Aakash
Medical | IIT-JEE | Foundations
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Time : 3 Hrs. **MM : 720**

MOCK TEST
for
AIPMT-2016

GENERAL INSTRUCTIONS :

1. AIPMT-2016 shall be a single paper consisting 180 objective type questions from Physics, Chemistry and Biology (Botany & Zoology).
2. For each correct response 4 marks will be awarded, whereas for each incorrect response 1 mark will be deducted from the total score.
3. No deduction from the total score will be made if no response is indicated.
4. More than one answer will be negatively marked.
5. Students can opt for Question Paper either in English or in Hindi.
6. Questions are to be answered on the specially designed machine-gradable sheet using Blue/Black Ball Point Pen only.
7. Mark should be dark and should completely fill the circle in the answer sheet.
8. Do not use white-fluid or any other rubbing material on answer sheet. No change in the answer once marked.
9. Rough work must not be done on the answer sheet.
10. Student cannot use log tables and calculators of any other material in the examination hall.

PHYSICS

Choose the correct answer :

1. A uniform thick rope of length 10 m is resting on a horizontal frictionless surface. It is pulled by a force of 5 N at one end. Then what is the tension in the rope at 2 m from the end where the force is applied?

   (1) 6 N

   (2) 8 N

   (3) Zero

   (4) 4 N

2. A car of mass (m) accelerates, starting from rest, while the engine supplies constant power P. Then velocity varies with time (t) as

   (1) $v \propto t$ (2) $v \propto t^{1/2}$

   (3) $v \propto t^2$ (4) $v \propto t^{3/2}$

3. The position (x) of a particle varies with time as $t = \alpha x^2 + \beta x$, then acceleration of particle is

   (1) $2\beta v^3$ (2) $2\alpha v^3$

   (3) $-2\beta v^3$ (4) $-2\alpha v^3$

4. If the coefficient of friction between an ANT and hemispherical bowl is μ and radius of bowl is R, then upto what maximum height ANT may crawl?

   (1) $R\left[1+\frac{1}{\sqrt{1+\mu^2}}\right]$ (2) $R\left[1-\frac{1}{\sqrt{1+\mu^2}}\right]$

   (3) $\frac{\sqrt{1+R^2}}{\mu}$ (4) $\frac{\sqrt{1+R^2}}{R\mu}$

5. The depth $d(<<R)$ at which the value of acceleration due to gravity becomes $\frac{1}{x}$ times the value at the surface is

(1) $\frac{R(x-1)}{R}$

(2) $\frac{R(x-1)}{x}$

(3) $\frac{R \cdot x}{x-1}$

(4) $\frac{R}{x}$

6. The ratio of heat developed in three wires having lengths in the ratio 1 : 5 : 8 and radii 1 : 2 : 3 in parallel combination

(1) 1 : 25 : 64

(2) 1 : 4 : 9

(3) 40 : 32 : 45

(4) 45 : 32 : 40

7. A photodetector used to detect the wavelength of 1700 nm, has energy gap of about

(1) 0.73 eV (2) 0.03 eV

(3) 1.2 eV (4) 1.16 eV

8. A physical quantity depends on time t as $A = A_0 e^{-\alpha t^3}$. Then constant α has dimensions

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

(3) $[T^{-1}]$ (4) $[T^{-3}]$

9. If a block takes thrice as much time to slide down a 45° rough inclined plane as it takes to slide down a similar smooth plane. Then coefficient of friction is

(1) $\frac{1}{3}$ (2) $\frac{2}{3}$

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

10. Under the action of a force a 2 kg body moves such that its position x as a function of time t is given by $x = \frac{t^4}{4} + 3$. Then work done by the force in first two seconds is

(1) 6 J (2) 10 J

(3) 7 J (4) 64 J

11. The semivertex of conical pendulum through which a body can perform uniform circular motion, if the string supports $\frac{2}{\sqrt{3}}$ times its weight, is

(1) 90° (2) 30°

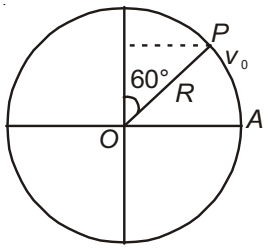
(3) 60° (4) 120°

12. If $\vec{a} + \vec{b} = \vec{c}$ and $a + b = c$, then angle between $\vec{a}$ and $\vec{b}$ is

(1) 90° (2) 30°

(3) 60° (4) 0°

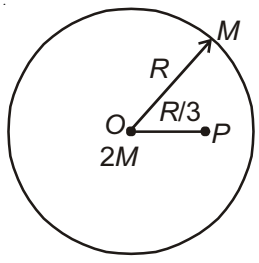
13. In given figure under critical condition of a vertical circular motion, find the velocity (v_0) at point P.



(1) $\sqrt{gR}$ (2) $\sqrt{3gR}$

(3) $\sqrt{2gR}$ (4) $\sqrt{4gR}$

14. At the centre of a spherical shell of mass M and radius R, a point mass $2M$ is placed. Then, gravitational potential at distance $\frac{R}{3}$ from the centre is



(1) $-\frac{GM}{R}$ (2) $-\frac{3GM}{R}$

(3) $-\frac{7GM}{R}$ (4) $+\frac{3GM}{R}$

15. If a body has equal amount of rotational kinetic energy and translational kinetic energy while rolling without slipping on a horizontal surface. Then body is a

(1) Disc (2) Solid sphere

(3) Ring (4) Solid cylinder

16. A body floats in water with one-third of its volume above the surface of water. If it is placed in some oil, it floats with half of its volume above the oil surface. Then, specific gravity of the oil is

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

(3) $\frac{4}{3}$ (4) 1

17. A string is hanging from a rigid support. A transverse wave pulse is generated at its free end. The speed of wave pulse at distance x from its free end is proportional to

(1) x^2 (2) x

(3) $\sqrt{x}$ (4) $\frac{1}{x}$

18. The time period of oscillation of total energy of a harmonic oscillator having angular frequency (ω) is

(1) $\frac{2\pi}{\omega}$ (2) $\frac{\pi}{\omega}$

(3) Infinite (4) $\frac{\pi}{2\omega}$

19. Force acting on a charged particle kept between the plates of a charged capacitor is F. If one of the plates of capacitor is removed, then same particle will experience a force

(1) $\frac{F}{2}$ (2) Zero

(3) F (4) $2F$

20. If the current through an inductor of 2 H is given by $i = t\sin t$, then voltage across the inductor of 2 H is

(1) $\cos t + t\sin t$ (2) $2t\cos t + 2\sin t$

(3) $t\cos t + \sin t$ (4) $2t\sin t + 2\cos t$

21. Young's double slit experiment is performed by two lights of yellow and green colours having fringe widths β_1 and β_2, then $\frac{\beta_1}{\beta_2}$ is

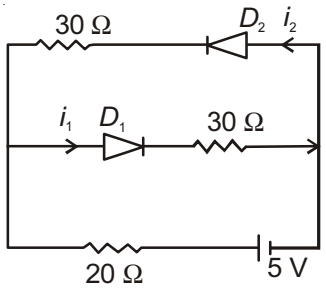
(1) 1

(2) > 1

(3) < 1

(4) Cannot be predicted

22. The currents through diodes D_1 and D_2 are



(1) $i_1 = 0.1$ A, $i_2 = 0.1$ A

(2) $i_1 = 0.1$ A, $i_2 = 0$

(3) $i_1 = 0$, $i_2 = 0.3$ A

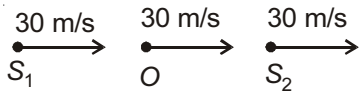
(4) $i_1 = 0$, $i_2 = 0$

23. A body connected at the end of a spring executes SHM with a time period t_1, while the corresponding period for another spring is t_2. If the period of oscillation with the two springs in series is T, then

(1) $T = t_1 + t_2$ (2) $T^2 = t_1^2 + t_2^2$

(3) $\frac{1}{T} = \frac{1}{t_1} + \frac{1}{t_2}$ (4) $\frac{1}{T^2} = \frac{1}{t_1^2} + \frac{1}{t_2^2}$

24. Consider two sound sources S_1 and S_2 having same frequency 100 Hz and the observer O located between them. All the three are moving with same velocity in same direction. The beat frequency as heard by the observer is



(1) Zero (2) 2

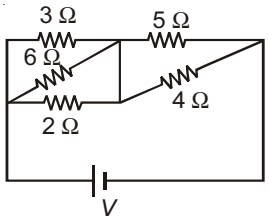
(3) 3 (4) 4

25. An ideal gas at 27°C is compressed adiabatically to $\frac{8}{27}$ of its original volume. If $\gamma = \frac{5}{3}$, then rise in temperature is

(1) 450 K (2) 375 K

(3) 675 K (4) 405 K

26. The resistor in which maximum heat will be produced, is



(1) 6 Ω (2) 2 Ω

(3) 5 Ω (4) 4 Ω

27. The cathode of a photoelectric cell is changed such that the work function changes from ϕ_1 to ϕ_2 where ($\phi_2 > \phi_1$). If the current before and after change are I_1 and I_2 respectively and all other conditions remaining unchanged, then (assuming $h\nu > \phi_2$)

(1) $I_1 = I_2$

(2) $I_1 < I_2$

(3) $I_1 > I_2$

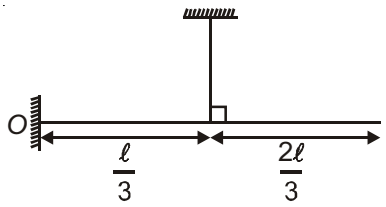
(4) $I_1 < I_2 < 2I_1$

28. If the shortest wavelength of Lyman series of H atom is *X*, then the wavelength of first member of Balmer series of H atom will be

(1) $\frac{9X}{5}$ (2) $\frac{36X}{5}$

(3) $\frac{5X}{9}$ (4) $\frac{5X}{36}$

29. A rod of mass *m* and length ℓ hinged in a vertical wall and kept horizontal by massless vertical thread as shown. Tension in thread is



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

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

30. A copper wire of cross-section *A* is under tension *T*. Find the fractional decrease in the cross-sectional area (Young's modulus is *Y* and Poisson's ratio is σ)

(1) $\frac{2\sigma T}{AY}$ (2) $\frac{AY}{2\sigma T}$

(3) $\frac{3AY}{2\sigma T}$ (4) $\frac{\sigma T}{AY}$

31. Point charges 4 μC, –1 μC and 4 μC are kept on *y*-axis $y = 2a$, $y = 3a$ and $y = 4a$

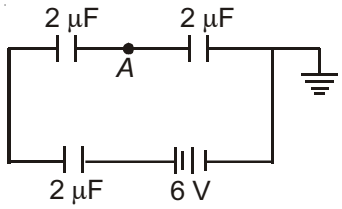
(1) Only –1 μC is in equilibrium

(2) None of the charges are in equilibrium

(3) All the charges are in equilibrium

(4) All the charges are in stable equilibrium

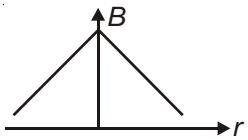
32. Three capacitors each of capacitance 2 μF are connected to a cell of 6 V as shown in the figure. The potential at point *A* will be

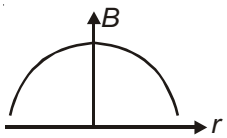


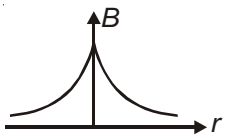
(1) 2 V (2) –2 V

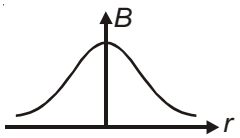
(3) 3 V (4) –3 V

33. The magnetic field due to current carrying circular coil on its axis varies with distance as

(1) 

(2) 

(3) 

(4) 

34. Apparent dip at a place are $\cot^{-1}2$ and $\cot^{-1}2\sqrt{3}$ in two mutually perpendicular planes of dip circle. The true dip θ at the place will be

(1) $\theta = \cot^{-1}(2)$ (2) $\theta = \cot^{-1}(2\sqrt{3})$

(3) $\theta = \cot^{-1}(4)$ (4) $\theta = \cot^{-1}(3)$

35. Two bodies, a ring and a disc are rolled down without slipping from an inclined plane of angle θ. What will be ratio of acceleration of centre of mass of two bodies?

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

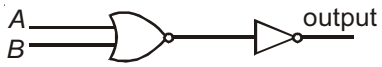
(3) $\frac{1}{3}$ (4) $\frac{3}{4}$

36. For a process of monotomic gas pressure (*P*) and volume (*V*) are related as PV^{-3} = constant. What will be the molar heat capacity of gas?

(1) $\frac{5R}{3}$ (2) $\frac{3}{5}R$

(3) $\frac{7}{4}R$ (4) $\frac{R}{4}$

37. What will be outputs of circuit, if input for terminal *A* and *B* are (1, 0) and (0, 1)?



(1) 1, 1 (2) 0, 0

(3) 0, 1 (4) 1, 0

38. Rain droplets are falling in vertically downward direction with velocity 5 m/s. A cyclist is moving in northward direction with velocity 10 m/s. The rain droplets will appear to the cyclist to be coming from

(1) $\tan^{-1}(2)$ above south horizon

(2) $\tan^{-1}\left(\frac{1}{2}\right)$ above north horizon

(3) Vertically downward

(4) $\tan^{-1}(2)$ above north horizon

39. When an elevator is moving upward, the apparent weight of a body inside elevator

(1) Will increase

(2) Will decrease

(3) Remain the same

(4) May be any of these

40. An electric dipole in non-uniform electric field has

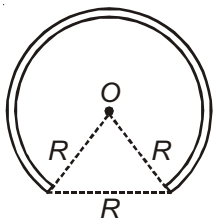
(1) Rotational motion only

(2) Translational motion only

(3) Both rotational and translational motion

(4) All of these are possible

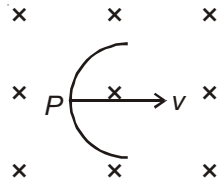
41. A bar magnet of magnetic moment *M* is bent as a part of circle shown in the figure. The new magnetic moment is



(1) M (2) $\frac{3M}{5\pi}$

(3) $\frac{5M}{3\pi}$ (4) $\frac{2M}{\pi}$

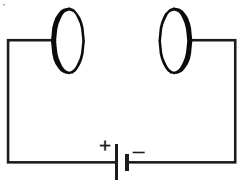
42. A conductor is moving with velocity *v* in a region of uniform magnetic field *B*. The electric field at *P* inside conductor is



(1) Zero (2) vB

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

43. A circular parallel plate capacitor is connected to a battery. Then which of the following statements is correct for the region between the plates for steady state?



(1) Electric field is zero

(2) Magnetic field is zero

(3) Displacement current exists

(4) Electric flux is changing

44. In a nuclear reaction of α-decay, the daughter nuclei ${}^{A}_{Z}X$ is moving with kinetic energy *E*. The total energy released is

(1) $\frac{E}{4}(A+4)$ (2) $\frac{E}{4}(A)$

(3) $\frac{E}{4}(A-4)$ (4) $E(A-4)$

45. Avalanche breakdown of *p-n* junction diode is due to

(1) Reverse biasing

(2) Very high electric field

(3) Collision of electron

(4) All of these

CHEMISTRY

46. If there are no intermolecular forces of attraction then the volume occupied by the molecules of 4.5 kg of water at STP will be

(1) 4.5 m^3 (2) 11.2 m^3

(3) 22.4 m^3 (4) 5.6 m^3

47. The oxidation number of phosphorous in $P_2O_7^{4-}$ is

(1) +3 (2) +2

(3) +5 (4) –3

48. $CuSO_4$ solution is treated separately with KCl and KI. In which case Cu^{2+} will be reduced to Cu^+

(1) KCl

(2) KI

(3) Both can reduce

(4) None can reduce

49. Standard electrode potentials of $Fe^{2+} + 2e^- \rightarrow Fe$ and $Fe^{3+} + 3e^- \rightarrow Fe$ are –0.44 volt and –0.036 volt respectively. The standard electrode potential for $Fe^{3+} + e^- \rightarrow Fe^{2+}$ will be

(1) – 0.404 V (2) + 0.404 V

(3) + 0.772 V (4) – 0.476 V

50. The vapour pressure of a dilute solution of glucose is 750 mm of Hg at 373 K. The mole fraction of solute is

(1) $\frac{1}{7.6}$ (2) $\frac{1}{76}$

(3) $\frac{1}{35}$ (4) $\frac{1}{10}$

51. Which of the following has only π-bond?

(1) N_2 (2) O_2

(3) O_2^+ (4) C_2

52. The reaction A $\rightarrow$ B is started with 10 g of A. After 30 and 90 min, 5 g and 1.25 g of A are left respectively. The order of reaction is

(1) Zero (2) 1

(3) 2 (4) 3

53. The degree of dissociation of $PCl_5(\alpha)$ for the equilibrium $PCl_5(g) \rightleftharpoons PCl_3(g) + Cl_2(g)$ is approximately related to the pressure at equilibrium (P) by the relation [α<<1]

(1) $\alpha \propto P$ (2) $\alpha \propto \frac{1}{\sqrt{P}}$

(3) $\alpha \propto \frac{1}{P^2}$ (4) $\alpha \propto \frac{1}{P^4}$

54. A weak acid HX ($K_a = 10^{-5}$) on reaction with NaOH gives NaX. For 0.1 M aqueous solution of NaX, the % hydrolysis is

(1) 0.001% (2) 0.01%

(3) 0.15% (4) 1%

55. Benzene reacts with iso-butyl chloride in the presence of anhyd. $AlCl_3$ to give (as a major product)

(1) t-butylbenzene (2) Isobutylbenzene

(3) n-butylbenzene (4) Sec-butylbenzene

56. Ethene is shaken with aqueous solution of Br_2 with NaCl. Which of the following is the possible product?

(1) CH_2–Br
CH_2–Br

(2) CH_2–Br
CH_2–Cl

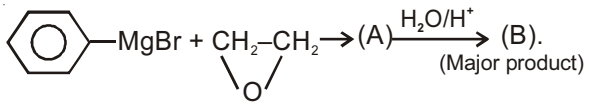
(3) CH_2–Br
CH_2–OH

(4) All of these

57. What amount of bromine will be required to convert 2 g of phenol into 2, 4, 6-tribromophenol?

(1) 20.4 g (2) 10.2 g

(3) 6.0 g (4) 4.0 g

58. 

(B) is

(1) Benzyl alcohol (2) 2-phenylethanol

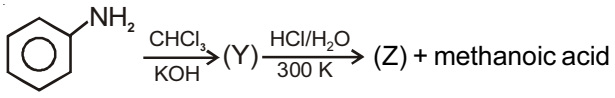
(3) 1-phenylethanol (4) Quinol

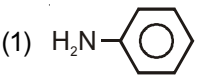
59. One mole of ethylamine when reacts with nitrous acid produces dinitrogen gas at 0ºC and 1 atmospheric pressure equal to

(1) 22.4 L (2) 1 L

(3) 11.2 L (4) 24.8 L

60. Identify (Z)



(1) 

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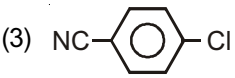
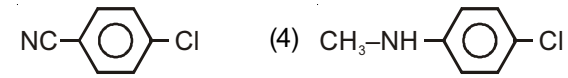
(3) 

(4) 

61. The correct order of increasing thermal stability of the given compounds is

I. HF II. HBr

III. HCl IV. HI

(1) I < II < III < IV (2) IV < II < III < I

(3) IV < II < I < III (4) II < IV < I < III

62. Which of the following will not show geometrical isomerism?

(1) $[Co(ox)_3]^{3-}$ (2) $[Co(en)_2Cl_2]Cl$

(3) $[Cr(NH_3)_4Cl_2]Cl$ (4) Both (2) & (3)

63. Which one of the following has the highest paramagnetism?

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

(3) $[Cu(H_2O)_6]^{2+}$ (4) $[Zn(H_2O)_6]^{2+}$

64. The correct order of boiling points of noble gases is

(1) He < Ne < Ar < Kr < Xe

(2) He > Ne > Ar > Kr > Xe

(3) He < Ne < Kr < Ar < Xe

(4) He < Ne < Ar < Xe < Kr

65. The correct statement/s about $H_2S_2O_7$ is/are

(1) It is called peroxydisulphuric acid

(2) It contains one O–O bond in its molecule

(3) It is obtained by dissolution of SO_3 in conc. H_2SO_4

(4) Both (2) & (3)

66. Which of the following will give maximum heat of neutrilization?

(1) NaOH + HCl (2) NaOH + CH_3COOH

(3) NaOH + HNO_3 (4) NaOH + HF

67. Which of the following statement/s is/are **correct**?

(1) Silica gel adsorbs water

(2) Catalytic action and colloidal nature are based on the phenomenon of adsorption

(3) Absorption and adsorption can take place simultaneously

(4) All of these

68. Equal masses of methane and oxygen gas are mixed in an empty container at 25°C. The fraction of the total pressure exerted by oxygen gas is

(1) $\frac{1}{2}$ (2) $\frac{2}{3}$

(3) $\frac{1}{3}$ (4) $\frac{1}{3}\times\frac{273}{298}$

69. According to Bohr's theory the angular momentum of an electron in 5th orbit is

(1) $\frac{2.5h}{\pi}$ (2) $\frac{5h}{\pi}$

(3) $\frac{25h}{\pi}$ (4) $\frac{6h}{2\pi}$

70. The IE will be maximum for the process

(1) Be $\longrightarrow$ Be^{2+} (2) Li $\longrightarrow$ Li^{+}

(3) Cs $\longrightarrow$ Cs^{+} (4) Ba $\longrightarrow$ Ba^{2+}

71. The correct relationship between the boiling points of dilute solutions of $AlCl_3(T_1)$ and $CaCl_2(T_2)$, having the same molar concentration is

(1) $T_1 > T_2$ (2) $T_2 > T_1$

(3) $T_1 = T_2$ (4) $T_2 \geq T_1$

72. Aqueous solution of 0.004 M Na_2SO_4 and 0.01 M glucose are isotonic. The degree of dissociation of Na_2SO_4 is

(1) 85% (2) 75%

(3) 60% (4) 25%

73. The formation of O_3 in upper part of atmosphere is catalyzed by

(1) N_2 (2) NO

(3) CO (4) CO_2

74. Which of the following acts as a negative catalyst?

(1) Tetraethyl lead as an antiknock compound

(2) Glycerol in decomposition of H_2O_2

(3) Ethanol in oxidation of chloroform

(4) All of these

75. For an endothermic reaction, the correct relation about energy of activation for forward and backward reaction is

(1) $E_{a(f)} > E_{a(b)}$ (2) $E_{a(f)} < E_{a(b)}$

(3) $E_{a(f)} = E_{a(b)}$ (4) None of these

76. How many unit of NaCl present per unit cell of NaCl?

(1) 4 (2) 6

(3) 2 (4) 8

77. Which of the following has the lowest heat of hydrogenation per mole?

(1) cis-2-butene (2) trans 2-butene

(3) 1-butene (4) 1, 3-butadiene

78. Which of the following statements is **incorrect**?

(1) Chlorobenzene is more reactive than benzene towards electrophilic substitution reactions

(2) C – Cl bond in chlorobenzene is less polar than in CH_3Cl

(3) Chlorobenzene is less reactive than CH_3Cl towards nucleophilic substitution reactions

(4) In chlorobenzene further electrophilic substitution takes place at ortho and para position

79. The product (Z) in the following sequence of reactions is

$$\text{Phenol} \xrightarrow{\text{pyridine}} (X) \xrightarrow[4-7 \text{ atm, } 410 \text{ K}]{CO_2} (Y) \xrightarrow{H_3O^+} (Z)$$

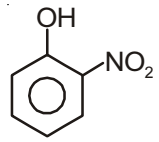
(1) Aspirin

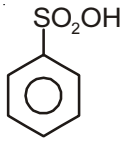
(2) Salicylaldehyde

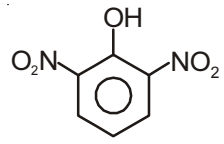
(3) Benzoic acid

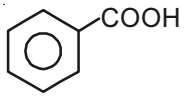
(4) Salicylic acid

80. Which of the following will be least soluble in sodium carbonate solution?

(1) 

(2) 

(3) 

(4) 

81. A compound (Y) is formed when acetaldehyde condenses with ethylamine. (Y) on further catalytic hydrogenation will yield

(1) Ethyl methyl amine

(2) Diethylamine

(3) n-butylamine

(4) Trimethylamine

82. An aliphatic amine with molar mass 73 on heating with excess of CH_3I gave a quaternary salt. Which of the following amines follows this data?

(1) N,N-diethylethanamine

(2) N-methylpropanamine

(3) 2-propanamine

(4) Neopentylamine

83. Which of the following is used in the preparation of nylon?

(1) Adipic acid (2) Butadiene

(3) Isoprene (4) Ethylene

84. In metallurgical process the flux used for removing acidic impurities is

(1) Silica

(2) Sodium chloride

(3) Lime stone

(4) Sodium carbonate

85. Which of the following carbonates decomposes most readily on heating?

(1) Na_2CO_3 (2) K_2CO_3

(3) Li_2CO_3 (4) $CaCO_3$

86. In the formation of tetramine zinc (II) cation, the hybrid orbitals used by Zn ion is

(1) sp^3d (2) dsp^2

(3) sp^3 (4) dsp^3

87. Which product will not be formed when potassium chlorate is treated with conc. H_2SO_4?

(1) ClO_2 (2) $HClO_4$

(3) $KHSO_4$ (4) Cl_2

88. Which of the following statements is/are correct for the manufacture of sulphuric acid by Contact process?

(1) V_2O_5 is used for catalytic oxidation of SO_2 to SO_3

(2) SO_3 is absorbed in concentrated sulphuric acid

(3) SO_3 is directly absorbed in water

(4) Both (1) & (2)

89. Which of the following is non-reducing in nature?

(1) Sucrose

(2) Cellulose

(3) Maltose

(4) Both (1) & (2)

90. Acetone on condensation in presence of H_2SO_4 gives

(1) Hexane (2) Mesitylene

(3) Xylene (4) Benzene

BOTANY

91. Which taxonomic category will have similar taxon in the classification of mango and wheat?
(1) Class (2) Division
(3) Order (4) Family

92. Mitotic prophase is characterised by
(1) Presence of only one chromatid in each chromosome
(2) Initiation of assembly of mitotic spindle
(3) Attachment of spindle fibres to kinetochore of chromosome
(4) Poleward movement of chromosomes

93. Out of the 20 essential amino acids in plants, which one is the key amino acid that can convert keto acid into other amino acid by the process of transamination?
(1) Alanine (2) Glutamine
(3) Glutamic acid (4) Aspartic acid

94. Stroma lamellae membrane in chloroplasts
(1) Have only PS I and NADP reductase enzyme
(2) Do not have PS II and NADP reductase
(3) Have PS I and PS II but no NADP reductase
(4) Do not have PS I and NADP reductase

95. Which of these is never released as by-product in fermentation?
(1) Formation of metabolic water as a product
(2) Evolution of CO_2
(3) Oxidation of glycolytic NADH
(4) End product of the process always organic acid

96. Flowering can be inhibited when the plants exposed to light above the critical photoperiod is
(1) Maize, tomato
(2) Rice, sugarbeet
(3) Cocklebur, sugarcane
(4) Cotton, oat

97. Single cell protein can be useful in all, **except**
(1) Reducing environmental pollution
(2) Decreasing pressure on agriculture
(3) Preventing shift from meat to grain as diet by human beings
(4) Being acceptable as food in future

98. Bioactive molecule used as an immunosuppressive agent in organ transplant is produced by
(1) *Tolypocladium inflatum*
(2) *Monascus purpureus*
(3) *Candida lipolytica*
(4) *Trichoderma polysporum*

99. Organisms that cannot maintain a constant internal environment with ambient environmental factor like temperature known as conformers did not evolve and became regulators because
(1) Heat loss and heat gain is function of surface area
(2) Thermoregulation is energetically expensive for many organisms
(3) The costs benefits of maintaining a constant internal environment are taken into consideration during the course of evolution
(4) All of these

100. Pyramid of number in tree ecosystem with predatory food chain is
(1) Triangular (2) Upright
(3) Spindle shaped (4) Inverted

101. Particulate matters in air can be removed most efficiently by the use of
(1) Catalytic converters in exhaust of automobiles
(2) Scrubbers
(3) Electrostatic precipitators
(4) Euro-III emission norms

102. Ancient bacteria differ from other bacteria in having
(1) Different cell wall structure
(2) Lipid bilayers in their cell membranes but no sterols
(3) Circular double stranded DNA without introns
(4) Anaerobic respiration

103. Non-vascular amphibians of plant kingdom are characterised by all, **except**
(1) No free living sporophyte
(2) Can help in succession on rocks
(3) Zygote divides by meiosis immediately after its formation
(4) Presence of multicellular sex organs

104. What is **incorrect** for the smallest group of plant kingdom?
(1) Male and female gametophytes are of independent free living existence
(2) Pollens are transferred by wind only
(3) Two or more archegonia developed in female gametophytes
(4) All are heterosporous

105. Which of these have diplontic life cycle?
(1) *Dryopteris*, all spermatophytes
(2) *Caulerpa* and *Marchantia*
(3) *Ginkgo* and mustard
(4) Anthophytes only

106. Thorns in *Citrus* and *Bougainvillea* are
(1) Modified axillary buds
(2) Modified leaves
(3) Small branches arising in axil of leaves
(4) Meant for reducing transpiration

107. Choose **incorrect** option w.r.t. meiosis cell division
(1) Leptotene and zygotene stages are short lived as compared to pachytene
(2) Chromosomes clearly appear as tetrads in pachytene
(3) Synaptonemal complex is dissolved in pachytene
(4) Terminalisation of chiasma completed in diakinesis

108. According to chemiosmotic hypothesis of ATP formation in chloroplast which one does **not** contribute to develop proton gradient across thylakoid membrane?
(1) Splitting of water
(2) Reduction of $NADP^+$ to NADPH + H^+
(3) Reduction of NAD^+ to NADH + H^+
(4) Removal of H^+ from stroma while transporting electron

109. Percentage of offsprings with genotype aaBbCc from a cross Aabbcc and AaBBCC would be
(1) 50% (2) 25%
(3) 12.5% (4) 37.5%

110. Basis of DNA fingerprinting lies in
(1) VNTRs (2) ESTs
(3) Hybridization (4) Autoradiography

111. In Verhulst-Pearl Logistic growth of a population
(1) Population stops abruptly due to environmental resistance
(2) Environmental resistance becomes suddenly effective
(3) Population finally achieves asymptote with the resources or carrying capacity
(4) Population faces a crash also

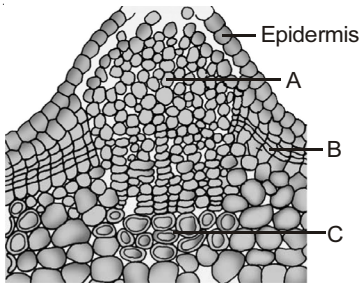
112. Which of these diversity promotes ecotype formation and speciation?
(1) Genetic diversity (2) Species diversity
(3) Ecological diversity (4) Beta diversity

113. Transcription and translation have to be tightly regulated as these processes
(1) Occur in cytoplasm of bacteria
(2) Are energetically very expensive
(3) Occur in nucleus of fruit fly
(4) Occur in plastids and mitochondria in humans

114. Select the **incorrect** match

	Plants	**Number of stamens**	**Gynoecium**
(1)	*Petunia*	5	$\underline{G}_{(2)}$
(2)	Tomato	5	$\underline{G}_{(2)}$
(3)	*Asparagus*	6	$\underline{G}_{(3)}$
(4)	*Trifolium*	10	$\underline{G}_{(2)}$

115. Consider the following figure w.r.t. secondary structure and select the right option.



(1) 'A' represents cork cells
(2) 'B' is developed after redifferentiation
(3) 'C' is developed from phellogen
(4) 'C' represents secondary phloem

116. How many diseases in the list given below are caused by virus?

Mumps, Small pox, Typhoid, Influenza, Herpes

(1) Two (2) Three
(3) Four (4) Five

117. Formation of triploid endosperm precedes development of the embryo in

a. *Ginkgo* b. Castor

c. Beans d. *Sequoia*

(1) d only (2) a & d

(3) b & c (4) All of these

118. Read the following statements w.r.t. dicot stem and select the right choice.

a. The epidermis is covered with thick layer of cuticle

b. The cells of endodermis are rich in starch grains

c. Pericycle is present on the inner side of endodermis and above the phloem in the form of semilunar patches of sclerenchyma

d. The vascular bundles are arranged in a ring

(1) c & d are incorrect

(2) b, c & d are incorrect

(3) a, b & c are correct

(4) b, c & d are correct

119. Select **incorrect** function w.r.t ethephon

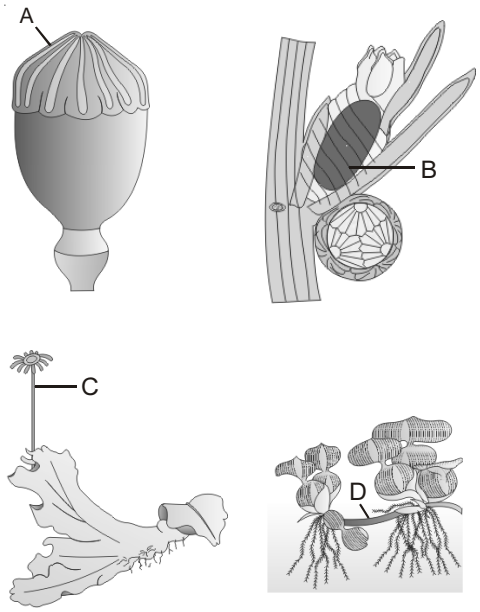
(1) Accelerates abscission in flowers

(2) Promotes female flowers in cucumber

(3) Accelerates abscission in fruits

(4) Early seed production in conifers

120. Examine the figure (A-D) given below and select the right option out of 1-4 in which all the four structures A, B, C and D are identified correctly.



(1) A – Stigma, B – Oogonium, C – Archegoniophore, D – Offset

(2) A – Stamen, B –Antheridium, C – Archegoniophore, D – Offset

(3) A – Stigma, B – Oogonium, C – Antheridiophore D – Offset

(4) A – Stamen, B – Antheridium, C – Archegoniophore, D – Stolon

121. Taylor is heterozygous for two autosomal gene pair (CcDd). He is also colour-blind. What is the probability of gametes having c, d and colour-blind genes?

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

(3) $\frac{1}{8}$ (4) $\frac{1}{16}$

122. In *lac* operon, promoter gene provides binding site for

(1) β-galactosidase

(2) Lactose

(3) Repressor protein

(4) RNA polymerase

123. Read the following statements w.r.t. predation and select the two **wrong** statements

A. Predators help in maintaining species diversity in a community

B. Predators in nature are prudent

C. Predators cannot reduce the intensity of competition among competing prey species

D. Predators do not act as conduits for energy transfer across trophic levels.

(1) A and B

(2) C and D

(3) A and C

(4) B and C

124. When a cross is made between tall garden pea plant with yellow seeds (TtYy) and tall garden pea plant with green seeds (Ttyy), what proportion of phenotype in the offspring could be expected to be tall and green?

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

(3) $\frac{1}{4}$ (4) $\frac{3}{4}$

125. Select the **incorrect** match w.r.t recent extinction of animals

(1) Quagga – Africa

(2) Thylacine – Australia

(3) Steller's sea cow – Russia

(4) Dodo – India

126. According to mass flow hypothesis of phloem transport

(1) Sucrose is loaded actively in phloem sieve tube directly from mesophyll cells

(2) Loading of sugar at source produces hypotonic condition

(3) Turgor pressure gradient between source and sink has no role in phloem transport

(4) Loading of the phloem sets up a water potential gradient that facilitates movement of sugar in mass

127. During photorespiration, the decarboxylation reaction occurs in

(1) Peroxisomes

(2) Mitochondria

(3) Chloroplast

(4) Chloroplast of bundle sheath cell

128. Which of the following is **incorrect** w.r.t. anemophily?

(1) Well exposed stamens

(2) Pollen grains are light and sticky

(3) Feathery stigma to trap pollen grains

(4) It is quite common in grasses

129. In mitochondrial electron transport system

(1) Number of ATP molecules synthesised does not depend on nature of electron donor

(2) Ubiquinone receives reducing equivalents via $FADH_2$ also

(3) Cytochrome c is a large protein attached to outer surface of inner mitochondrial membrane

(4) Complex IV has cyt. a and cyt. a_3 but no copper centres

130. Decomposition is inhibited during

(1) Warm and moist environment

(2) Low temperature and anaerobiosis

(3) Warm and aerobic environment

(4) Aerobic and slightly acidic condition

131. In India, the Air (Prevention and control of Pollution) Act came into force in 1981, but was amended in _____ to include noise as an air pollutant.

(1) 1974

(2) 1989

(3) 1987

(4) 1988

132. Mesosome helps in all the following processes, **except**

(1) Septum formation

(2) Synthesis and secretion of proteins

(3) DNA replication

(4) Respiration

133. Select the **incorrect** statement w.r.t. centrioles

(1) Cartwheel like organisation

(2) They are made up of nine evenly spaced peripheral fibrils of tubulin

(3) The central part is non-proteinaceous and called the hub

(4) They form the basal body of cilia or flagella

134. Which one of the following statements is **correct**?

(1) In onion, seeds are endospermous

(2) Placentation in *Dianthus* is basal

(3) Stamens are epipetalous in lily

(4) Epigynous flowers are found in mustard

135. Fungus with septate mycelium, parasitic to potato crop and can reproduce by asexual spores only is

(1) *Phytophthora*

(2) *Alternaria*

(3) *Claviceps*

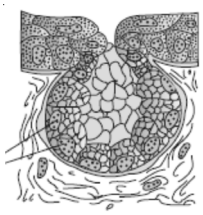
(4) *Ustilago*

ZOOLOGY

136. Which of the following is **correct** match of phylum and its distinctive feature?

Phylum		Distinctive feature
(1) Echinodermata	–	Endoskeleton is of calcareous ossicles. All are marine and have water vascular system. Excretory system is well developed.
(2) Hemichordata	–	Worm like marine animals. Circulatory system is of closed type. Respiration by gills and excretion by proboscis gland.
(3) Annelida	–	May be aquatic or terrestrial, free living and sometimes parasitic. All possess lateral appendages, parapodia which help in swimming.
(4) Aschelminthes	–	They are bilaterally symmetrical triploblastic and pseudocoelomate. Sexes are separate. Fertilisation is internal and development may be direct or indirect.

137. Given below is a diagrammatic representation of glandular epithelium.



Which of the following is a **correct** set w.r.t. the secretion of the given gland?

(1) Mucus, saliva, earwax, thyroxine

(2) Saliva, earwax, milk, oil

(3) Mucus, saliva, earwax, melatonin

(4) Maltase, sucrase, secretin, mucus

138. Read the following statements w.r.t. B-DNA

(A) Backbone is formed by the sugar-phosphate-sugar chain

(B) The two strands of polynucleotides are antiparallel

(C) At each step of ascent, the strand turns 36°

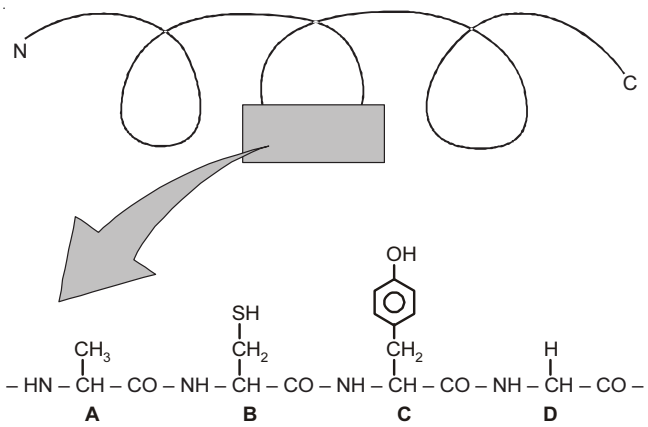
(D) The rise per base pair would be 34 Å

How many statements are correct?

(1) One (2) Two

(3) Three (4) Four

139. Given below is a primary structure of a portion of a hypothetical protein, N and C refer to the two termini of every protein.



Choose the **correct** option w.r.t. identification of amino acid labelled as **A**, **B, C** and **D**.

A	B	C	D
(1) Serine	Cysteine	Tyrosine	Alanine
(2) Serine	Cysteine	Tyrosine	Glycine
(3) Alanine	Cysteine	Tyrosine	Glycine
(4) Alanine	Cysteine	Tyrosine	Serine

140. Mark the odd one w.r.t. composition of succus entericus

(1) Dipeptidases (2) Lipases

(3) Nucleosidases (4) Amylases

141. Though heart is autoexitable, its rate can be moderated by neural and hormonal mechanisms. All of the following increase the heart rate, **except**

(1) Adrenaline (2) Noradrenaline

(3) Acetylcholine (4) Nicotine

142. Match the following

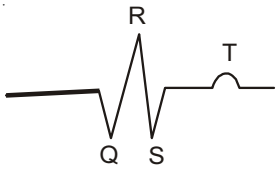
Column I		Column II
a. Tidal volume	(i)	1100 to 1200 ml
b. Inspiratory reserve volume	(ii)	500 ml
c. Expiratory reserve volume	(iii)	2500 ml to 3000 ml
d. Residual volume	(iv)	1000 ml to 1100 ml

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

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

143. The blood group in which both antigens (A and B) present on the surface of RBC is
(1) A (2) B
(3) O (4) AB

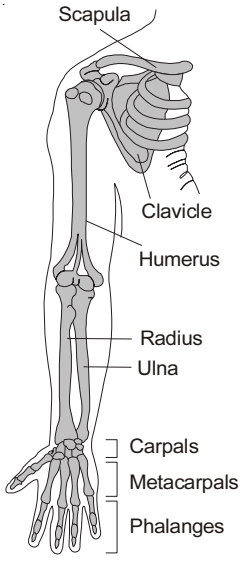
144. Given below is a diagrammatic representation of ECG of a patient



Which of the following nodal tissues must be damaged in patient's heart?
(1) SA node (2) AV node
(3) Bundle of His (4) Purkinje fibre

145. In the following ducts, the moving fluid is urine. However one of them is an exception choose the exception
(1) Collecting duct
(2) Renal pelvis
(3) Distal convoluted tubules
(4) Ureter

146. Given below is a diagrammatic representation of right pectoral girdle and upper arm.



Choose the **correct** option which includes incorrectly labelled bone?
(1) Radius and ulna
(2) Carpals and metacarpals
(3) Scapula and clavicle
(4) Humerus and carpals

147. In striped muscles, cross bridges rapidly dissociates when
(1) ADP and inorganic phosphate separate from myosin head
(2) ATP attaches to myosin head
(3) Calcium binds to tropomyosin
(4) Troponin tropomyosin complex masks the active binding sites for myosin on the actin filaments

148. All the following structures are found in an electrical synapse, **except**.
(1) Gap junction
(2) Synaptic vesicles
(3) Presynaptic membrane
(4) Post-synaptic membrane

149. Given below is a list of hormonal disorders
(a) Acromegaly (b) Myxedema
(c) Addison's disease (d) Diabetes mellitus
How many of them is/are the disorders due to hypersecretion?
(1) One (2) Two
(3) Three (4) Four

150. During cleavage all of the following increase, **except**
(1) Number of cells
(2) Nuclear cytoplasmic ratio
(3) Size of cell/blastomere
(4) Metabolism

151. The assisted reproductive technology, in which embryo formed by *in-vivo* fertilisation?
(1) ZIFT (2) IVF-ET
(3) IUT (4) GIFT

152. In which of the following diseases, *Aedes* mosquito acts as vector/carrier?
(1) Malaria, dengue and filaria
(2) Dengue, chikungunya and yellow fever
(3) Dengue, kala-azar and sleeping sickness
(4) Diphtheria, tetanus and pertussis

153. Diacetyl morphine is commonly called
(1) Smack (2) Crack
(3) Coke (4) Speed ball

154. Choose the **incorrect** option w.r.t. origin and evolution of life
(1) The first cellular forms of life were probably chemoheterotrophic prokaryotes
(2) Charles Darwin concluded that existing living forms share similarities to varying degrees not only among themselves but also with life forms that existed millions of years ago
(3) According to Darwin variations are small and directionless
(4) Evolution for Darwin was gradual while de-Vries believed mutation caused speciation

155. Among the given statements one is wrong for competitive inhibition

(1) Competitive inhibition is often used to control bacterial pathogens

(2) Competitive inhibitors closely resemble the substrate in its molecular structure

(3) Competitive inhibitors link to the enzyme through covalent linkage

(4) Competitive inhibitors do not affect V_{max} of the reaction if K_m of the reaction is increased

156. Given below are four statements (I-IV) regarding human blood circulatory system

(I) Veins possess thick walls and a narrow lumen

(II) In the treatment of angina NO and nitroglycerine is recommended

(III) Duration of cardiac cycle can be altered depending on metabolic needs of a person

(IV) Heart failure can be treated with the help of pacemakers

How many of the above are correct statements?

(1) I only (2) II & III

(3) III & IV (4) I & IV

157. In a standard ECG, the T wave denotes

(1) Depolarisation of atria

(2) Depolarisation of AV node

(3) Repolarisation of ventricles

(4) Start of atrial systole

158. Antidiuretic hormone does not deal with

(1) Vasoconstriction of blood vessels

(2) Prevention of diuresis

(3) Excitation of osmoreceptors on detecting increase in body fluid volume

(4) Increase in water absorption from DCT and collecting duct

159. In which one of the following the genus name, its two characters and its class/phylum are **correctly** matched?

	Genus name	Two characters	Class/phylum
(1)	*Pteropus*	(a) Body covered by hair (b) Oviparous	Reptiles
(2)	*Chameleon*	(a) Pentadactyl limbs (b) Prehensile tail	Reptiles
(3)	*Torpedo*	(a) Electric organs (b) Four pairs of gill slits	Chondrichthyes
(4)	*Scoliodon*	(a) Lateral line system (b) Ampullae of lorenzini	Osteichthyes

160. Mark the correct option for tissue, location and function

	Tissue	Location	Function
(1)	Reticular tissue	Spleen	Support
(2)	Brush bordered cuboidal epithelium	PCT	Absorption
(3)	Neurosensory epithelium	Taste buds and cornea	Conversion of all types of stimuli to electrical stimuli
(4)	Glandular epithelium	Lining of blood vessels	To handle blood pressure

161. One amongst the following hormones in excess is considered as diabetogenic hormones

(1) Insulin (2) Cortisol

(3) Thyroxine (4) Aldosterone

162. Pineal gland secretes a hormone melatonin, plays a very important role in the following, **except**

(1) Regulate diurnal rhythm of our body

(2) Regulate body temperature

(3) Deal with skin pigmentation

(4) Stimulate gonadal function

163. The process of formation of a mature female gamete is called oogenesis, for which one amongst the following statements is incorrect?

(1) A primary follicle carries primary oocyte that has entered meiosis I

(2) The primary follicle surrounded by many layers of granulosa cells and a new theca is called secondary follicle

(3) At puberty about 60,000–80,000 primary follicles are lost by atresia

(4) After the formation of tertiary follicle the primary oocyte completes its first meiotic division

164. One amongst the following may not be considered as the outcome of an undetected STD

(1) Pelvic inflammatory diseases

(2) Ectopic pregnancies

(3) Abortions and still births

(4) Lactational amenorrhoea

165. Following examples show analogy, **except**

(1) Eye of *Octopus* and eye of mammal

(2) Flippers of penguins and dolphins

(3) Sweet potato and potato

(4) Thorn of *Bougainvillea* and tendril of *Cucurbita*

166. The common ancestors of seed ferns and progymnosperms are _____ that appeared towards the end of _____ period.
(1) Chlorophyta, Devonian
(2) *Psilophyton*, Silurian
(3) Sphenopsids, Carboniferous
(4) *Zosterophyllum*, Jurassic

167. Adaptive radiation of a species in an isolated geographical area is possible when
(1) Biotic potential of the species is limited
(2) The resource is unlimited and superior competitors are absent
(3) Reproductive fitness of all the resident species is comparable
(4) Nature is favourable to one extreme of a trait in an array of phenotypes

168. The ability of *Agrobacterium tumifaciens* to behave as a natural genetic engineer is because of
(1) Its ability to secrete opines
(2) Its ability to link its prokaryotic DNA with eukaryotic DNA without human interference
(3) Its ability to infect injured dicot plants
(4) Presence of vir gene in its Ti plasmid, that produces tumour

169. A genetically engineered micro-organism used successfully in bioremediation of oil spills is a species of
(1) *Xanthomonas* (2) *Pseudomonas*
(3) *Bacillus* (4) *Trichoderma*

170. Use of IUDs within 72 hours of coitus, as emergency contraceptive is mainly aimed at
(1) Preventing sperm ascent
(2) Preventing mating of sperm and ovum
(3) Preventing implantation
(4) Killing of sperms

171. In response to decrease in blood volume and blood pressure which of the following does not occur?
(1) Increase in level of Aldosterone
(2) Increase in the level of ADH
(3) Increase in level of Renin
(4) Increase in the level of ANF

172. Find the mismatch
(1) Joint between carpal and metacarpal of thumb – Gliding joint
(2) Joint between humerus and pectoral girdle – Ball and Socket joint
(3) Hinge joint – Elbow joint
(4) Joint between Atlas and Axis – Pivot joint

173. The regulation of sexual behaviour, expression of emotional reactions and motivation is the function of
(1) Corpora quadrigemina
(2) Basal ganglia
(3) Limbic system
(4) Cerebrum and hypothalamus

174. Damage of suspensory ligaments of eye will affect
(1) Ability to see colours
(2) Ability to absorb dazzling effect of light
(3) Accommodation property of eye
(4) The texture of lens

175. Humoral immune response of body
(1) Deals with cellular immune response
(2) Is stimulated by Tcells
(3) Is mainly responsible for Graft rejection
(4) Promotes the increased activity of neutrophils

176. Type of antibody that remains attached to mucus membranes of body is
(1) IgA (2) IgM
(3) IgD (4) IgG

177. Mark the correct combination of drugs which quickly reduce the symptoms of allergy
(1) Histamine, serotonin, heparin
(2) Antihistamine, adrenaline, steroids
(3) Adrenaline, noradrenaline, histamine
(4) Interferon, adrenaline, steroids

178. Mark the non-invasive technique without any side effects to diagnose the cancer of internal organs
(1) Radiography
(2) Computed tomography
(3) Histopathological studies
(4) Magnetic resonance imaging

179. Change of frequency of alleles in a population would be expected in a population if it
(1) Shows no genetic drift
(2) Shows no selection
(3) Is evolving
(4) Shows no gene flow

180. The importance of gas bubbles in sparged tank reactor is that
(1) Gas bubbles are meant for sterilisation of the culture
(2) Bubbles dramatically increase the oxygen transfer area
(3) Bubbles help in purification of culture
(4) Bubbles help in easy release of product from sampling port

❑ ❑ ❑

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MOCK TEST for AIPMT-2016

ANSWERS

1.	(4)	37.	(1)	73.	(2)	109.	(2)	145.	(3)
2.	(2)	38.	(2)	74.	(4)	110.	(1)	146.	(3)
3.	(4)	39.	(4)	75.	(1)	111.	(3)	147.	(2)
4.	(2)	40.	(4)	76.	(1)	112.	(1)	148.	(2)
5.	(2)	41.	(2)	77.	(4)	113.	(2)	149.	(1)
6.	(3)	42.	(2)	78.	(1)	114.	(4)	150.	(3)
7.	(1)	43.	(2)	79.	(4)	115.	(3)	151.	(4)
8.	(4)	44.	(1)	80.	(1)	116.	(3)	152.	(2)
9.	(4)	45.	(4)	81.	(2)	117.	(3)	153.	(1)
10.	(4)	46.	(4)	82.	(2)	118.	(4)	154.	(3)
11.	(2)	47.	(3)	83.	(1)	119.	(4)	155.	(3)
12.	(4)	48.	(2)	84.	(3)	120.	(1)	156.	(2)
13.	(3)	49.	(3)	85.	(3)	121.	(3)	157.	(3)
14.	(3)	50.	(2)	86.	(3)	122.	(4)	158.	(3)
15.	(3)	51.	(4)	87.	(4)	123.	(2)	159.	(2)
16.	(3)	52.	(2)	88.	(4)	124.	(1)	160.	(2)
17.	(3)	53.	(2)	89.	(4)	125.	(4)	161.	(2)
18.	(3)	54.	(2)	90.	(2)	126.	(4)	162.	(4)
19.	(1)	55.	(1)	91.	(2)	127.	(2)	163.	(3)
20.	(2)	56.	(4)	92.	(2)	128.	(2)	164.	(4)
21.	(2)	57.	(2)	93.	(3)	129.	(2)	165.	(4)
22.	(2)	58.	(2)	94.	(2)	130.	(2)	166.	(2)
23.	(2)	59.	(1)	95.	(1)	131.	(3)	167.	(2)
24.	(1)	60.	(1)	96.	(3)	132.	(2)	168.	(2)
25.	(2)	61.	(2)	97.	(3)	133.	(3)	169.	(2)
26.	(4)	62.	(1)	98.	(4)	134.	(1)	170.	(3)
27.	(1)	63.	(2)	99.	(4)	135.	(2)	171.	(4)
28.	(2)	64.	(1)	100.	(3)	136.	(4)	172.	(1)
29.	(3)	65.	(3)	101.	(3)	137.	(2)	173	(3)
30.	(1)	66.	(4)	102.	(1)	138.	(3)	174.	(3)
31.	(3)	67.	(4)	103.	(3)	139.	(3)	175.	(2)
32.	(1)	68.	(3)	104.	(1)	140.	(4)	176.	(1)
33.	(4)	69.	(1)	105.	(3)	141.	(3)	177.	(2)
34.	(3)	70.	(1)	106.	(1)	142.	(2)	178.	(4)
35.	(4)	71.	(1)	107.	(3)	143.	(4)	179.	(3)
36.	(3)	72.	(2)	108.	(3)	144.	(1)	180.	(2)