12-04-2019

Code - B

Aakash
Medical | IIT-JEE | Foundations
(Divisions of Aakash Educational Services Limited)
Regd. Office **:** Aakash Tower, 8, Pusa Road, New Delhi-110005; Ph.: 011-47623456

MM : 720

Test Series for NEET - 2019
Test – 7

Time : 3 Hrs.

Topics Covered :

Physics : Current Electricity, Moving charges and magnetism.

Chemistry : General Principles and Processes of Isolation of Elements, *p*-Block Elements (Group 15-18), *d* and *f* Block Elements, Coordination Compounds.

Botany : Principles of Inheritance and variation, Molecular Basis of Inheritance.

Zoology : Evolution.

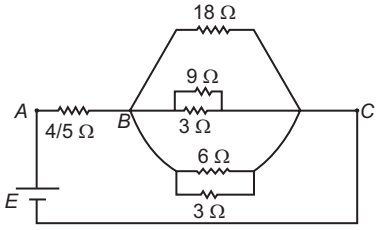
Instructions :

(i) Use Blue/Black ballpoint pen only to darken the appropriate circle.
(ii) Mark should be dark and should completely fill the circle.
(iii) Dark only one circle for each entry.
(iv) Dark the circle in the space provided only.
(v) Rough work must not be done on the Answer sheet and do not use **white-fluid** or any other **rubbing material** on Answer sheet.
(vi) Each question carries 4 marks. For every wrong response 1 mark shall be deducted from total score.

PHYSICS

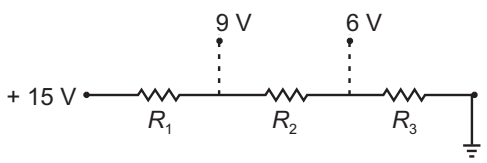
Choose the correct answer :

1. In the circuit as shown in figure, if a battery is connected between points *A* and *C* of e.m.f *E* 18 V, then current flowing through the battery is



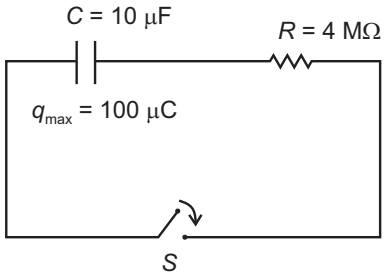
(1) 15 A (2) 5 A
(3) 20 A (4) 10 A

2. A potential divider is used to give outputs of 6 V and 9 V from a 15 V source as shown in figure. The value of R_1, R_2 and R_3 may be respectively



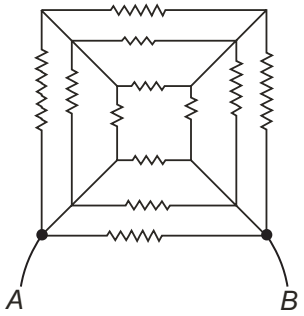
(1) 1 kΩ, 2 kΩ and 3 kΩ
(2) 100 Ω, 100 Ω and 300 Ω
(3) 200 Ω, 100 Ω and 200 Ω
(4) 10 Ω, 20 Ω and 30 Ω

3. For the arrangement shown in the figure, the switch is closed at t = 0. The time after which current becomes 1.25 μA is given by ($\log_e 2 \approx 0.7$)



(1) 25 s
(2) 30 s
(3) 28 s
(4) 20 s

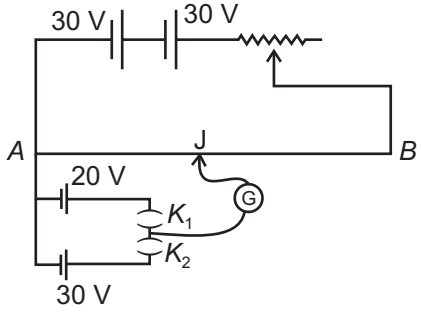
4. Twelve resistors each of resistance 12 Ω are connected in the circuit as shown in the figure. The net resistance between points *AB* is



(1) 4 Ω (2) 3 Ω

(3) 2 Ω (4) 1 Ω

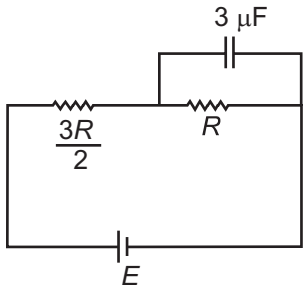
5. The circuit as shown in figure is used to compare the emf of two cells of 20 V and 30 V. The null point is at point J when galvanometer is connected to 20 V battery. When the galvanometer is connected to 30 V battery, the null point will be



(1) Left of J (2) Right of J

(3) At J itself (4) Nowhere on wire *AB*

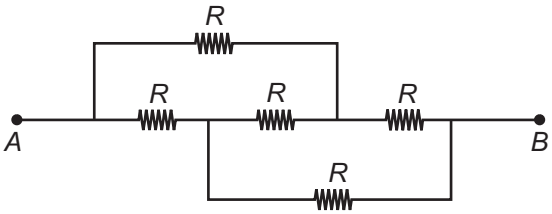
6. In the circuit as shown in the figure, the maximum energy stored in capacitor is 0.216 mJ. Then emf of the cell is



(1) 30 V (2) 20 V

(3) 10 V (4) 40 V

7. The effective resistance between *A* and *B* will be



(1) 2 R (2) 3 R

(3) R (4) 6 R

8. If length of a conducting wire is made to four times of initial length by drawing it, then its resistivity will

(1) Increase by 4 times

(2) Increase by 16 times

(3) Remain same

(4) Decrease by 4 times

9. If a copper wire is stretched to make it 0.1% longer, then resistance is (Assuming density to be constant)

(1) Increased by 0.1% (2) Increased by 0.2%

(3) Decreased by 0.1% (4) Decreased by 0.2%

10. The current i in a wire depends on time as $i = i_0 + 3\alpha t$, where i_0 = 0.5 A and α = 0.04 A s^{-1}. The total charge crossed through a cross-section of the wire in first 10 s is

(1) Zero (2) 11 C

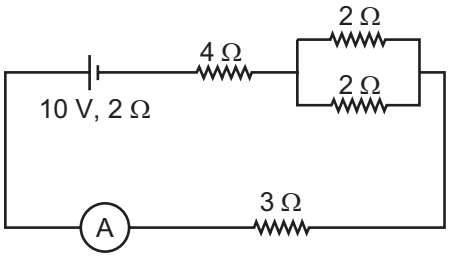
(3) 5.6 C (4) 56 C

11. Current flowing in a wire varies with time as $i = (2 + t)$A. The average current flown through the wire in first 4 s will be

(1) 2 A (2) 4 A

(3) 6 A (4) 8 A

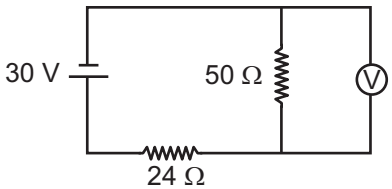
12. The current passing through the ideal ammeter in the circuit as shown in figure is



(1) 1.0 A (2) 0.5 A

(3) 1.25 A (4) 1.5 A

13. The voltmeter shown in figure reads 18 V across 50 ohm resistor. The resistance of voltmeter is nearly



(1) 140 Ω (2) 128.5 Ω

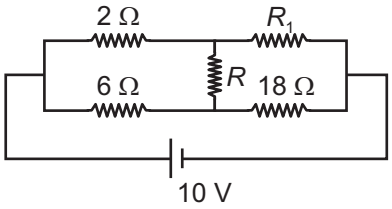
(3) 103 Ω (4) 162 Ω

14. The maximum power that can be generated in an external resistor by a cell of emf 10 V and internal resistance 2 Ω is

(1) 25 W (2) 12.5 W

(3) 50 W (4) Zero

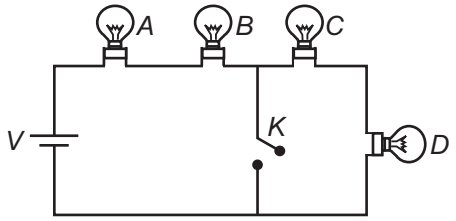
15. What could be value of R_1 for which current through R is zero?



(1) 4 Ω (2) 40 Ω

(3) 10 Ω (4) 6 Ω

16. Four identical bulbs each of rated power P and voltage V are connected as shown in figure. Now after the key K is closed then incandescence of bulb A will



(1) Increase (2) Decrease

(3) Become zero (4) Remain same

17. An ammeter is to be constructed to read current up to 2.0 A. If the coil has a resistance of 25 Ω and takes 1 mA for full scale deflection, what should be resistance of the shunt used?

(1) 0.25 Ω (2) 1 Ω

(3) 1.25×10^{-2} Ω (4) 1.25 Ω

18. Nine cells, each of emf ε and internal resistance r, are connected in series to form a loop. If one cell is connected wrongly, then potential difference across this cell will be

(1) $\frac{16}{9}\varepsilon$ (2) Zero

(3) $\frac{17}{9}\varepsilon$ (4) $\frac{8}{9}\varepsilon$

19. The ratio of maximum and minimum resistance that can be obtained by using three resistance of 20 Ω, 50 Ω and 100 Ω is

(1) $\frac{13}{5}$ (2) $\frac{68}{5}$

(3) $\frac{34}{5}$ (4) $\frac{17}{5}$

20. Consider a current carrying wire in the shape of a circle. As the current progresses along the wire, the direction of $\vec{j}$ changes in an exact manner, while the current remain unaffected. The agent that is essentially responsible for is

(1) Source of emf

(2) The charges just behind a given segment of wire which push charges in the right way

(3) The electric field produced by charges accumulated on the surface of wire

(4) Both (1) and (2)

21. A resistance "R" is to be measured using a meter bridge. Student choose the standard resistance S to be 300 Ω. He finds the null point at ℓ = 3 cm. He is told to attempt to improve the accuracy, which of the following is a usual way?

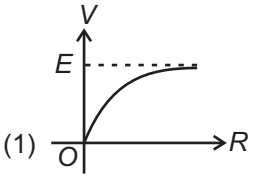
(1) He should measure ℓ_1 more accurately

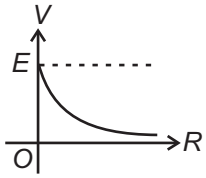
(2) He should change S to 900 Ω and repeat the experiment

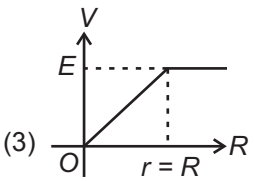
(3) He should change S to 9 Ω and repeat the experiment

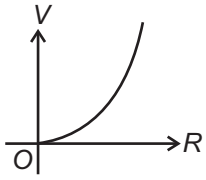
(4) He should give up hope of a more accurate measurement

22. A cell of emf E and internal resistance r is connected across an external resistance "R". The graph showing the variation of P.D (across R) versus R is best represented by

(1) 

(2) 

(3) 

(4) 

23. Let $\vec{J}$ is the current density at a point in a conductor and $\vec{E}$ the electric field there. If n be the number density of charge carriers, e the charge on them, m is their mass, τ the relaxation time. Then $\vec{J}$ is equal to

(1) $\frac{ne^2}{2m\tau}\vec{E}$

(2) $\frac{ne^2}{m\tau}\vec{E}$

(3) $\frac{ne^2\tau}{m}\vec{E}$

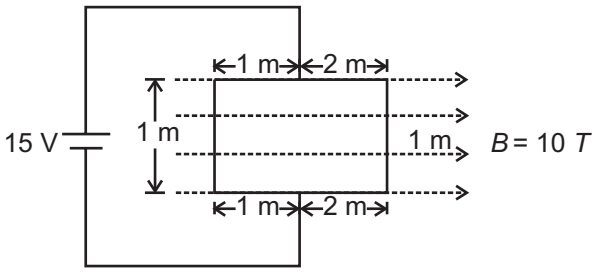
(4) $\frac{n\tau\vec{E}}{me^2}$

24. A uniform conducting wire of length 18 ℓ and carring current i is wound up as a current coil as regular hexagon of side "ℓ". Then magnetic moment of the coil is

(1) $\frac{9\sqrt{3}}{2} i\ell^2$ (2) $\frac{\sqrt{3}}{2} i\ell^2$

(3) 4.5 $i\ell^2$ (4) $3i\ell^2$

25. A rectangular loop is connected to a battery as shown in figure. If resistance of 1 m wire of the loop is 1 Ω then magnitude of net force acting on the loop will be



(1) 20 N (2) 60 N

(3) 50 N (4) 40 N

26. The gyromagnetic ratio of an electron in an H-atom, according to Bohr model is

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

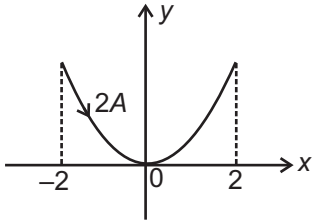
(3) $\frac{2e}{m}$ (4) $\frac{e}{4m}$

27. A uniform of length 100 cm carries a steady current i. The potentials at the ends of the wire is –6 V and +24 V as shown in figure. The value of potential at P is

(1) – 0.6 V (2) – 0.4 V

(3) 5.4 V (4) – 5.4 V

28. A wire of mass 100 g is carrying a current of 2 A in the form of $y = x^2$ ($-2 \le x \le 2$). The wire is placed in a magnetic field $\vec{B} = -0.02\hat{k}$ T. The acceleration of wire in (m/s^2) is (Neglect gravity and x and y are in metre)



(1) $-1.6\,\hat{j}$ (2) $-3.2\,\hat{j}$

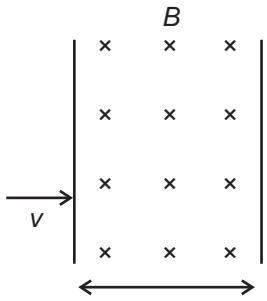
(3) $1.6\,\hat{j}$ (4) Zero

29. Two charged particles having same linear momentum describe circular paths of radius R_1 and R_2 respectively in uniform transverse magnetic field. If the ratio of their respective charges is 1 : 3, then the ratio of R_1 and R_2 will be

(1) 1 : 3 (2) 3 : 1

(3) 1 : 9 (4) 9 : 1

30. A particle having charge q and mass m, enters a uniform magnetic field B as shown. The displacement of the particle in the field is



$d = \frac{\sqrt{3}}{2}\frac{mv}{qB}$

(1) $\frac{mv}{2qB}$ (2) $\frac{mv}{qB}$

(3) $\frac{\sqrt{3}mv}{2qB}$ (4) $\frac{2}{\sqrt{3}}\frac{mv}{qB}$

31. A uniform electric field and magnetic field exists in the same direction. An electron is projected with a velocity pointed in same direction. Then electron will

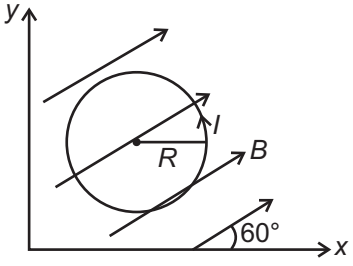
(1) Be deflected to its right without increasing speed

(2) Be deflected to its right with increasing speed

(3) Not be deflected but speed will initially decrease

(4) Not be deflected but speed will initially increase

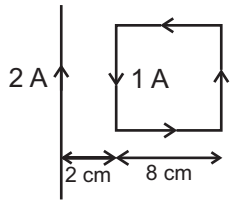
32. The magnitude of torque acting due to the magnetic field existing in xy plane on current carrying loop on xy plane shown in the figure is (where symbols have their usual meanings)



(1) $\frac{I\pi R^2 B}{2}$ (2) $\frac{I\pi R^2 B\sqrt{3}}{2}$

(3) $I\pi R^2 B$ (4) Zero

33. A long straight current carrying wire is placed in horizontal plane near a square loop carrying a current of 1 A as shown in figure. The net force on the loop is



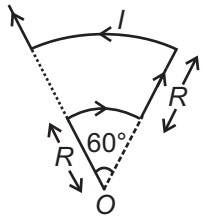
(1) 1.28×10^{-5} N, attractive

(2) 1.28×10^{-6} N, repulsive

(3) 1.92×10^{-5} N, attractive

(4) Zero

34. The magnetic field at the centre(O) of a current carrying wire as shown in the figure is



(1) $\frac{\mu_0 I}{24R}$ into the plane

(2) $\frac{\mu_0 I}{24R}$ out of the plane

(3) $\frac{\mu_0 I}{12R}$ into the plane

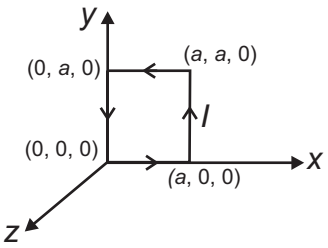
(4) $\frac{\mu_0 I}{12R}$ out of the plane

35. A current carrying closed loop is placed in a plane of uniform magnetic field B. If F and τ are the net force and net torque acting on the loop, then which of the following is correct?

(1) $F = 0, \tau = 0$ (2) $F = 0, \tau \neq 0$

(3) $F \neq 0, \tau = 0$ (4) $F \neq 0, \tau \neq 0$

36. The magnetic moment of a current carrying loop carrying current I as shown in figure, is



(1) $\sqrt{2}\, Ia^2 \hat{k}$ (2) $Ia^2 \hat{k}$

(3) $\frac{Ia^2}{\sqrt{2}} \hat{k}$ (4) $2Ia^2 \hat{k}$

37. A circular wire of radius r carries a current i. If the magnitude of magnetic field at the center is B, then the value of i is

(1) $\frac{2\pi Br}{\mu_0}$ (2) $\frac{Br}{\mu_0}$

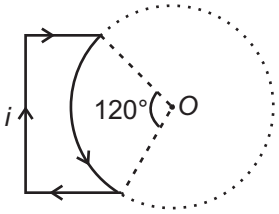
(3) $\frac{\pi Br}{\mu_0}$ (4) $\frac{2Br}{\mu_0}$

38. A toroid having inner radius 10 cm, outer radius 11 cm and 10000 turns is carrying current 2 A. Magnetic field at a point at distance 5 cm from the centre of its curvature is

(1) Zero (2) 10 mT

(3) 10 T (4) 10 μT

39. Net magnetic field at the centre of the circle O due to a current carring loop as shown in figure is



(1) Zero

(2) Perpendicular to paper inwards

(3) Perpendicular to paper outwards

(4) Information is insufficient

40. A charged particle enters a uniform magnetic field with velocity vector at an angle of 37° with the magnetic field. The pitch of the helical path followed by the particle is P. The radius of the helix will be

(1) $\frac{3}{2}\frac{P}{\pi}$ (2) $\frac{3}{8}\frac{P}{\pi}$

(3) $2\frac{P}{\pi}$ (4) $\frac{1}{3}\frac{P}{\pi}$

41. Two parallel long wires carrying equal currents in opposite directions are placed at $x = a$ and $x = -2a$ parallel to y-axis with z = 0. Magnitude of magnetic field at origin is B_0 and at point P ($2a$, 0, 0) it is B_P, then ratio of B_0 to B_P is

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

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

42. The dimensions of $\frac{BRC}{\mu_0}$ (where B is magnetic field and μ_0 is permiability of free space, R is resistance and C is capacitance) is

(1) $[A^1L^1T^1]$

(2) $[A^{-1}L^1T^{-1}]$

(3) $[A^{-1}L^{-1}T^1]$

(4) $[A^1L^{-1}T^1]$

43. A circular loop carrying current i of radius R is placed in the x-y plane with centre at the origin. Half of the loop with $x > 0$ is now bent so that it now lies in the y-z plane. Then new magnetic moment of the loop will be

(1) $I\pi R^2\sqrt{2}$

(2) $\frac{I\pi R^2}{2}$

(3) $2\pi IR^2$

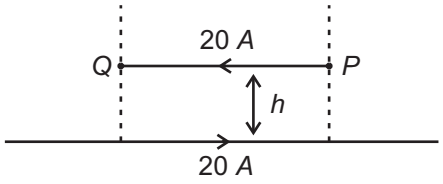
(4) $\frac{I\pi R^2}{\sqrt{2}}$

44. A current carring loop consists of 3 identical quarter circular of radius R, lying in the positive quadrants of the x-y, y-z and z-x planes with their centres at the origin, joined together then magnitude of magnetic field at origin is

(1) $\frac{\mu_0 I}{8R}$ (2) $\frac{\sqrt{3}\mu_0 I}{8R}$

(3) $\frac{\mu_0 i}{4R}$ (4) $\frac{\mu_0 I}{\sqrt{3}R}$

45. A long straight wire carring current of 20 A rests on a table as shown in figure. Another wire PQ of length 0.5 m and mass 5 gram carries the same current but in the opposite direction. The wire PQ is free to slide up and down. At what height wire PQ will be in equilibrium?



(1) 0.6 mm (2) 0.7 mm

(3) 0.8 mm (4) 0.9 mm

CHEMISTRY

46. Froth stabiliser used in froth floatation process is

(1) Pine oil (2) Fatty acids

(3) Xanthate (4) Aniline

47. Among the following reactions which does not show calcination of ore?

(1) $Fe_2O_3{\cdot}xH_2O \longrightarrow Fe_2O_3 + xH_2O$

(2) $ZnCO_3(s) \longrightarrow ZnO(s) + CO_2(g)$

(3) $Cu_2S + 2Cu_2O \longrightarrow 6Cu + SO_2$

(4) $CaCO_3 \cdot MgCO_3(s) \longrightarrow CuO(s) + MgO(s) + 2CO_2(g)$

48. Slag formed during metallurgy of copper from copper pyrite is

(1) Fe_2O_3 (2) $FeSiO_3$

(3) $Ca_3(PO_4)_2$ (4) $CaSiO_3$

49. From low grade ores, copper is extracted by

(1) Hydrometallurgy (2) Electrometallurgy

(3) Pyrometallurgy (4) All of these

50. In Van Arkel Method, the crude metal is heated in an evacuated vessel with

(1) CO_2

(2) CO

(3) I_2

(4) N_2

51. Major constituent of brass alloy is

(1) Cu (2) Zn

(3) Sn (4) Ni

52. On heating of nitrous acid (HNO_2), which of the following is not obtained as a product?

(1) HNO_3 (2) NO

(3) H_2O (4) N_2O_5

53. PCl_3 undergoes hydrolysis to produce an oxoacid, which has the formula

(1) HPO_3 (2) H_3PO_2

(3) H_3PO_4 (4) H_3PO_3

54. Which statement is incorrect for hydrides of group 15 down the group?

(1) Thermal stability decreases

(2) Reducing power increases

(3) Bond angle increases

(4) Basic nature decreases

55. Which of the following has the strongest reducing power?

(1) HI

(2) HBr

(3) HCl

(4) HF

56. In presence of moisture, SO_2 acts as

(1) An oxidising agent (2) A reducing agent

(3) A hydrolysing agent (4) A complexing agent

57. When molten sulphur is suddenly cooled by pouring into water, it takes the form of

(1) Milk of sulphur (2) Colloidal sulphur

(3) Flower of sulphur (4) Plastic sulphur

58. Gun metal is an alloy of

(1) Cu + Sn + Zn (2) Fe + Ag + Ni

(3) Sn + Zn + Ni (4) Al + Zn + Sn

59. If the impurity in a metal has a greater affinity for oxygen and is more easily oxidized than the metal, the purification of metal may be carried out by

(1) Poling (2) Zone refining

(3) Electrolytic refining (4) Cupellation

60. When Cu reacts with $AgNO_3$ solution, the reaction takes place is

(1) Oxidation of Cu (2) Reduction of Cu

(3) Oxidation of Ag (4) Reduction of NO_3^-

61. KI and $CuSO_4$ solutions on mixing produces

(1) Cu_2I_2 only (2) $Cu_2I_2 + KI_3 + K_2SO_4$

(3) K_2SO_4 only (4) $CuI_2 + KI_3 + K_2SO_4$

62. AgCl is dissolved in excess of each of NH_3, KCN and $Na_2S_2O_3$. The complex ions produced in each case are

(1) $[Ag(NH_3)_2]^+$, $[Ag(CN)_2]^+$ and $[Ag(S_2O_3)_2]^{3-}$

(2) $[Ag(NH_3)_2]^{2+}$, $[Ag(CN)_2]^{3-}$ and $[Ag(S_2O_3)_2]^{2-}$

(3) $[Ag(NH_3)_4]^{2+}$, $[Ag(CN)_2]^{3-}$ and $[Ag_2(S_2O_3)_2]^{2-}$

(4) $[Ag(NH_3)_2]^+$, $[Ag(CN)_2]^-$ and $[Ag(S_2O_3)_2]^{3-}$

63. Magnetic moment of Sc^{+x} ion is zero. What will be value of x?

(1) 1 (2) 2

(3) 3 (4) 4

64. The formula of potassiumdicyanobis(oxalato) nickelate (II) is

(1) $K_4[Ni(CN)_2(ox)_2]$

(2) $K_3[Ni_2(CN)_2(ox)_2]$

(3) $K[Ni(CN)(ox)_2]$

(4) $K_2[Ni(CN)_2(ox)_2]$

65. Bond enthalpy (in kJ mol^{-1}) of triple bond present in diatomic molecule of nitrogen is nearly

(1) 9.414 (2) 941.4

(3) 318 (4) 3.18

66. Select the reaction which does not form dinitrogen as one of the product

(1) $Ba(N_3)_2 \xrightarrow{\Delta}$

(2) $NH_4Cl + NaNO_2 \xrightarrow{\Delta}$

(3) $(NH_4)_2SO_4 + 2NaOH \longrightarrow$

(4) $(NH_4)_2Cr_2O_7 \xrightarrow{\Delta}$

67. Hydrides, which has negative enthalpy of formation is

(1) NH_3 (2) BiH_3

(3) AsH_3 (4) SbH_3

68. Incorrect match of name of oxyacids of phosphorous is

(1) H_3PO_2 : Phosphinic acid

(2) H_3PO_3 : Phosphonic acid

(3) $H_4P_2O_6$: Hypophosphorous acid

(4) $H_4P_2O_5$: Pyrophosphorous acid

69. Select the incorrect statement about ozone.

(1) Its formation is endothermic

(2) During its formation from oxygen entropy increases

(3) Its pure liquid form is dark blue

(4) It is thermodynamically unstable

70. Select the correct option (s) about SO_2 molecule

(1) It is angular

(2) It has two canonical forms

(3) Its liquid is solution used as solvent to dissolve organic and inorganic compounds

(4) All of these

71. Number of 'Cl = O' bond(s) is $HClO_4$ is

(1) 1

(2) 2

(3) 3

(4) 4

72. Which of the following contain S—O—S linkage?

(1) $H_2S_2O_3$ (2) $H_2S_2O_6$

(3) $H_2S_2O_7$ (4) $H_2S_2O_4$

73. Consider the following statements

(a) N_2O_3 is an acid anhydride of HNO_2.

(b) Bleaching action of SO_2 is due to reduction.

(c) Ozone reacts with dry iodine to form I_4O_9.

Correct among the following is

(1) (a), (b) (2) (b), (c)

(3) (a), (c) (4) (a), (b) and (c)

74. Acidified KIO_3 converts into I_2 by

(1) O_3 (2) $KMnO_4$

(3) SO_2 (4) $K_2Cr_2O_7$

75. Correct match among the following is

(1) $ClO_4^- > ClO_3^- > ClO_2^- > ClO^-$: Stability order

(2) $F_2 > Cl_2 > Br_2 > I_2$: Bond strength

(3) $OCl_2 < OBr_2 < OF_2$: Bond angle

(4) $I^- < Cl^- < Br^-$: Reducing power

76. Aqua regia reacts with Au to yield

(1) $Au(NO_3)_3$ (2) $H[AuCl_4]$

(3) $AuCl_4$ (4) AuCl

77. In which of the following ions, the colour is not due to *d-d* transition?

(1) $[Co(NH_3)_6]^{3+}$ (2) $[Fe(CN)_6]^{3-}$

(3) MnO_4^- (4) $[Mn(H_2O)_6]^{2+}$

78. Ligand of highest trans effect is

(1) Br^- (2) C_2H_4

(3) OH^- (4) H_2O

79. Outer orbital complex in the following is

(1) $[Co(H_2O)_6]^{3+}$ (2) $[Cr(H_2O)_6]^{3+}$

(3) $[Fe(CN)_6]^{3-}$ (4) $[Cu(H_2O)_6]^{2+}$

80. CFSE (Δ_0) will be minimum be in

(1) $[Co(H_2O)_6]^{3+}$

(2) $[Co(NH_3)_6]^{3+}$

(3) $[Co(H_2O)_6]^{2+}$

(4) $[Co(C_2O_4)_3]^{3-}$

81. Carbon reduction method is used for

(1) Ag (2) Au

(3) Al_2O_3 (4) Fe_2O_3

82. Psuedo halide species in the following is

(1) O_2^- (2) CN^-

(3) O_3^- (4) CO

83. On hydrolysis of BrF_3 products formed are

(1) HBr and HF (2) $HBrO_2$ and HOF

(3) HOBr and HF (4) $HBrO_2$ and HF

84. Element which has one electron in '5*s*' orbital is

(1) Cd (2) Y

(3) Ag (4) Zr

85. Ion which does not has $3d^6$ configuration, is

(1) Co^{3+} (2) Ni^{4+}

(3) Cr^+ (4) Fe^{2+}

86. Select the complex in the following having maximum number of isomers.

(1) $K_3[Co(ox)_3]$ (2) $[Co(gly)_3]$

(3) $[Co(en)_2Br_2]Cl$ (4) $[Fe(H_2O)_6]Cl_3$

87. Number of 'Cr — O — Cr' bond(s) in dichromate ion is

(1) 1 (2) 3

(3) 4 (4) 5

88. Select the incorrect statement(s) about lanthanoids.

(1) All lanthanoids are silvery white soft metals.

(2) Many trivalent lanthanoid ions are coloured.

(3) These are bad conductors of heat and electricity.

(4) Hardness increases with increase in atomic number.

89. EAN value of iron in $[Fe(CN)_6]^{3-}$ ion is

(1) 35 (2) 36

(3) 37 (4) 34

90. Possible distribution of hybrid orbitals in space for complex having co-ordination number 4 is

(1) Trigonal planar (2) Square planar

(3) Trigonal bipyramidal (4) Octahedral

BOTANY

91. The pea plants heterozygous for round seed shape and yellow seed colour were selfed and total 800 seeds are collected. What is the total number of seeds with both recessive traits?
(1) 200 (2) 50
(3) 100 (4) 400

92. A disorder due to trisomy of an autosome is
(1) Colourblindness (2) Sickle cell anaemia
(3) Down's syndrome (4) Turner's syndrome

93. Point mutation is a change in
(1) A single base pair of DNA
(2) Entire sequence of base pairs in a mRNA
(3) Three base pairs of DNA due to deletion
(4) Two base pairs of DNA due to addition

94. Individuals inflicted with Klinefelter's syndrome
(1) Have 44 + XO type of chromosome complement
(2) Show female type pubic hair pattern
(3) Have short stature
(4) Are sterile females with Gynaecomastia

95. A gene which hides/masks the action of another gene is termed as
(1) Dominant gene (2) Epistatic gene
(3) Hypostatic gene (4) Duplicate gene

96. There are seven phenotypes of skin colour in man. Which phenotype is more frequent than others?
(1) Fairly dark (2) Light
(3) Mulatto (4) Dark

97. How many linkage groups are present in human male?
(1) 22 (2) 23
(3) 24 (4) 46

98. All the given traits of pea plant can express themselves in heterozygous condition, **except**
(1) Inflated pod shape (2) Green pod colour
(3) Axial flower position (4) Green seed colour

99. If a cross between violet flowered pea plant and white flowered pea plant produces 50% offspring with dominant character and 50% offspring with recessive characters, the genotypes of parents are
(1) Aa × aa (2) Aa × Aa
(3) AA × aa (4) AA × Aa

100. A single gene showing multiple phenotypic effects is called
(1) Pleiotropy (2) Multiple allelism
(3) Epistasis (4) Codominance

101. Starch synthesis in pea seeds shows
(1) Complete dominance
(2) Co-dominance
(3) Incomplete dominance
(4) Multiple allelism

102. The first child of a couple has AB blood group. Which of the following types of parental cross is **not** possible for it?
(1) $I^A I^A \times I^B I^B$ (2) $I^A I^O \times I^B I^B$
(3) $I^A I^O \times I^O I^O$ (4) $I^A I^O \times I^B I^O$

103. Which of the following is sex influenced trait?
(1) Milk glands in females
(2) Short index finger in males
(3) Antlers in male deer
(4) Brilliant plumage in pea-cock

104. In which of the following organism the female will determine the sex of the progeny?
(1) Grasshopper (2) *Drosophila*
(3) Birds (4) *Dioscorea*

105. If mother has blood group AB and father is heterozygous for blood group A, then which of the following blood group is not possible in their children?
(1) A (2) B
(3) AB (4) O

106. The F_2 dihybrid phenotypic ratio of complimentary genes is
(1) 9 : 6 : 1 (2) 9 : 3 : 3 : 1
(3) 9 : 7 (4) 15 : 1

107. A diploid organism is homozygous for three loci and heterozygous for 2 loci. How many types of gametes are produced?
(1) 8 (2) 32
(3) 16 (4) 4

108. Which of the following chemical mutagens acts as a deaminating agent?
(1) Acridine dye (2) Nitrous acid
(3) 5-Bromouracil (4) Both (1) and (3)

109. Select the **true** statement about Chargaff's rule.
(1) Molar amount of guanine is equal to that of adenine
(2) A + T / C + G is more than unity in bacteria
(3) Applicable to ssDNA
(4) A + G / T + C is equal to one

110. Mark the **incorrect** pair (w.r.t. sex determination)
(1) XX – XY type – *Melandrium*
(2) XX – XO type – Moth
(3) XX – XY type – Humans
(4) ZO – ZZ type – Butterflies

111. Choose the **incorrect** statement for true breeding lines in pea.
(1) They show stable trait inheritance
(2) They have undergone continuous self-pollination
(3) Only green pod colour is expressed in this breeding lines
(4) Cross pollinated pea plants do not form true breeding lines

112. The chromosome constitution 2n –2 of an organism represents
(1) Triploidy
(2) Trisomy
(3) Monosomy
(4) Nullisomy

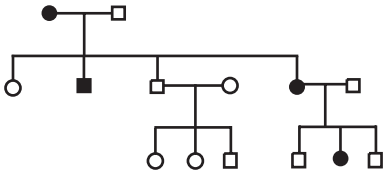
113. Euchromatin is
(1) Densely packed
(2) Darkly stained region
(3) Transcriptionally inactive
(4) Transcriptionally active

114. How many types of DNA polymerases are found in prokaryotes?
(1) Two
(2) Three
(3) Four
(4) Five

115. Which of the following type of rRNA is **not** present in prokaryotic cell?
(1) 5 S
(2) 5.8 S
(3) 16 S
(4) 23 S

116. *lac* operon
(a) Has three structural genes
(b) Is repressible system
(c) Is anabolic system
(1) Only a is correct
(2) Only a and b are correct
(3) Only b and c are correct
(4) All a, b and c are correct

117. The below pedigree can best explain



(1) Haemophilia
(2) Turner's syndrome
(3) Myotonic dystrophy
(4) Hypertrichosis

118. All of the following were the reasons for use of *Drosophila* as ideal material for genetic studies, **except**
(1) It can be grown in simple synthetic medium
(2) Male is larger than female
(3) Easily observable hereditary variations were present
(4) Single mating produces large number of progenies

119. Which of the following enzyme is mainly involved in DNA repair in *E.coli*?
(1) Primase (2) DNA polymerase I
(3) DNA polymerase III (4) DNA polymerase II

120. If the sequence of sense strand of DNA is 5′GCATGCATGCATT3′, then what will be the sequence of its primary transcript?
(1) 3′ CGUAGCUACGUAU 5′
(2) 3′ GCAUGCAUGCAUU 5′
(3) 5′ CGUACGUACGUAA 3′
(4) 5′ GCAUGCAUGCAUU 3′

121. The distance between genes for eye colour and wings in *Drosophila* is
(1) 1.3%
(2) 62.8%
(3) 37.2%
(4) 98.7%

122. Which of the following cross(es) shall give phenotypic ratio 1 : 1 : 1 : 1?
(1) A tall (Tt) pea plant crossed with dwarf (tt) plant
(2) A tall pea plant with round seed shape (TtRr) crossed with dwarf plant with wrinkled seed shape (ttrr)
(3) A wheat plant (AaBb) crossed with another wheat plant (aabb) for kernel colour
(4) Both (2) and (3)

123. Which of the given disorder is an inborn error of metabolism?
(1) Sickle cell anaemia
(2) PKU
(3) Down's syndrome
(4) Turner's syndrome

124. How many enzymes or proteins are related to translation?

Poly A polymerase, Primase, Topoisomerase, RNA ligase, Aminoacyl-tRNA synthetase, DNA polymerase

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

125. Famous double helix model for the structure of DNA was proposed by
(1) Kornberg (2) Watson and Crick
(3) Jacob and Monad (4) Beadle and Tatum

126. Initiation of transcription in *E.coli* is catalysed by
(1) Sigma factor of DNA dependent RNA polymerase
(2) Sigma factor of RNA dependent RNA polymerase
(3) DNA dependent RNA polymerase without sigma factor
(4) Rho factor of RNA polymerase

127. Find out the **wrongly** matched pair (w.r.t. operon).
(1) Inducer – Lactose
(2) Repressible operon – *Trp* operon
(3) Apo-repressor – Tryptophan
(4) Positive control – *lac* operon

128. mRNA
(1) Is the smallest RNA
(2) Has catalytic role during translation
(3) Is adapter molecule
(4) Carries genetic information

129. The very fine X-ray diffraction picture of DNA was obtained by
(1) J.Watson and F.Crick
(2) E.Chargaff
(3) M.Wilkins and R.Franklin
(4) F.Meischer

130. DNA was extracted from *Streptococcus* bacterium. The proportion of cytosine was found to be 32%, then calculate the amount of adenine.
(1) 28%
(2) 18%
(3) 32%
(4) 38%

131. TDF gene is the smallest gene in humans which is present on
(1) Chromosome-7
(2) Chromosome-1
(3) X-chromosome
(4) Y-chromosome

132. If both parents are carrier for sickle cell anaemia then what are the chances of pregnancy resulting in an affected child?
(1) 50%
(2) 75%
(3) 25%
(4) 100%

133. Change in linear order of genes by rotation of a section of chromosome involving the centromere by 180° is called
(1) Pericentric inversion
(2) Paracentric inversion
(3) Transversion
(4) Transition

134. The genetic material of QB bacteriophage
(1) Has 5 methyl uracil
(2) Is able to replicate itself
(3) Has free $2^{'}$ OH in its sugar component
(4) Undergoes no mutational changes

135. Out of the following last step of DNA fingerprinting is
(1) Isolation of desired DNA
(2) Autoradiography
(3) Hybridisation
(4) Blotting

ZOOLOGY

136. S.L. Miller created electric discharge in a closed flask at a temperature of
(1) 8000°C (2) 800°C
(3) 80,000°C (4) 80°C

137. The early atmosphere was
(1) Oxidising in nature
(2) Reducing in nature
(3) Non-reactive in nature
(4) Lacking in free hydrogen

138. Life appeared approximately how many years after formation of earth?
(1) 2 billion years (2) 3 billion years
(3) 500 million years (4) 4 billion years

139. According to Darwin, fitness word refers primarily to
(1) Reproductive fitness (2) Physical fitness
(3) Physiological fitness (4) Social fitness

140. Choose the relatively most accurate method for radioactive dating of fossils among options below
(1) Carbon method
(2) Electron spin resonance method
(3) Potassium method
(4) Uranium method

141. Fossils of which of the following suggests that early men probably ate meat, used fire and had cranial capacity around 900 cc?
(1) *Homo erectus* (2) *Homo habilis*
(3) Neanderthal man (4) *Australopithecus*

142. According to Hardy-Weinberg principle, the frequency of homozygous recessive individuals is represented by
(1) p^2 (2) q^2
(3) pq (4) 2pq

143. If mating is random, population is large and mutations do **not** occur, then gene frequencies of a population from generation to generation remain constant. This principle was put forward by
(1) Lederberg and Lederberg
(2) A.R Wallace
(3) Hardy and Weinberg
(4) Ernst Haeckel

144. The presence of a row of vestigial gill slits in embryonic life of humans supports the theory of
(1) Metamorphosis (2) Recapitulation
(3) Biogenesis (4) Abiogenesis

145. Industrial melanism is an example of
(1) Neo - Lamarckism
(2) Disruptive selection
(3) Natural selection
(4) Mutations caused by industrial pollution

146. Who proposed that the first form of life could have come from pre-existing non-living organic molecules?
(1) Hugo de Vries (2) T.R. Malthus
(3) Oparin and Haldane (4) S.L. Miller

147. Prehistoric cave art developed how many years ago?
(1) 1,00,000 years (2) 18,000 years
(3) 10,000 years (4) 40,000 years

148. The phrase first human-like being, the hominid with cranial capacity 650-800 cc is associated with
(1) *Australopithecus*
(2) *Homo habilis*
(3) *Homo erectus*
(4) *Homo sapiens fossilis*

149. Match the Column I with Column II.

	Column I		**Column II**
a.	Simultaneous extinction of many animal populations by a natural calamity	(i)	Theory of Biogenesis
b.	Spores from outer space reached earth through meteorites	(ii)	Theory of primary Abiogenesis
c.	Micro-organisms when carried by air, created life in favourable media	(iii)	Theory of Catastrophism
d.	Creation of complex organic molecules in Earth's primordial soup through a series of chemical reactions	(iv)	Theory of Panspermia

Choose the **correct** option.
(1) a(ii), b(iv), c(i), d(iii) (2) a(iii), b(i), c(iv), d(ii)
(3) a(iii), b(iv), c(ii), d(i) (4) a(iii), b(iv), c(i), d(ii)

150. Sweet potato and potato are
(1) Homologous organs that have evolved due to convergent evolution
(2) Homologous organs that have evolved due to divergent evolution
(3) Analogous organs that have evolved due to convergent evolution
(4) Analogous organs that have evolved due to divergent evolution

151. Select **incorrect** statement.
(1) The first simplest organic compound to form in primitive atmosphere was hydrocarbon like methane
(2) The atmosphere at the time of origin of life on earth was rich in ammonia
(3) Amino acids, sugars, glycerol and fatty acids present in the primitive oceans formed proteins, polysaccharides and fats
(4) Big Bang theory explains origin of Earth

152. The largest land reptile which is now extinct is
(1) *Ichthyosaurus* (2) *Archaeopteryx*
(3) *Tyrannosaurus rex* (4) Pelycosaurs

153. Primates called Australopithecines roamed the Earth about
(1) 3 - 4 mya (2) 1.5 mya
(3) 9 - 12 mya (4) 15 mya

154. The term 'saltation' in context of evolution was proposed by
(1) Charles Darwin
(2) Ernst Haeckel
(3) Hugo de Vries
(4) Jean Baptiste Lamarck

155. *Archaeopteryx* is a missing link between
(1) Pisces and Amphibia
(2) Amphibia and Reptilia
(3) Reptilia and Aves
(4) Aves and Mammalia

156. Most recent probable mammalian ancestor was
(1) Pelycosaurs (2) Thecodont
(3) Therapsids (4) Sauropsids

157. Which one is **not** a vestigial organ in man?
(1) Caudal vertebrae (coccyx)
(2) Body hair in male
(3) Segmental muscles in abdomen
(4) Ear pinna

158. When a few individuals are dispersed from parent population accidentally and they establish a new, isolated colony at some distance from their place of origin, this phenomenon is known as
(1) Bottle neck effect (2) Founder's effect
(3) Directional selection (4) Disruptive selection

159. Mutations are pre adaptive was suggested through experiments conducted by
(1) Joshua Lederberg
(2) Thomas Malthus
(3) Alfred Wallace
(4) August Weismann

160. In which type of natural selection are two peaks formed at the two extremes of the distribution curve and a kind of depression forms in centre?
(1) Directional selection (2) Disruptive selection
(3) Stabilising selection (4) Balancing selection

161. Which one is considered as a pollution indicator?
(1) *Biston betularia* (2) Lichens
(3) Darwin finches (4) Australian marsupials

162. Match Column I with Column II.

	Column I		**Column II**
a.	Flying phalanger	(i)	Evolution by anthropogenic action
b.	Industrial melanism	(ii)	Bottleneck effect
c.	Cycads and dicotyledons	(iii)	Marsupial with volant adaptation
d.	Extinction of Cheetahs	(iv)	Progymnosperms

Choose the **correct** option.
(1) a(ii), b(iii), c(i), d(iv) (2) a(iv), b(ii), c(i), d(iii)
(3) a(iii), b(iv), c(ii), d(i) (4) a(iii), b(i), c(iv), d(ii)

163. During the operation of which type of natural selection does mean trait get favoured and the resultant peak is higher and narrower?
(1) Stabilising (2) Directional
(3) Disruptive (4) Progressive

164. 'Darwin's finches' present an example of all **except** one
(1) Differences in feeding habit
(2) Convergent evolution
(3) Founder's effect
(4) Adaptive radiation

165. Psilophyton gave rise to all **except**
(1) Gnetales
(2) Conifers
(3) Gingkos
(4) Lycopods

166. Select the **incorrect** statement.
(1) Major adaptive radiation of mammals occurred during the Cenozoic era
(2) Dinosaurs were dominant during the Jurassic period
(3) Prototherians have possibly evolved from reptiles
(4) The first life on Earth definitely originated on land around 4 bya

167. 'Use and disuse of organ' and 'Inheritance of acquired characters' were the key concepts of theory of evolution proposed by
(1) Darwin
(2) Lamarck
(3) Malthus
(4) Haldane

168. Choose the option representing a **false** statement
(1) Tasmanian wolf is a marsupial while wolf is a placental mammal. They show convergent evolution.
(2) Convergent evolution is exemplified by wings of mosquito, bat and pigeon
(3) Existence of marsupials in Australia and New Zealand prove continental drift.
(4) Most primitive living mammals which provide an evidence of organic evolution in context of geographical distribution are said to be eutherian mammals.

169. The most common mechanism of genetic variation in a population of sexually reproducing organisms is
(1) Recombination
(2) Transduction
(3) Absence of gene flow
(4) Lack of genetic drift

170. The production of ecologically diverse species from a common ancestral stock, that gave rise to a variety of pouched marsupials in Australia is termed as phenomenon of
(1) Adaptive convergence
(2) Adaptive radiation
(3) Seawall Wright effect
(4) Sympatric speciation

171. The allelic frequency of a dominant allele is 0.8. Select the number of heterozygous individuals in a population of 1000 from options below
(1) 80
(2) 320
(3) 180
(4) 120

172. Choose the **odd** one out
(1) Phyllode of *Acacia* and cladode of *Asparagus*
(2) Potato and sweet potato
(3) Tendrils in *Pisum* and *Passiflora*
(4) Forelimbs of whale and bat

173. As per modern synthetic theory, the basic unit of evolution is
(1) Genus
(2) Species
(3) Population
(4) Individual

174. Which one is referred to be the first one toed horse?
(1) *Equus*
(2) *Pliohippus*
(3) *Merychippus*
(4) *Mesohippus*

175. The fossils of various mammals are relatively abundant in which era?
(1) Cenozoic
(2) Mesozoic
(3) Paleozoic
(4) Proterozoic

176. The three horned, non-avian herbivore dinosaur was
(1) Triceratops
(2) Pteranodon
(3) Stegosaurus
(4) Brachiosaurus

177. Complete the analogy

Anteater : Numbat :: Lemur :

(1) Tasmanian tiger cat (2) Flying phalanger
(3) Spotted cuscus (4) Marsupial mole

178. Select the **incorrect** statement w.r.t. Malthusian theory.

(1) Every population has an inherent capacity to increase its number exponentially.

(2) The population remains stable in size even during all seasonal fluctuations.

(3) Excessive exploitation of natural resources badly affect the size of population

(4) Nature keeps a control over the size of population by posing several challenges.

179. The animal called lobefin which evolved into the first amphibian was

(1) Coelacanth (2) Salamanders

(3) Modern day frogs (4) Crocodiles

180. Cave paintings by Pre-historic humans can be seen at Bhimbetka rock shelter in Raisen district of

(1) Rajasthan (2) Uttar Pradesh

(3) Madhya Pradesh (4) Jharkhand

❑ ❑ ❑