \xrightarrow{X} RCOOMgBr \xrightarrow{H_2O} RCOOH$,

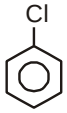
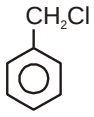
X can be

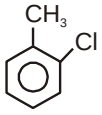
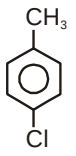
(1) THF (2) Acetone

(3) D_2O (4) H_2O

55. 

Product C is

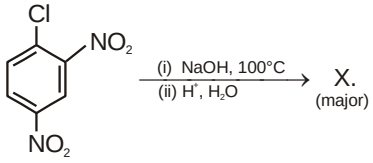
(1)  (2) 

(3)  (4) 

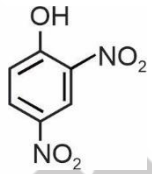
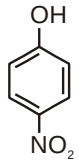
56. The electrophile involved in Reimer-Tiemann reaction is

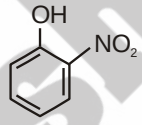
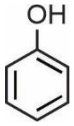
(1) $\overset{\oplus}{C}HCl_2$ (2) $:CCl_2$

(3) $\overset{\ominus}{C}Cl_3$ (4) $\overset{\oplus}{C}HO$

57. 

Identify X.

(1)  (2) 

(3)  (4) 

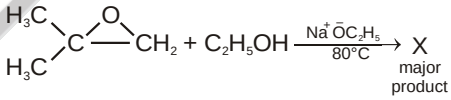
58. Which among the following will react fastest by S_N2 mechanism?

(1) $MeCH_2CH_2 - Br$

(2) $CH_3CH_2 - Br$

(3) $Me_2CH - CH_2 - Br$

(4) $Me_3C - CH_2 - Br$

59. 

The IUPAC name of X and the mechanism involved in the reaction respectively are

(1) 1-Ethoxy-2-methylpropan-2-ol and S_N1

(2) 2-Methoxy-1-methylpropan-1-ol and S_N2

(3) 1-Ethoxy-2-methylpropan-2-ol and S_N2

(4) 2-Methoxy-1-methylpropan-2-ol and S_N1

60. Number of optically active isomers of 2, 3-dibromopentane are

(1) 4 (2) 3

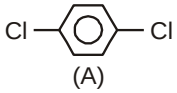
(3) 2 (4) 5

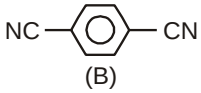
61. Grignard reagent produces alkane if reacts with

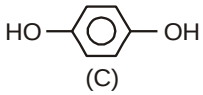
(1) Phenol (2) Carboxylic acid

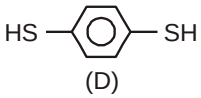
(3) Amine (4) All of these

62. For which of the following molecules μ(Dipole moment) is/are non-zero?


(A)


(B)


(C)


(D)

(1) Only (A) (2) Both (A) & (B)

(3) Only (C) (4) Both (C) & (D)

63. HBr reacts fastest with

(1) 2-methyl propan-2-ol

(2) Propan-2-ol

(3) Propanol

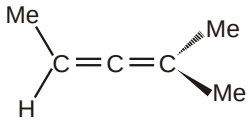
(4) 2-methyl propan-1-ol

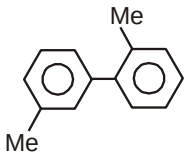
64. Which of the following has the highest nucleophilicity?

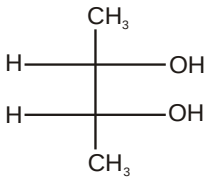
(1) F^- (2) OH^-

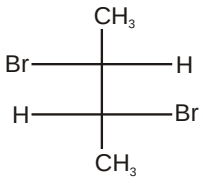
(3) CH_3^- (4) NH_2^-

65. The compound which is optically active, is

(1) 

(2) 

(3) 

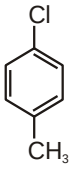
(4) 

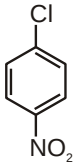
66. Which among the following will give yellow precipitate with aqueous $AgNO_3$ solution at room temperature?

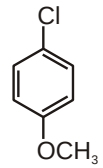
(1) Tert-butyl chloride (2) Tert-butyl iodide

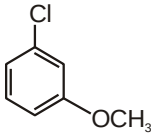
(3) Chlorobenzene (4) Iodobenzene

67. Which of the following aromatic compounds undergoes nucleophilic substitution reaction most easily?

(1) 

(2) 

(3) 

(4) 

68. Correct order of nucleophilicity is

(1) $H_2O > \overset{\ominus}{O}H > CH_3COO^{\ominus}$

(2) $\overset{\ominus}{O}H > CH_3COO^{\ominus} > H_2O$

(3) $CH_3COO^{\ominus} > \overset{\ominus}{O}H > H_2O$

(4) $\overset{\ominus}{O}H > H_2O > CH_3COO^{\ominus}$

69. Which of the following hydrocarbon is most acidic when reacts with RMgX?

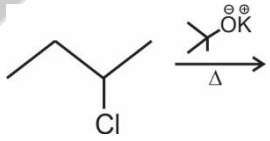
(1) 

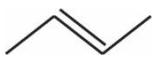
(2) 

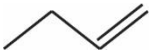
(3) 

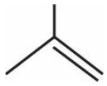
(4) 

70. Find the major product of the following reaction



(1) 

(2) 

(3) 

(4) 

71. $CH_3 - CH = CH_2 + HOBr \rightarrow P$. The major product P is

(1) $CH_3 - \underset{Br}{CH} - \underset{OH}{CH_2}$

(2) $CH_3 - \underset{OH}{CH} - \underset{Br}{CH_2}$

(3) $\underset{Br}{CH_2} - CH_2 - \underset{OH}{CH_2}$

(4) $CH_3 - \underset{OH}{\overset{Br}{C}} - CH_3$

72. Which of the following inorganic fluoride can be used to prepare alkyl fluoride from corresponding chloroalkane?

(1) HF (2) ClF_3

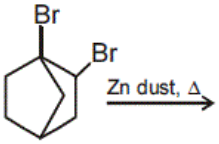
(3) BrF_3 (4) Hg_2F_2

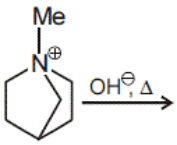
73. Total number of optically active isomers of tartaric acid is

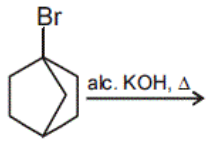
(1) 4 (2) 3

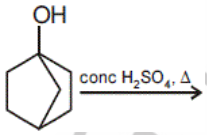
(3) 2 (4) 1

74. Which of the following reaction will undergo an elimination reaction and an alkene will be formed as the product?

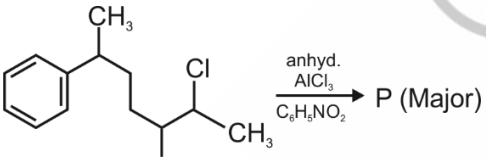
(1) 

(2) 

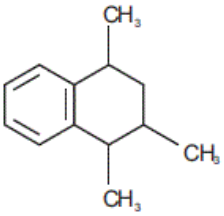
(3) 

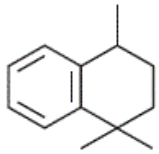
(4) 

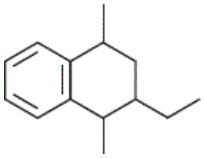
75. Consider the following electrophilic aromatic substitution.

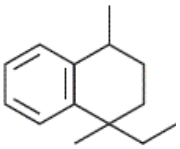


The Product P is

(1) 

(2) 

(3) 

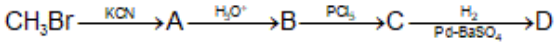
(4) 

76. Ethylene oxide when treated with phenyl magnesium bromide followed by hydrolysis yields

(1) Benzene (2) Ethylene

(3) 2-ethylphenol (4) 2-phenylethanol

77. In the following sequence of reaction



The end product (D) is

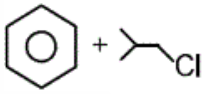
(1) CH_3CH_2OH (2) CH_3CHO

(3) CH_3CH_3 (4) CH_3OCH_3

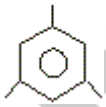
78. Ambident nucleophile among the following is

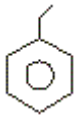
(1) Nitrite ion (2) Chloride ion

(3) Carbonate ion (4) Hydroxide ion

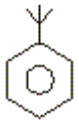
79. 

product is

(1) 

(2) 

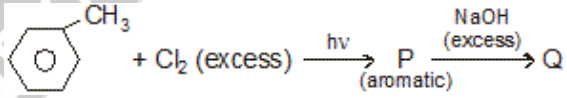
(3) 

(4) 

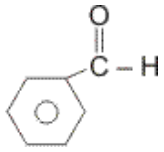
80. Ph—CH_2—MgBr on reaction with H_2O produces

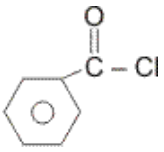
(1) Ph—CH_2—OH (2) Ph—CH_3

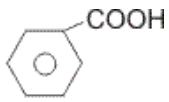
(3) PhH (4) Ph—OH

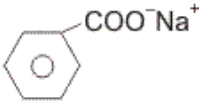
81. 

Compound Q is

(1) 

(2) 

(3) 

(4) 

82. When 2-bromobutane is heated with alcoholic KOH, the major product formed is

(1) 1-butene (2) 2-butene

(3) 1,3-butadiene (4) 2-butanol

83. Electrophile in Friedel-Crafts alkylation of benzene is

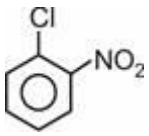
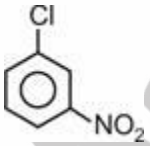
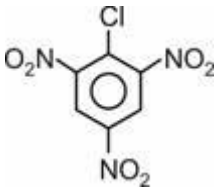
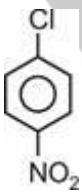
(1) SO_3 (2) $CH_3\overset{+}{C}O$

(3) $\overset{+}{Cl}$ (4) CH_3^+

84. $CH_3COOAg + Br_2 \xrightarrow{CCl_4} CH_3Br + AgBr + CO_2$
Above reaction is known as
(1) Hunsdiecker reaction
(2) Darzen's method
(3) Finkelstein reaction
(4) Wurtz reaction

85. The major product (A) of the following reaction is
$CH_3—CH=CH_2 \xrightarrow[\text{Peroxide}]{HBr} (A)$
(1) $CH_3—CH_2—CH_2—Br$
(2) $CH_3\underset{\displaystyle Br}{\underset{|}{C}}H—CH_3$
(3) $CH_3—\underset{\displaystyle Br}{\underset{|}{CH}}—\underset{\displaystyle Br}{\underset{|}{CH_2}}$
(4) $CH_3—\underset{\displaystyle Br}{\underset{|}{\overset{\displaystyle Br}{\overset{|}{C}}}}—CH_3$

SECTION – B

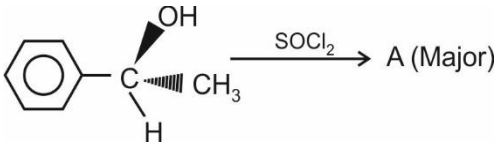
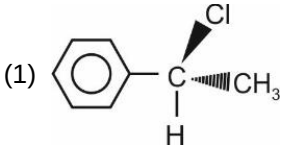
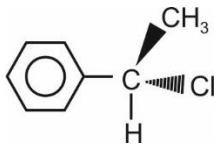
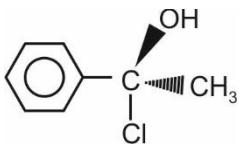
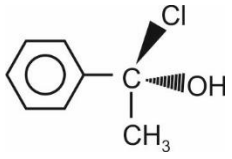
86. Out of following compounds which one will undergo nucleophilic substitution reaction fastest?
(1) 
(2) 
(3) 
(4) 

87. $CH_3—\underset{\displaystyle CH_3}{\underset{|}{\overset{\displaystyle CH_3}{\overset{|}{C}}}}—CH_2—Br \xrightarrow[\Delta]{\text{alc.KOH}} X$; X is
(1) $CH_3—\underset{\displaystyle CH_3}{\underset{|}{\overset{\displaystyle CH_3}{\overset{|}{C}}}}—CH_2—OH$
(2) $CH_3—\overset{\displaystyle CH_3}{\overset{|}{C}}=CH—CH_3$
(3) $CH_3—\underset{\displaystyle OH}{\underset{|}{\overset{\displaystyle CH_3}{\overset{|}{C}}}}—CH_2—CH_3$
(4) $CH_3—\underset{\displaystyle OH}{\underset{|}{CH}}—\overset{\displaystyle CH_3}{\overset{|}{CH}}—CH_3$

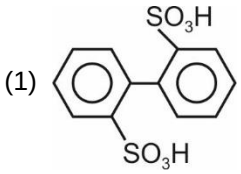
88. Consider the following reactions.
R_1 : $CH_3—\underset{\displaystyle Br}{\underset{|}{CH}}—\underset{\displaystyle Br}{\underset{|}{CH_2}} \xrightarrow[Et_2O]{Zn} P_1$
R_2 : $CH_3—\underset{\displaystyle I}{\underset{|}{CH}}—CH_3 \xrightarrow{\text{Alc. KOH}} P_2$
R_3 : $CH_3—\underset{\displaystyle OH}{\underset{|}{CH}}—CH_3 \xrightarrow[\Delta]{Conc.\ H_2SO_4} P_3$
Which of the following represents the relationship between P_1, P_2 and P_3?
(1) P_1 and P_2 are identical and P_3 is different
(2) P_1 and P_3 are identical and P_2 is different
(3) P_2 and P_3 are identical and P_1 is different
(4) All P_1, P_2 and P_3 are identical

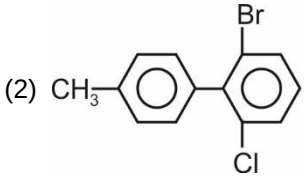
89. Tert-butyl chloride reacts with sodium ethoxide to give
(1) Alkane (2) Alkene
(3) Alkyl halide (4) Ether

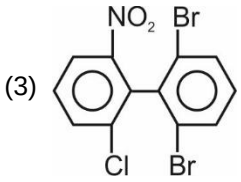
90. Among the following strongest nucleophile in vapour phase is
(1) F^- (2) Cl^-
(3) Br^- (4) I^-

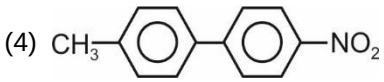
91. The major product (A) in the following reaction is

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

92. Optically active compound among the following is

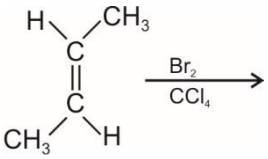
(1) 

(2) 

(3) 

(4) 

93. Total number of optically active compound(s) formed in the given reaction is/are



(1) 1 (2) 2

(3) 3 (4) 0

94. Chloroform reacts with aq. KOH to form which of the following compound?

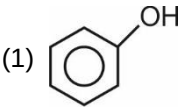
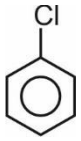
(1) Phosgene

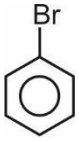
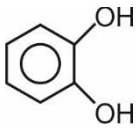
(2) Ethanol

(3) Acetaldehyde

(4) Potassium formate

95. Raschig process is used for the commercial preparation of

(1)  (2) 

(3)  (4) 

96. Minimum density among the following is of

(1) CH_3I (2) CH_3Br

(3) CH_3F (4) H_2O

97. In Groove's process, the reagent used is

(1) HCl in presence of anhy. $ZnCl_2$

(2) $SOCl_2$ in presence of pyridine

(3) NaBr in presence of conc. H_2SO_4

(4) KI in 95% H_3PO_4

98. The reactivity order of halogens towards ethane is

(1) $I_2 > Br_2 > Cl_2 > F_2$ (2) $F_2 > Cl_2 > Br_2 > I_2$

(3) $Cl_2 > Br_2 > F_2 > I_2$ (4) $Cl_2 > F_2 > Br_2 > I_2$

99. Peroxide effect is not observed in

(1) Propylene (2) Ethene

(3) Pent–1–ene (4) Isobutylene

100. Polar aprotic solvent(s) among the following is/are

(1) DMSO (2) Methanol

(3) Water (4) Both (1) and (2)

BOTANY

SECTION - A

101. The vital link between successive generations that ensures continuity of species from one generation to the next is

(1) Gamete (2) Zygote

(3) Embryo (4) Egg

102. Mark the **true** statement regarding gamete transfer.

(1) In a majority of organisms both female and male gametes are motile

(2) In bryophytes, pteridophytes and gymnosperms, water is the medium through which the gamete transfer takes place

(3) Transfer of pollen grains to the stigma is relatively easy in papaya than pea

(4) Successful transfer of gametes is essential for the most critical event of sexual reproduction

103. State **true** (T) or **false** (F) for the following statements and select the **correct** option

a. The ploidy level of gamete, embryo and endosperm in the angiosperms is n, 2n and 3n respectively

b. Both *Agave* and *Bryophyllum* vegetatively propagate by bulbils

c. *Strobilanthus kunthiana* is a monocarpic plant that flowers once in 12 years

d. The 'eyes' of *Solanum tuberosum* are floral buds

	a	b	c	d
(1)	T	F	T	T
(2)	T	F	T	F
(3)	F	T	T	T
(4)	T	F	F	T

104. **Statement A:** In some plants, where flowering occurs more than once, the interflowering period is called juvenile phase.

Statement B: Recovery phase is not the juvenile phase but is a part of the mature phase.

(1) Only statement A is correct

(2) Only statement B is correct

(3) Both the statements are correct

(4) Both the statements are incorrect

105. The anther wall layer(s) that perform(s) the function of protection is/are

a. Epidermis b. Endothecium

c. Middle layers d. Tapetum

(1) Only a (2) Only a and c

(3) All except c (4) All except d

106. Vegetative cell of pollen grains differs from its generative cell as the former

(1) Is bigger in size and has abundant food reserve

(2) Has a small irregularly shaped nucleus

(3) Is smaller in size and has dense cytoplasm

(4) Has spindle shaped nucleus

107. As the anther matures and dehydrates, the microspore tetrad dissociate and release

(1) Pollen sacs (2) Ovules

(3) Pollen grains (4) Male gametes

108. The coconut water

(1) Is free nuclear endosperm

(2) Contains only one nucleus

(3) Does not contain any nucleus

(4) Is cellular endosperm

109. Transfer of pollen grains from anther to the stigma of the flower of different plant of the same species is called

(1) Geitonogamy (2) Xenogamy

(3) Autogamy (4) Cleistogamy

110. Seeds that retain a part of endosperm as it is **not** completely used up during embryo development are found in all, **except**

(1) Wheat and maize (2) Wheat and castor

(3) Maize and castor (4) Pea and groundnut

111. What would be the number of chromosomes in the cells of scutellum and aleurone layer respectively of a maize seed, if it has eight chromosomes in its antipodal cell?

(1) 32 and 16 (2) 16 and 24

(3) 8 and 16 (4) 24 and 8

112. Parthenocarpy and apomixis are similar in lacking

(1) Fertilization (2) Embryo formation

(3) Fruit formation (4) Seed formation

113. Choose the statement which is **correct** about the post pollination events after the compatible pollination.

(1) Pollen grains germinate to produce pollen tube through one of its germ pores in anther

(2) If pollen grains are shed at three-celled stage, pollen tube carries two male gametes from the beginning

(3) Self incompatibility is necessary for self cross

(4) Generative cell divides through meiosis to form male gametes during the growth of pollen tube

114. Choose the **correct** match

(1) Coleoptile – Encloses radical and root cap

(2) Coleorhiza – Encloses epicotyl

(3) Aleurone layer – Proteinaceous in nature

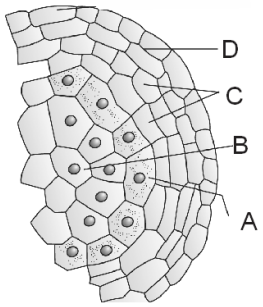
(4) Scutellum – Part of embryonal axis

115. Which of the following devices prevents autogamy as well as geitonogamy?
(1) Homogamy
(2) Dioecious condition
(3) Monoecious condition
(4) Cleistogamy

116. Which of the given is largest cell of embryo sac?
(1) Synergid (2) Egg
(3) Antipodal cells (4) Central cell

117. Female sex organ of *Chara*
(1) Is also called globule
(2) Has jacket composed of five tube cells
(3) Occupies lower position to male sex organs
(4) Is present at abaxial surface of short lateral branches

118. Which of the following parts of a typical anther is **correctly** matched with its functional or structural aspect?



(1) D – Site of microsporogenesis
(2) B – Ephemeral layer
(3) C – Polyploid and secretory layer
(4) A – Nutritive layer

119. Pollen allergy is/occurs
(1) Due to pollen grains of many hydrophilous plants
(2) Not associated with any kind of respiratory disorders
(3) Due to pollen grains of carrot grass, *Amaranthus* etc.
(4) Due to megaspores

120. Endosperm is a product of A and develops from B of embryo sac.
Select the option which **correctly** fills A and B.
(1) A-Syngamy, B- Central cell
(2) A-Triple fusion, B-Nucellus
(3) A-Syngamy, B-Nucellus
(4) A-Triple fusion, B-central cell

121. Identify the **incorrect** statement
(1) In aquatic plants such as water lily, the flowers are pollinated by insects
(2) Hydrophily takes place in *Salvia* and water hyacinth
(3) Sticky pollen grains and presence of nectaries are characteristics of the entomophilous plants
(4) Larger animals like lemur and tree dwelling rodents are reported as pollinators in some species

122. Which of the following is a form of asexual reproduction that mimics the sexual reproduction?
(1) Vegetative propagation
(2) Syngamy
(3) Triple fusion
(4) Apomixis

123. The monosporic embryo sac is
a. The most common embryo sac of angiosperms.
b. Formed by one meiosis in megaspore mother cell and only two sequential mitosis in functional megaspore.
(1) Only a is incorrect
(2) Only b is incorrect
(3) Both a and b are correct
(4) Both a and b are incorrect

124. In *Citrus* plants, many embryos are found in every seed. Some embryos are clones of each other which are **not** formed by
(1) Nucellus (2) Integument
(3) Zygote (4) Antipodals

125. Some plants produce both cleistogamous and chasmogamous flowers. Which of the following plant is **odd** one w.r.t above mentioned flowers?
(1) *Viola*
(2) *Oxalis*
(3) Rice
(4) *Commelina*

126. The tapetal cells of anther show increase in their DNA content due to all, **except**
(1) Endomitosis
(2) Restitution nucleus
(3) Polyteny
(4) Haploidy

127. All of the following are monoecious plants, **except**
(1) Cucurbit (2) Coconut
(3) Maize (4) Date palm

128. Mark the statement which is **not** correct for pollen grains.
(1) In majority of angiosperms, generative cell is absent in pollen grains at the time of dispersal
(2) Sporopollenin of pollen helps in its fossilization
(3) Pollen tablets can be used as food supplements
(4) Pollen grains can be stored at –196°C in pollen banks

129. How many of the following plants flower only once in their life?

Rice, Carrot, Mango, Apple, Jackfruit, China rose

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

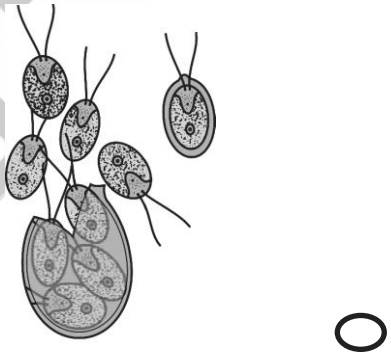
130. Syngamy refers to fusion of
(1) Male gamete with one polar nuclei
(2) Two fused polar nuclei with male gamete
(3) Egg with male gamete
(4) Two polar nuclei

131. The junction between ovule and funicle to the body of the ovule is called
(1) Micropyle (2) Chalaza
(3) Integument (4) Hilum

132. All of the following are **true** for diploid gamete mother cell, **except**
(1) It is a meiocyte
(2) Produces haploid gametes
(3) Undergoes meiosis
(4) Found in most algae and fungi

133. Plant in which roots bear adventitious bud is
(1) Potato
(2) *Opuntia*
(3) *Adiantum*
(4) *Dahlia*

134. Consider the given figure and select **correct** set of statements



a. Microscopic motile spores
b. Always formed in unfavourable conditions
c. Exogenously produced asexual spores
d. Pyramid shaped zoospores of *Chlamydomonas*
(1) a and c (2) b and d
(3) a and d (4) c and d

135. Choose the **incorrect** one for water hyacinth.
(1) Exotic weed introduced in Bengal for its beautiful flowers and shape of leaves
(2) Highly invasive aquatic weed found in running water
(3) It drains oxygen from the water
(4) It reproduces vegetatively by offsets

SECTION-B

136. Life span
(1) Is a specific trait of each organism
(2) Is always correlated to the size of an organism
(3) Is about 60 minutes in *E. coli*
(4) Of crow is more than that of parrot

137. Select the **correct** match w.r.t. plants and their vegetative propagules.
(1) Sucker – *Chrysanthemum*
(2) Bulbil – Onion
(3) Offset – Banana
(4) Leaf bud – Potato

138. Read the following statements carefully.
a. The most vital event of sexual reproduction is syngamy
b. In angiosperms, pollen transfer may occur through water
c. In most angiosperms, pollen grains are the carriers of motile male gametes
d. Stigma serves as a landing platform for pollen grains after pollination

Correct statements are
(1) a and c (2) b and d only
(3) a, b and d (4) All a, b, c and d

139. Which of the given structures/modes of reproduction does **not** produce genetically similar individuals?
(1) Fragmentation in *Hydra*
(2) Fusion of isogametes of *Rhizopus*
(3) Binary fission in diatoms
(4) Foliar buds of *Bryophyllum*

140. The common features between *Chara* and *Marchantia* are
(a) Mainly dioecious plant body
(b) Flagellated antherozoids
(c) Jacketed sex organs
(d) Protandrus condition
(e) Female sex organ is oogonium
(1) Only (a), (b) and (c) (2) Only (b) and (c)
(3) Only (a) and (e) (4) Only (b), (c) and (d)

141. Which of the given plants prevents autogamy but **not** geitonogamy?
(1) Castor (2) Papaya
(3) Maize (4) Both (1) and (3)

142. Pollen viability
(1) Is period for which the pollen grains retain the ability to germinate on stigma in most gymnospermic plants
(2) Is highly variable and depends on prevailing temperature and humidity
(3) For plants of leguminosae, rosaceae and solanaceae family it is of 30 minutes
(4) Is several months for plants like rice and wheat

143. The pore or passage present at the tip of ovule where the integument is absent is called
(1) Funicle (2) Micropyle
(3) Hilum (4) Nucellus

144. External fertilization is found in all, **except**
(1) Majority of algae
(2) Amphibians
(3) Flowering plants
(4) Fishes

145. Which of the given features is **not** associated with nucellus?
(1) Has parenchymatous mass of tissues
(2) Stores the reserve food
(3) Forms the body of the ovule
(4) Is the protective envelope of the ovule

146. A typical angiospermic anther is
(a) Bilobed (b) Dithecous
(c) Tetragonal (d) Tetrasporangiate
(1) Only (a), (b) and (d)
(2) All (a), (b), (c) and (d)
(3) Only (a) and (d)
(4) Only (b) and (d)

147. If a typical angiospermic anther has 25 microspore mother cells in its each sporangium calculate the total number of microspore tetrads, pollen grains and male gametes respectively produced by this anther.
(1) 25, 100, 200 (2) 100, 400, 800
(3) 100, 100, 400 (4) 50, 200, 400

148. Read the following statements and choose the **correct** option.

A. Generative cell in a mature pollen grain is spindle shaped which floats in the cytoplasm of the vegetative cell.

B. In 40% of the angiosperms, pollen grains are shed at two-celled stage.

(1) Both the statements are correct

(2) Only statement A is incorrect

(3) Only statement B is incorrect

(4) Both the statements are incorrect

149. How many meiotic divisions are required to produce 80 seeds in a typical angospermic plant?

(1) 80 (2) 100

(3) 40 (4) 20

150. Mark the **odd** one w.r.t. the post fertilisation events occurring in a flowering plant.

(1) Embryo formation

(2) Ovule develops into a seed

(3) Gametogenesis

(4) Ovary ripens into a fruit

ZOOLOGY

SECTION - A

151. Which one of the following options includes diploid cells?

(1) Spermatogonia, primary spermatocyte, oogonia, ovum

(2) Spermatogonia, primary spermatocyte, secondary oocyte, sperm

(3) Spermatogonia, primary spermatocyte, primary oocyte, oogonia

(4) Oogonia, spermatogonia, secondary spermatocyte, ovum

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

	Column-I		**Column-II**
a.	Leydig cell	(i)	Sperms are temporarily stored and matured here
b.	Prepuce	(ii)	Yellow body
c.	Corpus	(iii)	Secretes androgens
d.	Epididymis	(iv)	Skin covering the glans penis

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

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

153. Gamete transfer occurs during

(1) Pre-fertilization event

(2) Fertilization event

(3) Gametogenesis

(4) Embryogenesis

154. Mucous plug is formed in cervix during pregnancy under the influence of hormone

(1) Estrogen

(2) Progesterone

(3) LH

(4) Estrogen and progesterone

155. Enzyme that is responsible for dissolving the hyaluronic acid cementing the granulosa cells is

(1) Hyaluronidase

(2) Corona penetrating enzyme

(3) Acrosin

(4) Zona lysin

156. Read the given statements and choose the option which assign them as true**(T) or** false**(F)** correctly.

The adipose tissue is found between the lobes and covers the surface of the mammary glands.

Day of ovulation is 24th in a woman whose menstrual cycle is of 48 days.

Layer of theca cells makes its earliest appearance at secondary follicle.

Mammary glands are apocrine, endocrine glands, whose alveoli synthesize milk under increased levels of progesterone during pregnancy.

	a	**b**	**c**	**d**
(1)	T	T	F	F
(2)	T	F	T	F
(3)	F	F	F	T
(4)	F	T	T	F

157. Event **not** associated with follicular phase of ovary is
(1) Rise in level of gonadotrophin FSH
(2) Repair of endometrial lining in uterus
(3) Positive feedback by estrogen in later part of this phase to increase LH levels
(4) Release of inhibin by granulosa cells

158. Select a feature or function **not** applicable to placenta or umbilical cord.
(1) Placenta acts as an ultra filter and foetal lung.
(2) Permits movement of antibodies such as IgG from foetal to maternal circulation
(3) All the blood vessels in umbilical cord carry 100% foetal blood only.
(4) Placenta acts as temporary endocrine gland.

159. Hormones released exclusively in a pregnant female include
(1) Estrogen, Progesterone, hCS, hPL
(2) hCG, hCS / hPL, Relaxin
(3) Thyroxine, Cortisol, Oxytocin, hCG
(4) Inhibin, hCG, hPL, Prolactin

160. Choose the **odd** one w.r.t. male reproductive system
(1) Bartholin's gland
(2) Prostate gland
(3) Bulbourethral gland
(4) Cowper's gland

161. Which of the following is an extra embryonic membrane that acts as shock absorber and prevents desiccation of human embryo?
(1) Chorion (2) Amnion
(3) Trophoblast (4) Allantois

162. Changes in ovary leading to ovarian cycle in primates results from hormones primarily secreted by
(1) Neurohypophysis (2) Placenta
(3) Posterior pituitary (4) Anterior pituitary

163. Non-cellular layer made up of glycoproteins within Graafian follicle around ovum which prevents ectopic pregnancy is
(1) Corona radiata (2) Granulosa
(3) Zona pellucida (4) Theca externa

164. Meiosis I in female gametogenesis is completed in
(1) Primary oocyte in Graafian follicle
(2) Secondary oocyte in Graafian follicle
(3) Primary oocyte in tertiary follicle
(4) Secondary oocyte in secondary follicle

165. Activation of sperms in female genital tract to facilitate fertilisation is known as
(1) Insemination (2) Acrosomal reaction
(3) Capacitation (4) Spermiation

166. Milk ejecting hormone in a lactating mother is
(1) Prolactin (2) Oxytocin
(3) Progesterone (4) Estrogen

167. In a nonpregnant female, regression of corpus luteum occurs due to fall in level of
(1) Progesterone (2) Estrogen
(3) hCG (4) LH

168. Which of the following hormones is **not** secreted by placenta?
(1) Chorionic somatomammotropin
(2) Chorionic thyrotropin
(3) Human chorionic gonadotropin
(4) Cortisol

169. Select the **odd one** w.r.t female external genitalia.
(1) Labia minora (2) Labia majora
(3) Hymen (4) Cervix

170. Consider the following statements about male reproductive system with certain blanks A, B, C and D. Choose the option which **correctly** fill up these blanks.
(i) The scrotum in man helps in maintaining the temperature of testes __A__ lower than normal internal body temperature for normal spermatogenesis.
(ii) The normal length of human testis is about __B__ .
(iii) Each testis has about __C__ testicular lobules.
(iv) Each testicular lobule contains __D__ highly coiled seminiferous tubules.

	A	B	C	D
(1)	2-2.5°C	2-3 cm	250	1-3
(2)	2-2.5°C	4-5 cm	250	1-3
(3)	3.5°C	4-5 cm	300	1-3
(4)	3.5°C	2-3 cm	250	1-3

171. Select the **correct** pair of animals reproducing through transverse binary fission.
(1) *Planaria* and *Hydra*
(2) *Amoeba* and *Paramecium*
(3) *Euglena* and Yeast
(4) *Paramecium* and *Planaria*

172. A narrow region, called isthmus is a part of which of the following structures?
(1) Mammary gland (2) Fallopian tube
(3) Vas deferens (4) Testis

173. Choose the **odd** one w.r.t. number.
(1) Seminal vesicle (2) Prostate gland
(3) Cowper's gland (4) Bartholin's gland

174. Select the **odd** one w.r.t. sexuality of organism.
(1) Cockroach (2) Earthworm
(3) Leech (4) Tapeworm

175. Maximum life span is a characteristic of __A__ and life expectancy is the characteristic of a __B__. Select the option which fill the blanks **correctly**.
(1) A-Species, B-Population
(2) A-Population, B-Species
(3) A-Genus, B-Class
(4) A-Class, B-Genus

176. The organisms which are considered as immortal is/are
(1) *Amoeba* only
(2) All unicellular organisms
(3) *Apis*
(4) *Periplaneta*

177. Genetic constitution of (22 + Y) is found in
(1) Primary spermatocyte
(2) Spermatozoa
(3) Primary oocyte
(4) Ootid

178. Choose the **correct** sequence w.r.t. embryonic stages in humans.
(1) Blastocyst → Gastrula → Morula
(2) Gastrula → Blastocyst → Morula
(3) Morula → Blastocyst → Gastrula
(4) Gastrula → Morula → Blastocyst

179. Choose the **incorrect** match.
(1) Bulbourethral gland – Lubrication of penis
(2) Urethral meatus – External opening of penis
(3) Uterus – Known as womb
(4) Sertoli cells – Secrete androgens

180. Select the **mismatch** between the type of cells given in Column-I and its corresponding characters/ functions in Column-II.

	Column-I	Column-II
(1)	Interstitial cells	– Source of testosterone
(2)	Sertoli cells	– Secrete androgen binding protein
(3)	Spermatids	– Haploid
(4)	First polar body	– Formed at birth of baby

181. Select the **correct** sequence of reproductive events in humans.
(1) Fertilization → Insemination → Gestation → Parturition
(2) Insemination → Gestation → Implantation → Parturition
(3) Gametogenesis → Fertilization → Implantation → Parturition
(4) Gametogenesis → Implantation → Insemination → gestation

182. In majority of sexually reproducing organisms, the gametes produced are of morphologically two distinct types.
They don't differ generally on the basis of
(1) Motility
(2) Size
(3) Chromosome number
(4) Amount of cytoplasm

183. Among the following, multiple fission is seen in all **except**
(1) *Amoeba* (2) *Paramoecium*
(3) *Monocystis* (4) *Plasmodium*

184. Sexual reproduction in animals
(1) Can be uniparental or biparental
(2) Ensures rapid multiplication as it's a faster process
(3) Occurs only under favourable conditions
(4) Requires formation of gametes but never gamete fusion

185. Select the **correct** match between column-I and column-II. All data given is in context of animals.

	Column-I	**Column-II**
(1)	Cell differentiation	– Involves differential expression of genes that gives rise to different cell types though all cells in an animal contain the same DNA
(2)	Drones	– Males in honey bee produce sperms meiotically
(3)	Zygote	– Vital connecting link between members of two generations resulting from both asexual and sexual reproduction
(4)	Gemmule formation	– Method of reproduction in *Spongilla* where each archaeocyte of a gemmule can give rise to a new sponge upon return of favourable conditions

SECTION - B

186. Select the statement/feature that is **incorrect** w.r.t external fertilisation.
(1) Gamete formation and fusion occurs in water
(2) Organisms that undergo fertilisation in external medium are generally anamniotes among vertebrates
(3) Simultaneous release of gametes by male and female increases chances of zygote formation
(4) Disadvantage involved is susceptibility of gametes to predators and natural calamities

187. Chromosome number in a gamete of *Drosophila* is 4. What is the chromosome number in meiocytes of *Musca*?
(1) 8 (2) 12
(3) 6 (4) 24

188. 140 years is approximate life span of a
(1) Butterfly (2) Crocodile
(3) Fruit fly (4) Parrot

189. During embryogenesis, a human zygote undergoes
(1) Mitosis and meiosis
(2) Mitosis and cell differentiation
(3) Meiosis and cell differentiation
(4) Reductional division and cell differentiation

190. Choose the **incorrect** match:

	Column I (Organism)	**Column II (Chromosome number in meiocyte)**
(1)	Dog	78
(2)	Butterfly	380
(3)	Cat	36
(4)	Fruit fly	8

191. Which of the following is a monoecious organism?
(1) Schistosoma (2) Pheretima
(3) Ancylostoma (4) Bombyx

192. Read the following statements and choose the **correct** statement.
(1) Reproductive phase is of same duration in all living organisms
(2) Sexual reproduction always involves the formation of male and female gametes by different individuals of opposite sex
(3) All birds living in nature lay eggs throughout the year
(4) Humans are reproductively active throughout their reproductive phase, hence are called continuous breeders

193. Sexual reproduction in comparison to asexual reproduction is a
(1) Simple process
(2) Fast process
(3) Slow and simple process
(4) Complex and slow process

194. In which of the following organisms cell division itself is a mode of reproduction?
(1) *Amoeba* (2) *Asterias*
(3) *Aurelia* (4) *Ascaris*

195. The period from birth to natural death of an organism represents its
(1) Life expectancy (2) Life span
(3) Reproductive period (4) Mortality

196. **Correct** sequence of anatomical structures of human male reproductive system is
(1) Seminiferous tubules → tubuli recti → rete-testis → vas efferentia → epididymis → vas deferens
(2) Seminiferous tubules → rete-testis → tubuli-recti → vas efferentia → epididymis → vas deferens
(3) Seminiferous tubules → epididymis → vas efferentia → rete-testis → tubuli recti
(4) Tubuli recti → seminiferous tubules → rete-testis → epididymis → vas deferens → vas efferentia

197. Secretion of which of the following gland forms maximum part of semen?
(1) Prostate gland
(2) Cowper's glands
(3) Seminal vesicles
(4) Bulbourethral glands

198. All the statements are incorrect about a human sperm **except**
(1) Mitochondria are present in the neck region
(2) Nucleus is present in middle piece
(3) Acrosome is present in head region of sperm outside plasma membrane
(4) For normal fertility, at least 72 million sperms from a single ejaculate must have normal shape and size and must show vigorous motility

199. The ducts which open into nipple of a mammary gland are
(1) Mammary tubules (2) Lactiferous ducts
(3) Mammary ducts (4) Alveolar duct

200. The cell which first enters in meiosis during spermatogenesis is
(1) Spermatogonia
(2) Primary spermatocyte
(3) Secondary spermatocyte
(4) Spermatid

❑ ❑ ❑