Aakash
Medical | IIT-JEE | Foundations
(Divisions of Aakash Educational Services Limited)

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MM : 720

Mock Test for NEET-2019
Test-II

Time : 3 Hrs.

Complete Syllabus of Class XI & XII

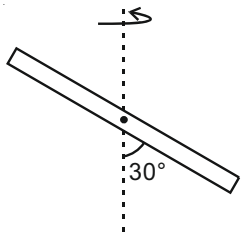
Instructions :

(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. The moment of inertia of a uniform rod of length '$2l$' and mass 'm' about an axis through centre and inclined at an angle 30° to the rod as shown in the figure is



(1) $\frac{ml^2}{6}$
(2) $\frac{ml^2}{3}$
(3) $\frac{4ml^2}{9}$
(4) $\frac{ml^2}{12}$

2. A string is wrapped around a wheel of radius 'r'. The axis of the wheel is horizontal and its moment of inertia about the axis is I. Weight 'mg' is tied to free end at the string which is released to fall down from rest position. The angular velocity of wheel after weight has fallen through distance 'h' will be

(1) $\left(\frac{2mgh}{I+mr^2}\right)^{\frac{1}{2}}$
(2) $\left(\frac{2gh}{I+mr^2}\right)^{\frac{1}{2}}$
(3) $\sqrt{2gh}$
(4) $\left(\frac{2gh}{2I+mr^2}\right)$

3. A seconds pendulum is arranged in a lift. If the lift is moving down with an acceleration $\left(\frac{g}{2}\right)$, then its new time period will be

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

4. A segment of wire vibrates with fundamental frequency 400 Hz under a tension of 8 kg weight. The tension at which the fundamental frequency of same wire becomes 800 Hz is

(1) 16 kg-weight
(2) 32 kg-weight
(3) 12 kg-weight
(4) 24 kg-weight

5. Two tuning forks have frequency 300 Hz and 308 Hz. When they are sounded together, after hearing the maximum sound, how long will it take to hear the first minimum sound?

(1) $\frac{1}{16}$ s (2) $\frac{1}{8}$ s

(3) $\frac{1}{4}$ s (4) $\frac{1}{12}$ s

6. A transverse wave of amplitude 20 cm wavelength 50 cm and frequency 4 Hz is propagating over a taut string in the negative x direction. The equation of this wave will be best described by (where t is in s and x is in m)

(1) $y = 0.2 \sin(4\pi x - 8\pi t)$ m

(2) $y = 0.2 \sin(4\pi x + 8\pi t)$ m

(3) $y = 0.2 \sin(2\pi x - 4\pi t)$ m

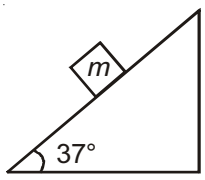
(4) $y = 0.2 \sin(2\pi x + 4\pi t)$ m

7. The pressure at the bottom of a open water tank $3P_0$ where P_0 is atmospheric pressure. If water is drawn out till the water level decreases by $\frac{2}{3}$rd, then pressure at the bottom of the tank will be

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

(3) $\frac{5P_0}{2}$ (4) $\frac{5P_0}{3}$

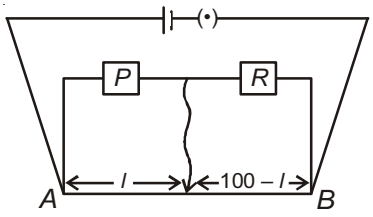
8. A block of mass m is sliding down on a rough fixed inclined plane having coefficient of friction ($\mu = 0.5$) as shown in the figure. The acceleration of the block is (Take $g = 10$ m/s^2)



(1) 2 m/s^2 (2) 4 m/s^2

(3) 8 m/s^2 (4) 6 m/s^2

9. In the given meter bridge diagram, the balancing length is l = 65 cm when P = 5 Ω. Now when an unknown resistance X is connected with P in series then balancing length becomes l = 70 cm. The value of X is nearly



(1) 0.6 Ω (2) 1.3 Ω

(3) 2.8 Ω (4) 3.2 Ω

10. A physical quantity P is described by the relation $P = a^{\frac{1}{2}} b^2 c^2 d^{-2}$. If percentage error in measurement of a, b, c and d are 4%, 1%, $\frac{1}{2}$% and 2% respectively, then the maximum percentage error in P will be

(1) 5% (2) 9%

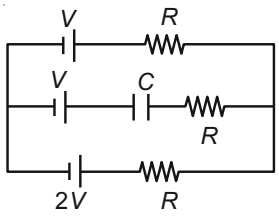
(3) 6% (4) 3%

11. A body cools from 65°C to 55°C in 8 minutes in a room at temperature 30°C. Temperature of the body at the end of next 8 minutes will be

(1) 41°C (2) 42°C

(3) 47.8°C (4) 50°C

12. In the given circuit, with steady current, the potential drop across the capacitor will be



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

(3) V (4) 2V

13. A particle is moving on circular path with decreasing speed. Select the correct statement.

I. Angular momentum about centre of path remains constant.

II. Linear momentum remains constant.

III. The direction of angular momentum about centre of path remains constant.

(1) I & III only

(2) II only

(3) II & III only

(4) III only

14. A simple pendulum of length l_1 has time period of 5 s and another simple pendulum of length l_2 has time period 3 s. Then the time period of another pendulum of length $(l_1 - l_2)$ is

(1) 7 s (2) 4 s

(3) 5 s (4) 3 s

15. A 5 kg block is sliding on rough horizontal surface with speed 10 m/s at the moment when it just starts compressing a uncompressed spring of spring constant 400 N/m. If kinetic friction force between the block and surface is 10 N, then the spring is compressed by nearly

(1) $\left(\frac{\sqrt{31}-1}{4}\right)$ m

(2) $\left(\frac{\sqrt{31}+2}{40}\right)$ m

(3) $\left(\frac{20\sqrt{5}-1}{40}\right)$ m

(4) $\left(\frac{\sqrt{20}-1}{40}\right)$ m

16. A uniform rod of length *l*, hinged at one end is free to rotate in the vertical plane. If the rod is held horizontal in the beginning and released, then angular velocity of the rod when it makes an angle of 60° with the vertical for first time is

(1) $\sqrt{\frac{6g}{l}}$ (2) $\sqrt{\frac{3g}{2l}}$

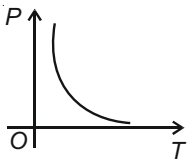
(3) $\sqrt{\frac{2g}{l}}$ (4) $\sqrt{\frac{g}{l}}$

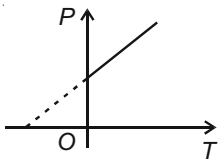
17. An electron is orbiting in 4th orbit in a hydrogen atom. The de-Broglie's wavelength associated with this electron is nearly

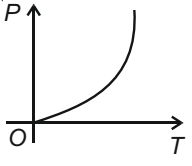
(1) 1.32 Å (2) 13.2 Å

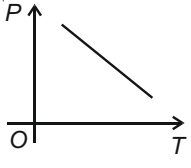
(3) 15.6 Å (4) 20 Å

18. The graph of pressure versus temperature (*P*-*T*) for adiabatic process is best described by (use adiabatic constant $\gamma = \frac{3}{2}$)

(1) 

(2) 

(3) 

(4) 

19. During a transition in a hydrogen atom a photon of energy 13.06 eV is emitted. The change in the angular momentum of electron which takes part in this transition is equal to

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

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

20. 50 g of steam at 100°C is passed into a large block of ice at 0°C the mass of ice that melts is

(1) 200 g (2) 400 g

(3) 300 g (4) 600 g

21. A plano convex lens fits exactly into a plano concave lens. Their plane surface are parallel to each other. If lenses are made of different materials of refractive indices $\frac{7}{4}$ and $\frac{3}{2}$ and radius of curvature of the curved surfaces of the lens is 10 cm then focal length of the combination will be

(1) 20 cm (2) 60 cm

(3) 40 cm (4) 30 cm

22. A plane mirror is placed at origin parallel to *y*-axis, facing the positive *x*-axis. An object starts from (4m, 0, 0) with velocity $(3\hat{i}+2\hat{j})$ m/s. The relative velocity of image w.r.t object will be

(1) $(-6\hat{i}-2\hat{j})$ m/s (2) $(-3\hat{i}-2\hat{j})$ m/s

(3) $-6\hat{i}$ m/s (4) $-4\hat{j}$ m/s

23. In Young's double slit experiment, the ninth maxima of wavelength λ_1 is at a distance y_1 from the central maxima. When the wavelength of source is changed to λ_2, 5th minima is at a distance y_2 from central maxima. The value of $\frac{y_1}{y_2}$ will be

(1) $\frac{2\lambda_1}{\lambda_2}$ (2) $\frac{\lambda_1}{2\lambda_2}$

(3) $\frac{3\lambda_1}{2\lambda_2}$ (4) $\frac{\lambda_1}{\lambda_2}$

24. A slit of width *d* is illuminated by a light of wavelength (λ = 6000 Å). If the first minima falls at θ = 30°, then value of *d* will be

(1) 1.2 micron (2) 6×10^{-4} mm

(3) 3250 Å (4) 12×10^{-4} m

25. A parallel plate capacitor has a plate area A and separation d. A battery charges the plates to a potential difference V_0. The battery is now disconnected and a dielectric slab of dielectric constant k, thickness $\frac{d}{2}$ and area A is introduced. The ratio of energy stored in the capacitor before and after the slab is introduced will be

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

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

26. A charged particle having charge q is moving in a circle of radius R with uniform speed v. The associated magnetic moment is given by

(1) $\frac{qRv}{2}$ (2) $\frac{qR^2v}{2}$

(3) qR^2v (4) qRv

27. Average energy density in electromagnetic wave is associated

(1) Only with electric field

(2) Only with magnetic field

(3) With both electric and magnetic field but more with electric field than magnetic field

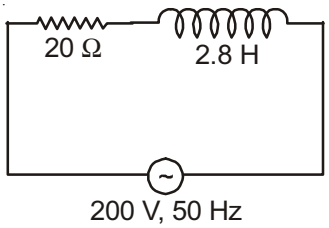
(4) With both electric and magnetic field equally

28. A particle of mass m is thrown with velocity v making an angle 30° with vertical. The change in momentum from departure to arrival along vertical direction is

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

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

29. An LR circuit, consists of R = 20 Ω and inductance of 2.8 H. An AC voltage 200 V and frequency 50 Hz is applied to the circuit. The current in the circuit is approximately



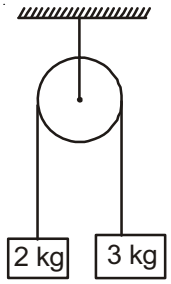
(1) 0.23 A

(2) 0.76 A

(3) 1.24 A

(4) 1.89 A

30. In a given system of masses, the net work done by the tension during the fourth second after the system is released from rest, will be (g = 10 m/s^2)



(1) 40 J (2) 100 J

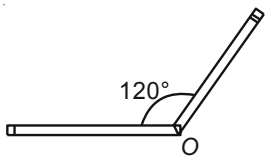
(3) Zero (4) 150 J

31. A magnetising field of 2 × 10^3 Am^{-1} produces a net magnetic flux density of $\frac{176}{7}$ T in an iron rod. The relative permeability of the rod, is

(1) 10^2 (2) 10^3

(3) 10^4 (4) 10^{-3}

32. A thin uniform rod of length L is bent at its mid point as shown in figure. The distance of centre of mass from the point 'O' is



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

(3) $\frac{L}{8}$ (4) $\frac{L\sqrt{3}}{4}$

33. An ideal heat engine operates in Carnot cycle between 227°C and 127°C. It absorbs 6 kcal of heat per cycle at higher temperature. The amount of heat that is converted into useful work per cycle is

(1) 0.6 kcal

(2) 1.2 kcal

(3) 1.8 kcal

(4) 2.4 kcal

34. A small circular loop of radius r is placed inside a large circular loop of radius R ($R >> r$). The loops are coplanar and their centres coincide. The mutual inductance of the system is proportional to

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

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

35. If two moles of an ideal monatomic gas at temperature T_0 are mixed with 4 moles of an ideal diatomic gas at temperature $2T_0$, then the temperature of the mixture is

(1) $\frac{9}{5}T_0$ (2) $\frac{17}{13}T_0$

(3) $\frac{23}{13}T_0$ (4) $\frac{13}{2}T_0$

36. The objective lens of a compound microscope produces magnification of 10. In order to get an over all magnifying power of 100 when image is formed at 25 cm from eye, the focal length of the eye lens should be

(1) 9 cm (2) $\frac{10}{3}$cm

(3) $\frac{25}{9}$cm (4) 4 cm

37. Escape velocity from the surface of a planet is v_e. A tunnel is dug across the diameter of the planet and a ball is dropped into it. When the body reaches the centre of the planet, its speed is

(1) $\frac{v_e}{2}$ (2) $\frac{v_e}{\sqrt{2}}$

(3) $\sqrt{2}v_e$ (4) Zero

38. The component of vector $\vec{A} = 2\hat{i} + 3\hat{j}$ along the direction $(\hat{i} + \hat{j})$ and $(\hat{i} - \hat{j})$ will be

(1) $\left(\frac{5}{\sqrt{2}}, -\frac{1}{\sqrt{2}}\right)$ (2) $\left(\frac{5}{2}, -\frac{1}{2}\right)$

(3) $\left(-\frac{5}{\sqrt{2}}, \frac{1}{\sqrt{2}}\right)$ (4) $\left(2, \frac{1}{2}\right)$

39. A conducting ring of radius 0.4 m is placed in a time varrying magnetic field B = $\left(2 + \frac{3t^2}{\pi}\right)$ (where B is in tesla and t is in s) in such a way that its axis making an angle 60° with magnetic field. The emf induced in the ring at $t = 2$ s will be

(1) 0.48 V (2) 0.96 V

(3) 0.36 V (4) 0.72 V

40. If the coefficient of mutual induction of the primary and secondary coils of an induction coil is 4 H and a current 8 A is cut off in 4×10^{-3} s in primary coil, the average emf induced in the secondary coil will be

(1) 8 kV (2) 4 kV

(3) 800 V (4) 400 V

41. Two particles each of mass m and charge q are placed at a distance of 8 cm. If they do not experience any net force the value of $\frac{m}{q}$ is

(1) $\sqrt{4\pi\varepsilon_0 G}$

(2) $\sqrt{\frac{\pi\varepsilon_0}{G}}$

(3) $\sqrt{\frac{G}{4\pi\varepsilon_0}}$

(4) $\sqrt{\frac{1}{4\pi\varepsilon_0 G}}$

42. When 1 centimetre thick metallic surface is illuminated with light of wavelength λ, the stopping potential is V. When the same surface is illuminated by wavelength 3λ, the stopping potential is $\frac{V}{4}$. The threshold wavelength for the metallic surface will be

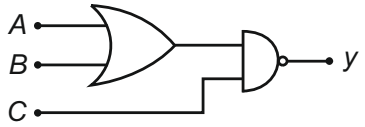
(1) 4λ

(2) 6λ

(3) 9λ

(4) 7λ

43. The output of the given logic gate will be



(1) $y = \bar{A} \cdot \bar{B} + \bar{C}$ (2) $y = \bar{A} \cdot \bar{C} + \bar{B}$

(3) $y = A \cdot B + C$ (4) $y = B \cdot C + \bar{A}$

44. To measure light instensity we use

(1) Photodiode with reverse bias

(2) LED with reverse bias

(3) Photodiode with forward bias

(4) LED with forward bias

45. Suppose the daughter nucleus in a nuclear decay is itself radioactive. If λ_1 and λ_2 denotes decay constants of daughter and parent nuclei respectively and N_1 and N_2 the number of daughter and parent nuclei present at a time, then the number of daughter nuclei becomes constant when

(1) $\lambda_1 N_2 = \lambda_2 N_1$

(2) $\lambda_1 N_1 = \lambda_2 N_2$

(3) $N_2 - N_1 = \lambda_2 - \lambda_1$

(4) $N_2 + N_1 = \lambda_2 + \lambda_1$

CHEMISTRY

46. Orbital angular momentum of 4*d* orbital is

(1) $\frac{2h}{\pi}$ (2) $\sqrt{6}\frac{h}{2\pi}$

(3) $\sqrt{3}\frac{h}{2\pi}$ (4) Zero

47. If molality of methanol in water is 5 then the mass percentage of methanol in the solution is

(1) 21.5% (2) 10.5%

(3) 13.8% (4) 27.2%

48. The pair of elements which does not show diagonal relationship is

(1) Li and Mg (2) Be and Al

(3) Mg and B (4) B and Si

49. Which among the following is a planar molecule?

(1) $(CH_3)_3N$ (2) XeF_4

(3) SF_4 (4) H_2SO_3

50. Correct order of covalent character of given halides is

(1) $AlF_3 > AlCl_3 > AlBr_3$ (2) $AlCl_3 > AlBr_3 > AlF_3$

(3) $AlF_3 > AlBr_3 > AlCl_3$ (4) $AlBr_3 > AlCl_3 > AlF_3$

51. Aqueous solution of which salt will be alkaline in nature?

(1) NH_4Br (2) $CuCl_2$

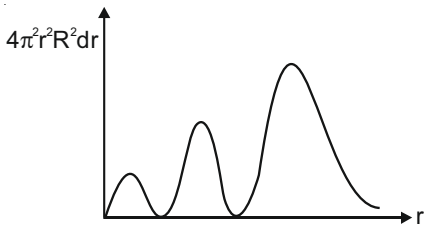
(3) CH_3OONa (4) $AlCl_3$

52. If one mole of CO(g) is oxidised to CO_2(g) in presence of oxygen then the difference of heat change at constant pressure and heat change at constant volume will be

(1) –RT (2) $-\frac{RT}{2}$

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

53. The following graph is plotted for *ns*-orbital



The value of 'n' is

(1) 1 (2) 2

(3) 3 (4) 4

54. Which among the following complex has highest value of spin only magnetic moment?

(1) $Ni(CO)_4$ (2) $[PtCl_4]^{2-}$

(3) $[NiCl_4]^{2-}$ (4) $[CuCl_4]^{2-}$

55. For a weak 0.01 M monobasic acid, van't Hoff factor will be (pK_a of acid = 4)

(1) 1.01 (2) 1.02

(3) 1.10 (4) 1.20

56. Mole of thiosulphate ions required to react completely with one mole of permanganate ion in faintly alkaline medium is

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

(3) $\frac{3}{8}$ (4) $\frac{3}{7}$

57. Which has maximum solubility among AB, AB_2, AB_3 and AB_4, if K_{sp} for all the salts is 10^{-10}?

(1) AB (2) AB_2

(3) AB_3 (4) AB_4

58. Approximate percentage of carbon in pig iron obtained from blast furnace is

(1) 1% (2) 8%

(3) 4% (4) 10%

59. 99% of a first order reaction is completed in 32 minutes. Time required for 99.9% completion is

(1) 50 minutes (2) 46 minutes

(3) 48 minutes (4) 64 minutes

60. Which among the following is not a condensation polymer?

(1) Buna-N

(2) Nylon-6

(3) Terylene

(4) Glyptal

61. One mole of a perfect gas expands isothermally to ten times its original volume. The change in entropy is

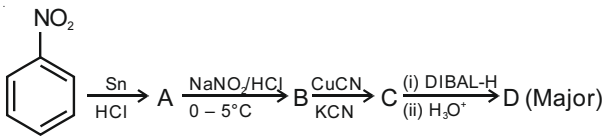
(1) 0.1 R

(2) 2.303 R

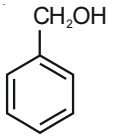
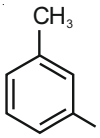
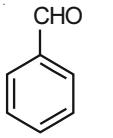
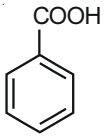
(3) 10.5 R

(4) 10 R

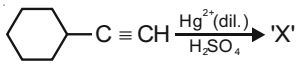
62. Consider the following reaction

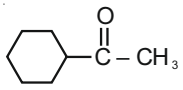
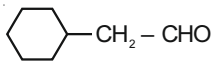
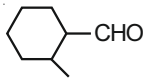
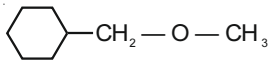


Major product is

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

63. Major product 'X' in the following reaction is

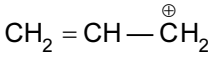
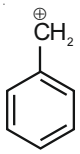
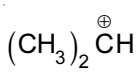
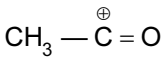


(1) 
(2) 
(3) 
(4) 

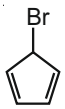
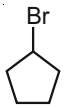
64. An element with atomic number 52 belongs to

(1) *s*-block (2) *p*-block
(3) *d*-block (4) *f*-block

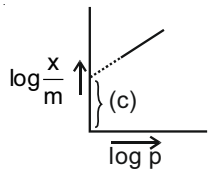
65. Most stable carbonium ion among the following is

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

66. The compound which will react fastest with aqueous $AgNO_3$ solution is

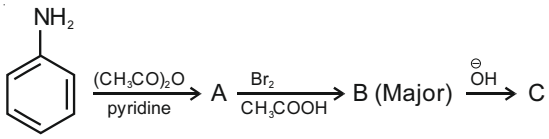
(1) 
(2) 
(3) 
(4) 

67. For the given adsorption isotherm, intercept (c) is

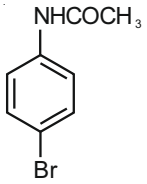
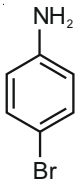
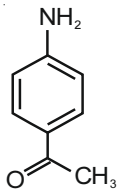
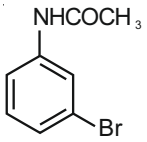


(1) $\log\frac{1}{n}$ (2) log k
(3) $\log\frac{1}{k}$ (4) log n

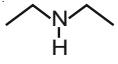
68. Consider the following reaction.



Product C is

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

69. The compound which will not react with Hinsberg's reagent is

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

70. Cellulose is composed of

(1) α-D-glucose units (2) β-D-glucose units

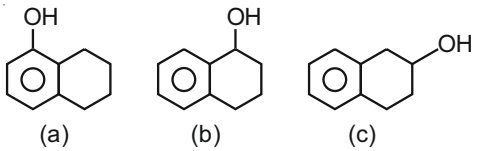
(3) β-D-galactose units (4) β-D-fructose units

71. Which among the following is not an essential amino acid?

(1) Threonine (2) Arginine

(3) Valine (4) Proline

72. Order of rate of acid catalysed dehydration of the following compound is



(a) (b) (c)

(1) a > b > c (2) b > c > a

(3) a > c > b (4) c > b > a

73. 1 poise is

(1) 10^{-2} kg $m^{-1}s^{-1}$ (2) 10^{-1} kg $m^{-1}s^{-1}$

(3) 10^{-3} kg $m^{-1}s^{-1}$ (4) 10^{-4} kg $m^{-1}s^{-1}$

74. At what temperature root mean square speed of SO_2 molecule is same as that of oxygen at 27ºC?

(1) 300 K (2) 600 K

(3) 1200 K (4) 1800 K

75. Compressibility factor of one mole of a real gas at high pressure will be

(1) $\left(1-\frac{RT}{Pb}\right)$ (2) $\left(1+\frac{Pb}{RT}\right)$

(3) $\left(1+\frac{P}{bRT}\right)$ (4) $\frac{Pb}{RT}$

76. ZSM-5 converts

(1) Alcohol to Petrol (2) Benzene to Toluene

(3) Toluene to Benzene (4) Heptane to Toluene

77. Alitame is an

(1) Antifertility drug (2) Antibiotic

(3) Analgesic (4) Artificial sweetener

78. Which of the following alkaline earth metal does not exhibit colour in flame?

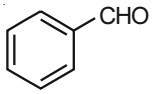
(1) Ba

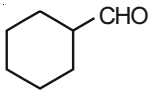
(2) Ca

(3) Sr

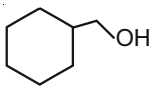
(4) Mg

79. The compound which will not give addition product with $NaHSO_3$ is

(1) 

(2) 

(3) 

(4) 

80. (C – O) bond length is maximum in

(1) CO_2 (2) CO_3^{2-}

(3) $R-\overset{O}{\overset{\|}{C}}-O^-$ (4) CO

81. Most basic compound among the following is

(1) $Er(OH)_3$ (2) $Gd(OH)_3$

(3) $Sm(OH)_3$ (4) $Ce(OH)_3$

82. 20 ml of a sample of H_2O_2 gives 400 ml of oxygen at NTP. The volume strength of sample is

(1) 5 vol (2) 10 vol

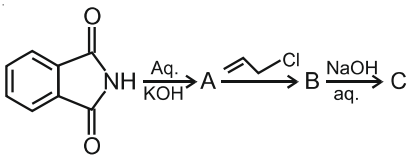
(3) 20 vol (4) 30 vol

83. Al—Cl—Al bond angle in Al_2Cl_6 is

(1) 90° (2) 120°

(3) 101° (4) 110°

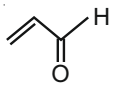
84. Consider the following reaction

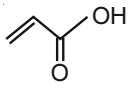


Product C is

(1) 

(2) 

(3) 

(4) 

85. Incorrect statement among the following is

(1) Beryllium does not exhibit coordination number more than four

(2) Beryllium oxide is amphoteric in nature

(3) Beryllium sulphate is less soluble than calcium sulphate in water

(4) Beryllium nitrate on heating gives NO_2 gas

86. Number of Cr — O — Cr bond(s) present in dichromate ion is

(1) 6 (2) 1

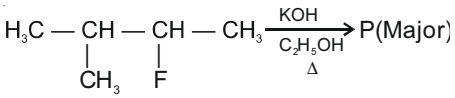
(3) 4 (4) 0

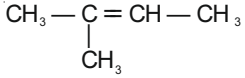
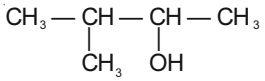
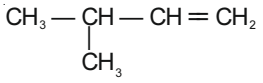
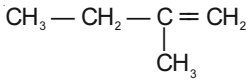
87. Approximate percentage of lanthanoid in mischmetal is
(1) 85% (2) 75%
(3) 95% (4) 50%

88. Correct order of decreasing field strength of the given ligands is
(1) $\bar{C}N > CO > en$ (2) $CO > \bar{C}N > en$
(3) $en > CO > \bar{C}N$ (4) $CO > en > \bar{C}N$

89. A metal crystallises in BCC unit cell. If the edge length of unit cell is 300 pm then the radius of the metal atom in pm is
(1) $150\sqrt{3}$
(2) $75\sqrt{3}$
(3) $75\sqrt{2}$
(4) $150\sqrt{2}$

90. Major product of the given reaction is



Major product P is
(1) 
(2) 
(3) 
(4) 

BOTANY

91. Fungal group to which *Penicillium* belongs shows similarity with the fungal group in which *Alternaria* is placed in
(1) Having aseptate mycelium
(2) Lacking endogenously produced sexual spores
(3) Having exogenously produced asexual spores
(4) Having short lived dikaryophase

92. Protists which float passively in water current
(1) Are heterotrophic organisms
(2) Have mixotrophic mode of nutrition
(3) Aggregate to form plasmodium under favourable conditions
(4) Have indestructible cell wall

93. Read the following statements
(a) Single stranded RNA as genetic material
(b) Helical arrangement of capsomeres
(c) Presence of envelope
(d) Crystallised by W.M. Stanley
Select the **correct** statements for tobacco mosaic virus (TMV)
(1) Only (a) (2) Only (b) and (c)
(3) Only (a) and (d) (4) All except (c)

94. Which of the following algae is used in commercial production of agar?
(1) *Porphyra* (2) *Laminaria*
(3) *Gelidium* (4) *Sargassum*

95. How many of the following plants have hypogynous condition and vexillary aestivation in corolla in their flowers?

Guava, China rose, Pea, *Calotropis*, Groundnut, Cucumber, Lupin, *Petunia*

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

96. Monocot root differs from dicot root in
(1) Having sclerenchymatous hypodermis
(2) Lacking secondary growth
(3) Having casparian strips in endodermis
(4) Lacking radial vascular bundles

97. Select the **incorrect** statement w.r.t. drupe fruits
(1) They are developed from monocarpellary ovary
(2) Mango and coconut are examples of this type of fruit
(3) These fruits have stony endocarp
(4) In these fruits, mesocarp is always fleshy and edible

98. What proportion of PAR is captured by plants in synthesis of organic matter?
(1) 1-5%
(2) 20%
(3) 2-10%
(4) 1%

99. Active transport differs from facilitated diffusion in
(1) Being saturated in transport process
(2) Being sensitive to protein inhibitors
(3) The requirement of special membrane proteins
(4) Being uphill process

100. Oxygenic photosynthesis is shown by
(1) *Oscillatoria* (2) *Chlorobium*
(3) *Bacillus* (4) *Pseudomonas*

101. Identify the **correct** statement w.r.t *lac* operon.
(1) Regulation of *lac* operon by repressor is referred to as positive control
(2) Operator gene has the site for binding of RNA polymerase
(3) *lac* z gene codes for β-galactosidase
(4) Regulator gene binds with repressor protein molecule, prevents the transcription of structural genes

102. Growth and reproduction are synonymous for
(1) Higher eukaryotes only
(2) Unicellular organisms
(3) All multicellular organisms
(4) Higher plants only

103. All the given features are common between mitochondria and chloroplasts, **except**
(1) Ability of self duplication
(2) Occurrence of circular ds DNA
(3) Ability of synthesising some of their proteins
(4) Site of oxidative phosphorylation

104. How many of the given statements is/are **correct**?
(a) Bryophytes are homosporous plants.
(b) Gymnosperms show events precursor to seed habit.
(c) Heterospory is present in *Selaginella*.
(d) Prothallus is formed in the life cycle of *Dryopteris*.
(1) Two (2) Three
(3) Four (4) One

105. Select the **odd** one w.r.t dedifferentiated tissues.
(1) Intrafascicular cambium
(2) Cork cambium
(3) Interfascicular cambium
(4) Phellogen

106. Megasporophylls in gymnosperms are equivalent to _____ of angiosperms.
(1) Ovule (2) Stamen
(3) Pistil (4) Nucellus

107. Feature which is **correct** about the asexual spores of brown algae is that
(1) These are always non motile structure
(2) They have two flagella of equal length
(3) They have thick cell walls
(4) They are biflagellated and pyriform structures

108. Choose **odd** one w.r.t. tissues formed by secondary growth
(1) Phellem (2) Phelloderm
(3) Collenchyma (4) Wood

109. Excessive growth of algae, plants and animals in water bodies due to nutrient enrichment is called
(1) Biomagnification (2) Eutrophication
(3) Bioprospecting (4) Ecosanitation

110. Select the **odd** one w.r.t functions of golgi apparatus
(1) Formation of glycoproteins and glycolipids
(2) Formation of precursor of enzyme for lysosomes
(3) Formation of acrosome of the sperm
(4) Formation of plasma membrane during cytokinesis

111. A cell in G_1 phase has 20 chromosomes and 10 pg of DNA. What will be the amount of DNA and number of chromatids in that cell in prophase of mitosis?

	Amount of DNA (pg)	**Number of chromatids**
(1)	20	20
(2)	10	20
(3)	20	40
(4)	10	40

112. Find the **incorrect** statement regarding the structure of plasma membrane.
(1) Non-polar tails of phospholipids are composed of saturated hydrocarbons
(2) Membrane of human RBC approximately has 52 percent protein and 40 percent lipids
(3) Polar head of phospholipids are arranged towards outer side of membrane and interacts with water
(4) Peripheral proteins run throughout lipid bilayer and their removal requires crude method of treatment like detergents

113. Which of the following conditions could increase the rate of transpiration?
(1) High relative humidity
(2) Low temperature
(3) High root to shoot ratio
(4) High concentration of salts in soil

114. For which of the following mineral, best defined function is splitting of water to liberate oxygen during photosynthesis?
(1) Mn (2) Mg
(3) Fe (4) Zn

115. Select the **incorrect** statement about chlorophyll 'a'
(1) It shows bright or blue-green colour in chromatogram
(2) It act as reaction centre in both PS I and PS II
(3) It shows absorption maxima only in violet and blue regions of solar radiation
(4) Mg is the constituent of its ring structure

116. If fructose-1,6-bisphosphate is used as a respiratory substrate and been oxidised completely, how many ATP molecules are synthesised directly in this process?
(1) 6 (2) 10
(3) 34 (4) 40

117. Choose **incorrect** match w.r.t. prophase-I of meiosis.
(1) Bivalent formation – Zygotene
(2) Dissolution of synaptonemal complex – Diplotene
(3) Terminalisation of chiasmata – Diakinesis
(4) Tetrad formation – Leptotene

118. Identify the **correct** features for flowers pollinated by wind
a. Light and non sticky pollen grains.
b. Well exposed stamens.
c. Large coloured flowers.
d. Single ovule in each ovary.
e. Formation of nectar.
(1) a, b, and e (2) a, b and d
(3) b, c and e (4) c, d and e

119. Nitrogenase
(1) Requires ATP for reduction of N_2
(2) Contains Fe and Mn
(3) Is present in eukaryotes only
(4) Is oxygen insensitive

120. Which one of the following pea trait is expressed in both homozygous and heterozygous condition?
(1) Green seed (2) Terminal flower
(3) Dwarf stem (4) Green pod colour

121. Pollen viability in rice is about
(1) 4 days (2) 30 minutes
(3) 1 year (4) Several months

122. An immunosuppressive agent used in organ transplant patient is A and is produced by B.

	A	B
(1)	Statin	*Monascus purpureus*
(2)	Lipase	*Candide lipolytica*
(3)	Cyclosporin A	*Trichoderma polysporum*
(4)	Streptokinase	*Streptococcus*

123. In a turgid cell DPD is equal to
(1) TP (2) OP + TP
(3) Zero (4) OP

124. How many plants in the list given below have axile placentation?

Pea, China rose, Tomato, Sunflower, Wheat, Bean, *Argemone*, Marigold, Mustard, Lemon, Maize

(1) Eight (2) Three
(3) Four (4) Six

125. *Avena* curvature test is bioassay of
(1) Gibberellin (2) Auxin
(3) Ethylene (4) ABA

126. Bacterial cells that lack F-plasmid
(1) Are designated as F-cells
(2) Receives genomic DNA during conjugation
(3) Act as recepient of F-plasmid during conjugation
(4) Both (1) & (3)

127. In diploid population, how many genotypes are possible for a gene having three alleles?
(1) 7 (2) 8
(3) 6 (4) 10

128. Seral communities in hydrarch succession are
(i) Phytoplanktons (ii) Shrubs
(iii) Floating plants (iv) Lichens
(v) Marsh-meadows
(1) (ii), (iii), (iv), (v) (2) (ii), (iii), (v) only
(3) (i), (iv) (4) (i), (ii), (v)

129. Select the **incorrectly** matched pair.
(1) Bulbil – *Agave*
(2) Offset – *Eichhornia*
(3) Rhizome – Potato
(4) Sucker – Pineapple

130. A woman whose father was haemophilic, marries a normal man. What will be the probability of their son to be haemophilic?
(1) 50%
(2) 0%
(3) 100%
(4) 25%

131. Identify the **incorrect** statement w.r.t. transcription in eukaryotes
(1) Primary transcript undergoes splicing for the removal of introns
(2) RNA polymerase II catalyses the formation of most abundant RNA of the cell
(3) Synthesis of RNA occurs in the nucleus
(4) Mature mRNA contains multiple adenylate residues at its 3' end

132. A DNA molecule has 4.8×10^6 bp. Calculate the number of nucleosomes associated with this DNA molecule.
(1) 1.2×10^4
(2) 2.4×10^4
(3) 1.2×10^3
(4) 2.4×10^3

133. Meristems are grown *in-vitro* to obtain
(1) Biofortified plants
(2) Plants which are resistant to pests
(3) Virus free plants
(4) High yielding plants

134. Select a population interaction from the following, in which neither of the interacting species get harmed.
(1) Goats and Abingdon tortoise of Galapagos islands
(2) *Cuscuta* growing on hedge plants
(3) Orchid growing on the mango branch
(4) Plants and herbivorous animals

135. Decomposition is higher if the
(1) Detritus has more lignin and cellulose content
(2) Aeration of soil is less
(3) Soil has less moisture content
(4) Temperature of soil is slightly higher than 25°C and contains optimum moisture

ZOOLOGY

136. IVF is followed by the transfer of an embryo with more than 8 blastomeres into
(1) Uterus (2) Fallopian tube
(3) Ovary (4) Vagina

137. Apoenzymes are tightly bound to organic cofactors called
(1) Coenzymes (2) Hormones
(3) Prosthetic group (4) Metal ions

138. Attached earlobes is a recessive character present in 9 individuals in a population size of 100 individuals. Number of heterozygotes in this population is
(1) 49 (2) 42
(3) 18 (4) 21

139. Vitamin A rich variety of rice produced through RDT is called
(1) Atlas-66 (2) Jaya
(3) Golden rice (4) Basmati

140. Choose **correct** statement w.r.t. restriction endonucleases.
(1) Identify single stranded palindromic sequences
(2) Hydrolyse sugar-phosphate backbone of ds DNA
(3) Are produced by eukaryotes only
(4) Always produce cohesive ends within the palindromic sequence

141. Tobacco smoking or use of nicotine increases heart rate and blood pressure by
(1) Stimulating adrenal gland to release aldosterone
(2) Inhibiting sympathetic neural system and directly acting on baroreceptors
(3) Stimulates adrenal gland to release adrenaline into blood circulation
(4) Suppressing limbic system

142. Misuse of anabolic steroids by females, show following side effects, **except**
(1) Breast enlargement (2) Enlarged clitoris
(3) Masculinisation (4) Deepening of voice

143. Which of the following is **not** a vasoconstrictor?
(1) Angiotensin II
(2) ANF
(3) Serotonin
(4) ADH

144. Select the **correct** match of the animal with its mentioned characterstics.

	Animal	Characteristics
(1)	*Locusta*	Respiration through gills and is a gregarious pest
(2)	*Ancylostoma*	Endoparasites with metameric segmentation
(3)	*Asterias*	Water canal system and incomplete digestive system
(4)	*Balanoglossus*	Triploblastic and eucoelomate

145. Choose the **incorrect** match w.r.t. animal and its excretory structure
(1) *Dugesia* – Flame cells
(2) *Cancer* – Antennary glands
(3) *Unio* – Keber's organ
(4) *Ascidia* – Proboscis gland

146. Select the primary lymphoid organ
(1) Spleen (2) Peyer's patches
(3) Lymph nodes (4) Thymus

147. Which of the following have heart but no capillary network?
(1) *Pheretima* (2) *Octopus*
(3) Prawn (4) Hagfish

148. The duration between dubb and lubb heart sound is
(1) 0.7 s (2) 0.5 s
(3) 0.1 s (4) 0.8 s

149. The least number of WBCs in the blood are
(1) Neutrophils
(2) Eosinophils
(3) Basophils
(4) Lymphocytes

150. **Select** a nucleoside from the options given below
(1) Uracil
(2) Uridylic acid
(3) Uracil monophosphate
(4) Uridine

151. Choose the **correct** match w.r.t. location of given epithelial tissues
(1) Fallopian tubes – Ciliated cuboidal
(2) PCT – Simple columnar
(3) Buccal cavity – Pseudostratified epithelium
(4) Ileum – Brush-bordered columnar

152. The end of luteal phase is marked by the decline in concentration of
(1) Oxytocin (2) hPL
(3) Progesterone (4) Prolactin

153. During repolarisation of neural membrane
(1) Potassium voltage gated channels in axonal membrane are open
(2) Neurotransmitters are released into the synapse
(3) Sodium ions move out to the axoplasm
(4) Potassium ions move into the axoplasm

154. Method that offers benefit of protection against STI transmission along with achieving contraception is
(1) LNG 20 (2) Nirodh
(3) Saheli (4) Diaphragm

155. Choose the hormone that binds to a receptor on the cell membrane and stimulates the formation of secondary messenger in the target cell.
(1) Estradiol (2) Cortisol
(3) FSH (4) Progesterone

156. Birds differ from bats in absence of
(1) Non-respiratory skin
(2) Homeothermy
(3) Four chambered heart
(4) Diaphragm

157. *Petromyzon* exhibit following features, **except**
(1) Lack jaw and paired fins
(2) Devoid of scales over body
(3) Suctorial mouth
(4) 4 pairs of gill slits covered with operculum

158. pO_2 in systemic artery and pulmonary vein is respectively
(1) 40 mm Hg, 40 mm Hg
(2) 95 mm Hg, 95 mm Hg
(3) 45 mm Hg, 95 mm Hg
(4) 95 mm Hg, 40 mm Hg

159. **Incorrect** statement regarding cockroach is
(1) Gradual metamorphosis
(2) External fertilization and protostomic
(3) Nymph moults 13 times and lack wings
(4) Ecdysone is a moulting hormone

160. Cloning vector, pBR322 lacks
(1) Cloning site
(2) β-galactosidase encoding gene
(3) 'Ori' site
(4) Selectable markers

161. RNA interference prevents translation by
(1) Ceasing transcription of all genes
(2) Silencing of specific mRNAs
(3) Promoting post-transcriptional modifications
(4) Inhibiting formation of dsRNA

162. Sexual stages called gametocytes of *Plasmodium* appears in
(1) Hepatocytes of human
(2) Salivary glands of mosquito
(3) Human red blood cells
(4) Hepatocytes and WBCs of human blood

163. Enzymes show following attributes except
(1) They are carbohydrates in nature
(2) They speed up the rate of biochemical reactions
(3) They are specific in nature
(4) They have active sites.

164. Identify the hormone with its **correct** match of source and mechanism of action.

	Hormone	Source	Mode of Action
(1)	Progesterone	Ovary	Activates secondary messenger in cells of endometrium
(2)	Oxytocin	Pars distalis	Activates secondary messenger in myometrium
(3)	Cortisol	Zona fasciculata	Alters gene expression in target cells
(4)	Secretin	Small intestine	Alters gene expression in target cells

165. Mark the **correct** statement
(1) Urine is highly alkaline in nature
(2) Vitamins are inorganic metals
(3) Cardiac musculature is autoexcitable
(4) Pneumotaxic center is present in medulla of brain

166. Out of the following digestive juices, arrange them in order of decreasing pH and select the **correct** option.
(A) Pancreatic juice
(B) Saliva
(C) Gastric juice
(1) (A), (B) & (C) (2) (C), (A) & (B)
(3) (B), (A) & (C) (4) (C), (B) & (A)

167. Identify the **incorrect** statement from the following
(1) MOET is employed for herd improvement.
(2) *Catla* and *Rohu* are marine fishes
(3) Mule is a result of Interspecific hybridisation.
(4) Leghorn is an improved breed of chicken.

168. If there is no pregnancy, the corpus luteum begins to degenerate about 3-4 days before the next menses and is eventually replaced by scar tissue, forming a
(1) Corpus haemorrhagicum
(2) Corpus albicans
(3) Corpus striatum
(4) Corpus allatum

169. Select the **incorrect** match w.r.t. disorders.
(1) Arthritis – Inflammation of joints
(2) Glomerulonephritis – Inflammation of urinary bladder
(3) Myasthenia gravis – Autoimmune disorder
(4) Uremia – Accumulation of urea in blood

170. What is **true** regarding menstrual cycle?
(1) Follicular phase is followed by menstrual phase.
(2) Lack of menstruation may be an indicative of pregnancy.
(3) Menstrual cycle is absent in monkeys.
(4) Progesterone surge induces ovulation.

171. Select **odd** one w.r.t. parthenogenesis
(1) Honey bee (2) Cockroach
(3) *Aphid* (4) Turkey

172. A female who is on mini-pills stops taking them. Which of the following will be the immediate effect?
(1) Sperm motility is supressed
(2) Fertility is lost
(3) Menstrual bleeding occurs
(4) Menstruation stops

173. The state of heart when it is not pumping blood effectively enough to meet the needs of the body is termed as
(1) Angina Pectoris
(2) Myocardial infarction
(3) Heart block
(4) Heart failure

174. Molecular diagnostic technique based on antigen antibody interaction is
(1) PCR
(2) Gel electrophoresis
(3) ELISA
(4) Autoradiography

175. In human body, number of carpals in one limb is equivalent to number of
(1) Cranial bones (2) Facial bones
(3) Intervertebral discs (4) Cervical vertebrae

176. Frog, cockroach, *Pavo*, *Macropus*, earthworm share which of the following common features?
(1) Direct development and true coelom
(2) Protostomic and internal fertilization
(3) Closed circulatory system and external fertilization
(4) Bilateral symmetry and metamerism

177. Thin and thick myofilaments are not overlapped in the middle of sarcomere called X that bisects Y
Choose the **correct** option that fill up the blanks.

	X	**Y**
(1)	M-line	I-band
(2)	Z-line	A-band
(3)	H-zone	A-band
(4)	H-zone	I-band

178. Different characters observed in spotted cuscus, bobcat, wombat and koala are the examples of
(1) Divergent evolution (2) Convergent evolution
(3) Co-evolution (4) Artificial selection

179. Insertion of an alien DNA at which region in pUC8, produces white coloured colonies on medium containing X-gal and ampicillin.
(1) "Ori site"
(2) Ampicillin resistance gene
(3) Tetracycline resistance gene
(4) *lac z* gene

180. Select the **odd** one w.r.t direct method of gene transfer.
(1) Disarmed Retroviruses
(2) Chemical mediated
(3) Biolistic
(4) Microinjection

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