TECHNO INDIA GROUP OF PUBLIC SCHOOLS

Dt. 10-11-2025

NEET (XII)

Monthly Mock Test - 5 (November-2025)

Time Allowed: **3 hours** Maximum Marks: **720**

General Instructions:

1. This test will be a 3 hours Test, Maximum Marks 720.
2. This test consists of 180 questions of Physics, Chemistry and Biology. All questions are COMPULSORY to attempt. MCQ (one correct answer).
3. Each question is of 4 marks.
4. There are three parts in the question paper, consisting Part-I Physics (Q. No. 1 to 45), Part-II Chemistry (Q. no. 46 to 90), Part-III Biology (Q. no. 91 to 180).
5. There will be only one correct choice in the given four choices for each question. For each question 4 marks will be awarded for correct choice, 1 mark will be deducted for incorrect choice and zero mark will be awarded for unattempted question.
6. Any textual, printed or written material, mobile phones, calculator, etc. is not allowed for the students appearing for the test.
7. All calculations / written work should be done in the rough sheet provided.

Space For Rough Works

PHYSICS

Assertion and Reason Based Question :

Directions: Read the following questions and choose any one of the following four responses.

A: Assertion and Reason both are correct and Reason is the correct explanation of Assertion.

B: Assertion and Reason both are correct and Reason is not the correct explanation of Assertion.

C: Assertion is correct but Reason is wrong.

D: Assertion is wrong but Reason is correct.

1. **Assertion (A) :** Current will flow between the two points in a circuit only when their is a potential difference act between the points.

Reason (R) : Current may flow between the points in a circuit even their is no potential difference act between the points.

① A ② B ③ C ④ D

2. If 5% of the energy supplied to a bulb is irradiated as visible light, how many quanta are emitted per sec. by a 100 w lamp? Assume wavelength of light is 5.6×10^{-5} cm.

① 1.4×10^{19} ② 1.4×10^{-19} ③ 2×10^{-14} ④ 2×10^{14}

3. In an ideal transformer the number of turns of primary and secondary coil is given by 100 and 300 respectively. If the power input is 100 w, the power output is

① 100 w ② 300 w ③ 180 w ④ 10 w

4. If the power factor changes from $\frac{1}{2}$ to $\frac{1}{4}$ then what is the increase in impedance in AC ?

① 20% ② 50% ③ 25% ④ 100%

5. A horizontal overhead power line is at at a height 4m from the ground and carries a current 100 A from East to West. The magnetic field directly below it on the ground is

① 5×10^{-6} T southward ② 2.5×10^{-7} northward

③ 2.5×10^{-7} southward ④ 5×10^{-7} northward

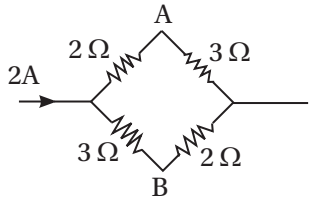
6. Refractive index of glass is 1.5. The speed of light in glass is

① 3×108 m/s ② 2×108 m/s ③ 1×108 m/s ④ 4×108 m/s

7. A charged particle enters in a region of constant, uniform and mutually orthogonal fields E and B with a velocity v perpendicular to both E and B, and comes out with same velocity. Then

① $\vec{v} = \frac{\vec{B} \times \vec{E}}{E^2}$ ② $\vec{v} = \frac{\vec{E} \times \vec{B}}{B^2}$ ③ $\vec{v} = \frac{\vec{B} \times \vec{E}}{B^2}$ ④ $\vec{v} = \frac{\vec{E} \times \vec{B}}{E^2}$

8. The potential difference between A and B as shown in figure is

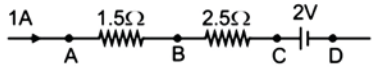


① 1V ② 2V ③ 3V ④ 4V

9. An electron is moving with an initial velocity $\vec{V} = V_0 \hat{i}$ and is in a magnetic field $\vec{B} = B_0 \hat{j}$. Then, its de- Broglie wavelength

① remains constant ② increases with time
③ decreases with time ④ first increases then decreases

10. In the given circuit, if the potential at point B, $V_B = 0$, then the potentials at A and D are given as



① $V_A = -1.5$ V, $V_D = +2$ V ② $V_A = -1.5$ V, $V_D = +0.5$ V
③ $V_A = +1.5$ V, $V_D = +0.5$ V ④ $V_A = +1.5$ V, $V_D = -4.5$ V

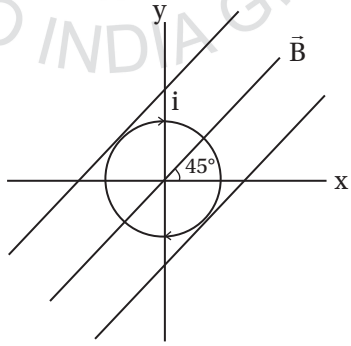
11. In the middle of the depletion layer of a reverse-biased p-n junction, the

① Potential is zero ② electric field is zero
③ potential is maximum ④ electric field is maximum

12. When an electron de-excites from level n to level (n – 1) in a hydrogen atom, frequency of emitted radiation is

① n time of frequency of revolution of electron in the orbit
② (n – 1) times of frequency of revolution of electron in orbit
③ same as that of frequency of revolution of electron in the orbit only for large values of n
④ same as that of frequency of revolution of electron in the orbit only for small values of n

13. A circular loop of radius R = 20 cm is placed in x – y plane where a uniform magnetic field $\vec{B} = (2T)\left(\frac{\hat{i}+\hat{j}}{\sqrt{\ }}\right)$ exists. The loop carries a current i = 1A in the direction shown in figure. Find the magnitude of torque acting on the loop.



① 0.25 M W ② 1 M W ③ 1.5 M W ④ 2 M W

14. A prism of refractive index $\frac{3}{2}$ is placed in water of refractive index $\frac{4}{3}$. If the angle of prism is 4, calculate the angle of minimum deviation in water.

① 0.5° ② 1° ③ 1.5° ④ 2°

15. The magnetic flux ϕ_B through a metal ring varies with time t according to $\phi_B = 3(at^3 - bt^2)$ with a = 2 $Tm^2 s^{-3}$ and b = 6 $Tm^2 s^{-2}$. The resistance of the ring is 3 Ω. Determine the maximum current induced in the ring during the interval from t = 0 to t = 2 s.

① 10A ② 6A ③ 5A ④ 11A

16. In a single slit diffraction experiment first minimum for λ_1 = 660 nm coincides with first maxima for wavelength λ_2. Calculate λ_2.

① 440 nm ② 220 nm ③ 110 nm ④ 550 nm

17. The resistance of a conductor depends upon

① size of conductor
② temperature of conductor
③ geometrical shape of conductor
④ geometrical shape of conductor

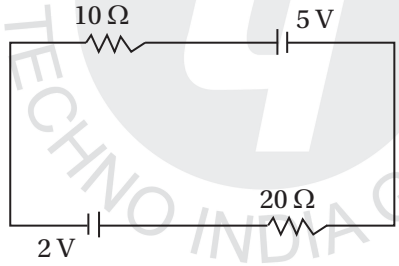
18. An inductor 200 mH, a capacitor 500 μF and a resistor 10 Ω are connected in series with an a.c. source of variable frequency. What is the frequency at which the power factor of the circuit is unity ?

① 10.22 Hz ② 12.4 Hz ③ 19.2 hz ④ 15.92 Hz

19. Imagine a closed surface surrounding an isolated point charge. Now a second charge is brought to a point just outside the surface. The electric flux across the closed surface

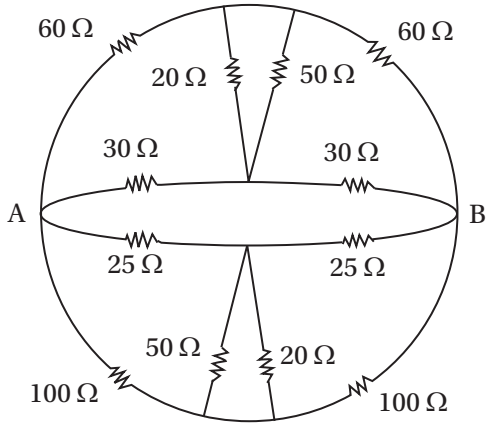
① will change but the shape of the lines remains the same.
② will remain the same but the shape of the lines change.
③ as well as the shape of the lines remains the same.
④ as well as the shape of the lines will change.

20. The current in the given circuit is



① 0.1 A ② 0.2 A ③ 0.3 A ④ 0.4 A

21. The equivalent resistance between points A and B in the figure is

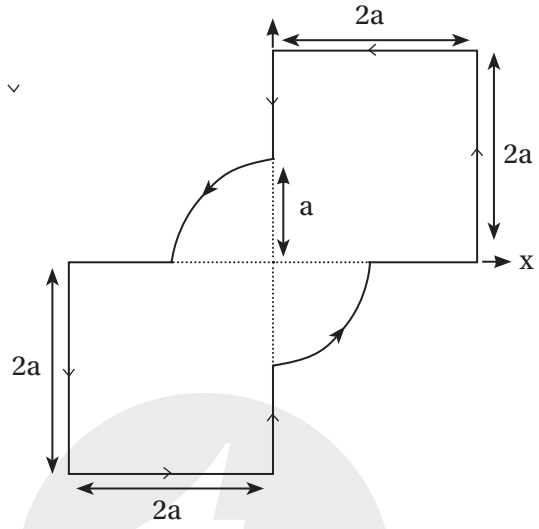


① 80 Ω ② 20 Ω ③ 40 Ω ④ 60 Ω

22. Radius of a current carrying coil is 'R'. The ratio of the magnetic field at the centre of the coil to the magnetic field at an axial point which is R distance away from the centre of the coil, is

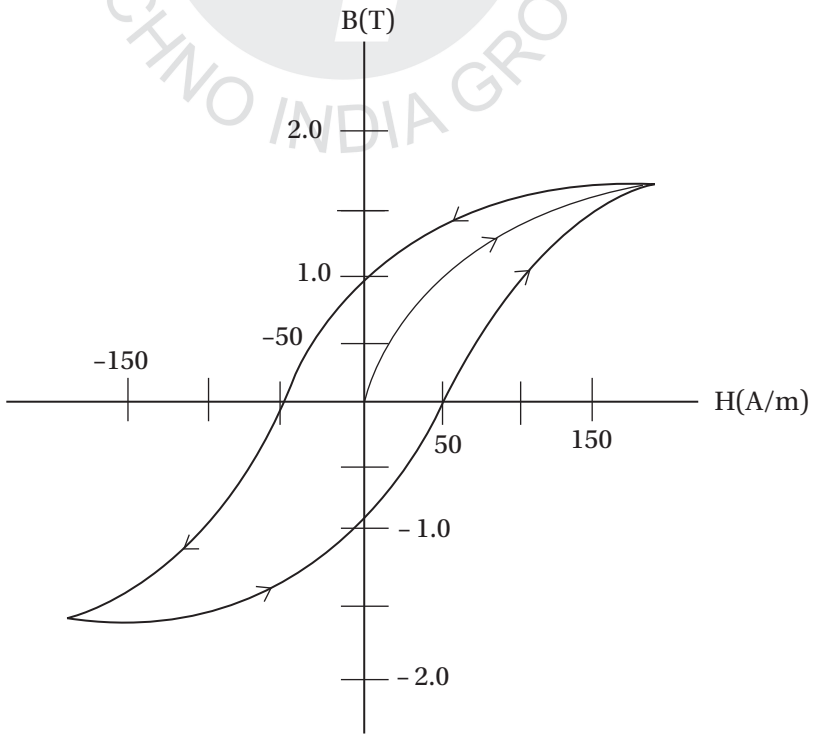
① 2 ② $\sqrt{2}$ ③ $2\sqrt{2}$ ④ 4

23. A current I flows through the circuit of a thin wire as shown in the figure. If there exists a uniform external magnetic field B parallel to the plane of the circuit, the torque acting on the circuit is



① $1\left(\frac{\pi a^2}{2}+8a^2\right)B$ ② $1\left(\frac{\pi a^2}{2}+4a^2\right)B$ ③ $1\,(\pi a^2+8a^2)\,B$ ④ zero

24. The figure gives B ~ H curve for a ferromagnetic material. The retentivity, coercivity and magnetic saturation, respectively, of the material are:



① 50 A/m, 1T, 1.5T ② 1.5 T, 50 A/m, 1T ③ 1 T, 50 A/m, 1.5 T ④ 50 A/m, 1.5 T, 1 T

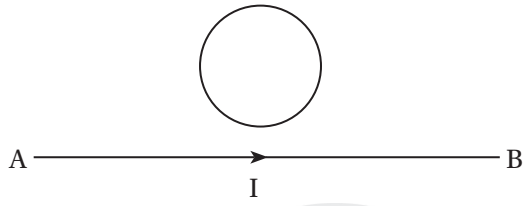
25. The coercivity of a small magnet where the ferromagnet gets demagnetized is 3×10^3 A/m. The minimum current required to be passed in a solenoid of length 10 cm and number of turns 100, so that the magnet gets demagnetized when placed inside the solenoid, is –

① 3A ② 6A ③ 30 mA ④ 60 mA

26. The equivalent inductance of two inductances is 2.4 henry when connected in parallel and 10 henry when connected in series. The difference between the two inductances is

① 2 henry ② 3 henry ③ 4 henry ④ henry

27. The time dependent current at time t is I = 2t flowing from A to B as shown in the figure. The induced current in the loop is :-



① increasing and clockwise ② increasing and anti-clockwise

③ constant and anti-clockwise ④ constant and clockwise

28. A circuit contains R, L and C connected in series with an A. C. source. The values of the reactances for inductor and capacitor are 200 Ω and 600 Ω respectively. If the values of the reactances are interchanged

① The current in the circuit lags behind voltage ② The impedance will increase

③ The impedance will decrease ④ The power factor changes

29. A coil has an inductance of 1 henry and is joined in series with a resistance of 220Ω. When the alternating emf of 220 V – 35 Hz is applied to it then the wattles component of the current in the circuit will be

① 1A ② 0.5A ③ 1.5A ④ 2A

30. Electromagnetic wave consists of electric and magnetic fields periodically oscillating

① in mutually perpendicular planes but vibrating with a phase difference of π .
② in mutually perpendicular planes but vibrating with a phase difference of $\pi/2$.
③ in randomly oriented planes but vibrating in phase.
④ in mutually perpendicular planes but vibrating in phase.

31. A plane electromagnetic wave travels in free space along X-direction. If at a particular point in space and time $\vec{B} = (1.2\times10^{-8}\,T)\hat{k}$ then the $\vec{E}$ will be

① $(3.6V)\hat{j}$ ② $(-3.6V/m)\hat{j}$ ③ $(3.6V/m)\hat{j}$ ④ $(3.6V)\hat{k}$

32. A thin prism of angle 3° made of glass of refractive index μ1 = 1.5 is combined with another prism of glass of refractive index μ2 = 1.6. The combination of the prisms produces dispersion without deviation. The angle of the second prism should be :-

① 3.2° ② 2.8° ③ 2.5° ④ 3.6°

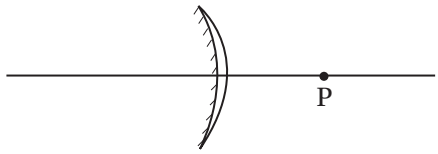
33. A ray of light is incident on a 60° prism at the minimum deviation position. The angle of incidence at the second face of the prism is:-

① 30° ② 45° ③ 60° ④ Zero

34. If an interference pattern have maximum and minimum intensities in 36 :1 ratio then the ratio of amplitudes of incident beams on two slits will be

① 36 : 1 ② 6 : 1 ③ 4 : 7 ④ 7 : 5

35. Radii of curvature of two surfaces of a concavo-convex lens are 20 cm and 10 cm. A point object P is placed at a distance 30 cm from the lens. The back surface of the lens is silvered. If the refractive index of lens is 1.5 then the image is



① real and magnification is – 0.4 ② real and magnification is 0.4

③ virtual and magnification is – 0.4 ④ virtual and magnification is 0.4

36. The photoelectric work function for a metal surface is 4.125 eV. The cut-off wavelength for this surface is

① 4125 Å ② 2062.5 Å ③ 3000 Å ④ 6000 Å

37. If the kinetic energy of a free electron doubles, its de-Broglie wavelength changes by the factor

① 1/2 ② 2 ③ $1/\sqrt{2}$ ④ $\sqrt{2}$

38. Determine the ratio of perimeters in 2nd and 3rd Bohr orbits in He^{+} ion

① 1 : 2 ② 2 : 3 ③ 1 : 4 ④ 4 : 9

39. If the radius of the nucleus of $^{27}_{13}Al$ atom is 3r then the radius of the nucleus of $^{125}_{53}I$ will be

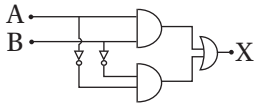
① 3r ② 4r ③ 5r ④ 6r

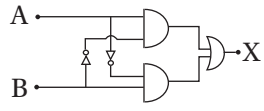
40. A nucleus with mass number 220 initially at rest emits an α-particle. If the Q value of the reaction is 5.5 MeV, calculate the kinetic energy of the α- particle.

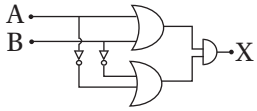
① 4.4 MeV ② 5.4 MeV ③ 5.6 MeV ④ 6.5 MeV

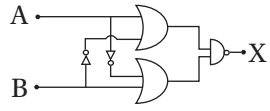
41. The truth table, given below, belongs to

A	B	X
0	0	1
0	1	0
1	0	0
1	1	1

① 

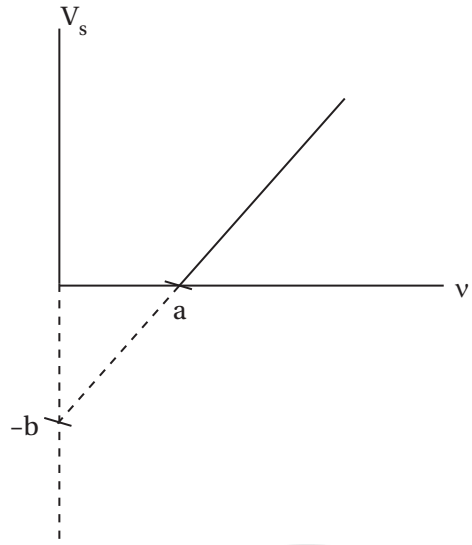
② 

③ 

④ 

42. In photoelectric effect variation of stopping potential (Vs) with frequency (ν)of photon incident on a matel

is shown in the graph given below. Which of the followings is true?



① The gradient of the graph is h/e
② The threshold frequency of the metal is a
③ The work function of the metal is be
④ The work function of the metal is be

43. When a cell of emf 15 V is connected to the parallel combination of RΩ and 2 Ω resistances, power dissipated in the circuit is 150 W. The power dissipated (in watt) in RΩ is

① 50 ② 75 ③ 100 ④ 37.5

44. An electron in H-atom makes transition from $n_1 \rightarrow n_2$. The time period of electron in initial state is eight times to that in final state. Then the ratio of $n_1 : n_2$ is

① 8 : 1 ② 4 : 1 ③ 2 : 1 ④ 64 : 1

45. A monochromatic light of wavelength 600 nm in air enters in glass of refractive index 1.5. In glass on the path of a ray two points are at a distance 600 nm. The phase difference between the two points is

① 0 ② π ③ π/2 ④ 2 π/3

CHEMISTRY

46. The density of 2(M) aqueous solution of NaOH is 1.28 g/cc. The molality of solution is:

① 1.32 m ② 1.20 m ③ 1.56 m ④ 1.67 m

47. The mixture which shows positive deviation from Raoult's law is:

① Benzene + Toluene
② Acetone + Chloroform
③ Chloroethane + Bromoethane
④ Ethanol + Acetone

48. The standard oxidation potentials, E° for the half reaction are as:

$Zn = Zn^{2+} + 2e^{\ominus}$; $E^o = +0.76$ V $Fe = Fe^{2+} + 2e^{\ominus}$; $E^o = 0.41$ V

The E^o_{cell} is: $Fe^{2+} + Zn \rightleftharpoons Zn^{2+} + Fe$

① –0.35 V ② +0.35 V ③ +1.17 V ④ –1.17 V

49. The gas evolved when methyl amine reacts with nitrous acid is:

① Ammonia ② Nitrogen ③ Hydrogen ④ Ethane

50. The correct I.U.P.A.C name for $CH_2 = CHCH_2NHCH_3$ is:

① Allymethylamine ② 2–amino–4–pentane

③ 4–aminopent–1–ene ④ N–methylprop–2–en–1 amine

51. Which of the following gives carbyl amine test?

① $(C_2H_5)_2NH$ ② $C_2H_5NH_2$ ③ $(C_2H_5)_3N$ ④ $CH_3NHC_2H_5$

52. The source of Nitrogen in Gabriel synthesis of amines is:

① Sodium azide, NaN_3 ② $NaNO_2$

③ KCN ④ Potassium phthalimide, $C_6H_4(CO)_2N^{\ominus}K^{-1}$

53. Which of the following is most basic?

① p–toluidine ② aniline ③ O–toluidine ④ m–toluidine

54. What derivative's yield is maximum in the given reaction?

$$\text{Anilime}\,(C_6H_5NH_2) \xrightarrow[273-288\,K]{HNO_3, H_2SO_4}$$

① ortho ② para ③ meta ④ None of these

55. In Gabriel synthesis amines cannot be prepared

① CH_3NH_2 ② $CH_3CH_2NH_2$

③ RNH_2 ④ $C_6H_5NH_2$

Assertion–Reason Questions (Q.11–Q.15):

(A) Both (A) and (R) are correct and (R) is the correct explanation of (A)

(B) Both (A) and (R) are correct but (R) is not the correct explanation of (A)

(C) (A) is correct but (R) is not correct

(D) (A) is not correct but (R) is correct

56. **Assertion:** Aromatic amines can be nitrated directly.

Reason: Nitric acid being a strong oxidising agent result in complete oxidation of the ring.

① A ② B ③ C ④ D

57. **Assertion:** Carbyl amine reaction involves chemical reaction between primary amines and chloroform in basic medium.

Reason: Carbyl amine reaction – NH_2 group convert into – NC group.

① A ② B ③ C ④ D

58. **Assertion:** Aniline is stronger base than ammonia.

Reason: Aniline is resonance stabilised.

① A ② B ③ C ④ D

59. **Assertion:** Friedel–Craft is an electrophilic substitution reaction.

Reason: Aniline undergo Friedel–Crafts reaction.

① A ② B ③ C ④ D

60. **Assertion:** Cu^{2+} ions get reduced more easily than H^+ ions.

Reason: Standard electrode potential of copper is 0.34 V.

① A ② B ③ C ④ D

61. The molar ionic conductivities of NH_4^+ and $OH^\ominus$ at infinite dilution are 72 & 198 $ohm^{-1}cm^2$ respectively. The molar conductivity of a centi-normal NH_4OH solution at the same temperature is formed to be 9 $ohm^{-1}cm^2$. The percentage dissociation of NH_4OH at this concentration will be:

① 3.33% ② 7.14% ③ 12.5% ④ 4.5%

62. Molar conductivity of 0.15 M solution of KCl at 298K, if its conductivity is 0.01525 cm^{-1} will be:

① 124 Ω^{-1} cm^2 $(mole)^{-1}$ ② 204 Ω^{-1} cm^2 $(mole)^{-1}$ ③ 101 Ω^{-1} cm^2 $(mole)^{-1}$ ④ 300 Ω^{-1} cm^2 $(mole)^{-1}$

63. What is cell constant of a cell of KCl containing $\frac{N}{50}$ solution, if the conductivity and resistance of cell is 0.002765 S cm^{-1} and 400 ohm respectively?

① 6.91 cm^{-1} ② 1.106 cm^{-1} ③ 14.46 cm^{-1} ④ 2.212 cm^{-1}

64. If $E^o_{Fe^{2+}/Fe}$ is x_1, $E^o_{Fe^{3+}/Fe}$ is x_2, than $E^o_{Fe^{3+}/Fe^{2+}}$ will be:

① $3x_2 - 2x_1$ ② $x_2 - x_1$ ③ $x_2 + x_1$ ④ $2x_1 + 3x_2$

65. The specific conductances of four electrolytes in $ohm^{-1}cm^{-1}$ are given in option below. Which one offers highest resistance to the passage of electric current?

① 7×10^{-3} ② 9.2×10^{-9} ③ 6×10^{-7} ④ 4×10^{-8}

66. $Zn/Zn^{2+}(C_1) \,||\, Zn^{2+}(C_2) \,|\, Zn$ for this cell ΔG is negative of:

① $C_1 = C_2$ ② $C_1 > C_2$ ③ $C_2 > C_1$ ④ None of these

67. The nature of curve of E^o_{cell} vs log K_e is:

① straight line ② parabola ③ hyperbola ④ elliptical curve

68. Which of the following reagents may be used to accomplish the conversion?

$C_6H_5CH=CH-CH_2OH \longrightarrow C_6H_5CH=CHCHO$

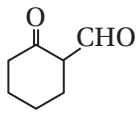
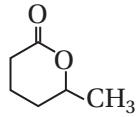
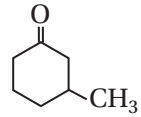
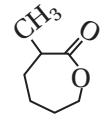
① $[(CH_3)_3CO]_3Al$, >– OH ② 

③ MnO_2 ④ All of these

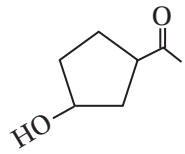
69. The most appropriate reagent for the conversion of 2–pentananone into butanoic acid is:

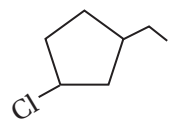
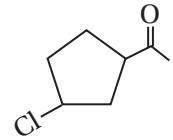
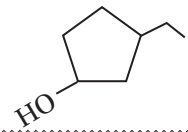
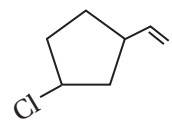
① chromic acid hypochloride ② acidified $KMnO_4$ ③ alkaline $KMnO_4$ ④ sodium

70. 2–methylcyclohexanone is allowed to react with metachloroperoxobenzoic acid (m–CPBA). The major product formal in the reaction is:

①  ②  ③  ④ 

71. In the given reaction product (P) is:



①  ②  ③  ④ 

72. In the cannizaro reaction, which is the slowest step?

$2PhCHO \xrightarrow{OH^{\ominus}} PhCH_2OH + PhCOO^{\ominus}$

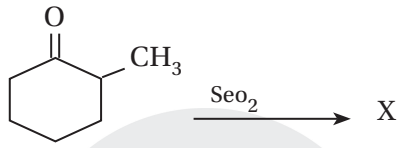
① The attack of $OH^{\ominus}$ at the carboxyl groups
② The transfer of hydride to the carboxylic group
③ The abstraction of proton from the carboxylic acid
④ The deprotonation of $PhCH_2OH$

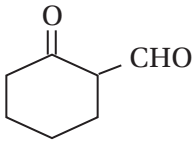
73. In the given reaction, [X] will be :

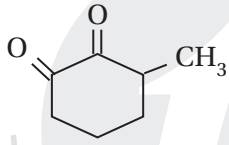
$C_6H_5-\underset{\underset{O}{\|}}{C}-H \xrightarrow{NH_2OH/H^+} X$

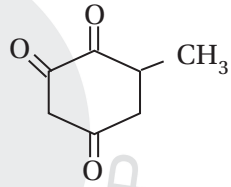
① only syn mixture
② only antis mixture
③ mixture of syn and anti oxime
④ secondary amide

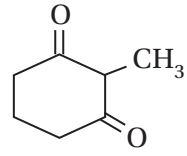
74. in the given reaction (X) will be :



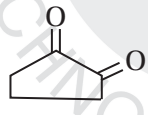
① 

② 

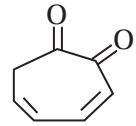
③ 

④ 

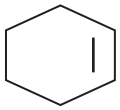
75. which of the following compounds have higher enolic content than keto content ?

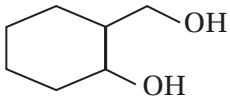
① $CH_3-\overset{O}{\overset{\|}{C}}-\overset{O}{\overset{\|}{C}}-CH_3$ ② 

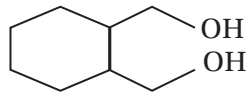
③ 

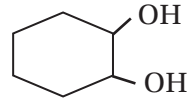
④ 

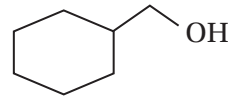
76. In the given reaction :


$\xrightarrow[1.\ H_2O]{1.\ HCHO/H^+}$ 'X' ; 'X' IS :

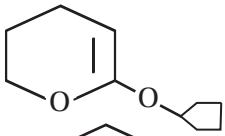
① 

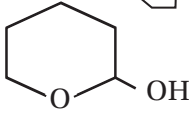
② 

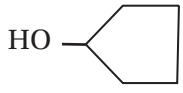
③ 

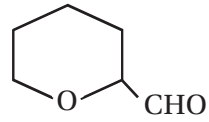
④ 

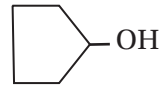
77. In the given reaction :

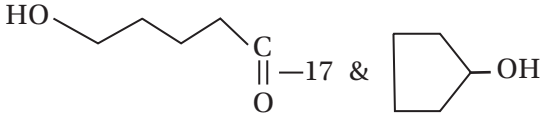

$\xrightarrow{H_2O/H^+}$ 'P' + 'Q' ; Identify 'P' & 'Q'

① 

and 

② 

& 

③ 

④ All of these

78. Which of the following gives blood red colour with KCNS ?

① Cu^{2+} ② Fe^{3+} ③ Al^{3+} ④ Zn^{2+}

79. How many moles of acidified $FeSO_4$ solution can be completely oxidised by one mole of $KMnO_4$?

① 10 ② 5 ③ 6 ④ 2

80. The colour of $KMnO_4$ is due to

① $L \rightarrow M$ charge transfer transition. ② $\sigma \rightarrow {}^*\sigma$ transition

③ $M \rightarrow L$ charge transfer transition ④ d – d transition.

81. The purple colour of $[Ti(H_2O)_6]^{3+}$ in

① presence of an unpaired d-electron ② transfer of an electron from metal to ligand

③ transfer of an electron from metal is ligand ④ presence of all paired electron

82. Vanadyl ion is :

① VO^{2+} ② VO_2^{+} ③ V_2O^{+} ④ VO_4^{3+}

83. Colour in transion metal compounds is attributed to :

① small size of metal ions ② absorption of light in UV region

③ moderate ionisation energy ④ incomplete (n – 1) d subsheets

84. Which of the following processes does not involve oxidation of iron?

① formation of $Fe(CO)_5$ from Fe

② liberation of H_2 from steam by iron at high temperature

③ Rusting of iron sheets

④ Decolourization of blue $CuSO_4$ solution by iron.

85. Match the catalysts to the corr process :

Catalyst	**Process**
(a) $TiCl_4$	(i) Walker process
(b) $PdCl_2$	(ii) Ziegler – Natta poymerization
(c) $CuCl_2$	(iii) Contact process
(d) V_2O_5	(iv) Deacon's process

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

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

86. Arrange Ce^{3+}, La^{3+}, Pm^{+3} and Yb^{3+} in increasing order of their ionic radii.

① $Yb^{3+} < Pm^{3+} < Ce^{+3} < La^{3+}$ ② $Ce^{3+} < Yb^{3+} < Pm^{+3} < La^{3+}$

③ $Yb^{3+} < Pm^{3+} < La^{3+} < Ce^{3+}$ ④ $Pb^{3+} < La^{3+} < Ce^{3+} < Yb^{3+}$

87. Which of the statements is not true ?

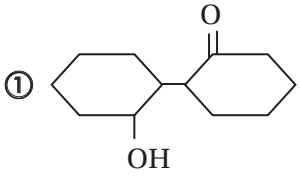
① On paring H_2S through acidified $K_2Cr_2O_7$ solution, a milky colour is observed

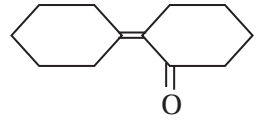
② $Na_2Cr_2O_7$ is preferred over $K_2Cr_2O_7$ in volumetric analysis

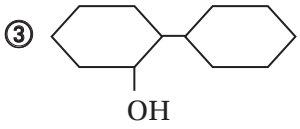
③ $K_2Cr_2O_7$ solution in acidic medium orange

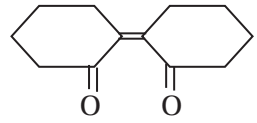
④ $K_2Cr_2O_7$ solution becomes yellow on increasing pH beyond 7.

88. Of the followingwhich is the product formed when cyclohexanone undergoes aldol condensation followed by heating ?

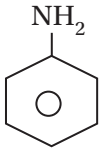
① 

② 

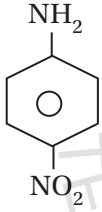
③ 

④ 

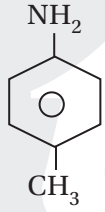
89. The correct increasing order of basic strength for the following compounds is :



(I)



(II)



(III)

① II < III < I ② III < I < II ③ III < II < I ④ II < I < III

90. Which of the following compounds can form a zwitter ion ?

① Benzoic acid ② Acetanilide ③ Aniline ④ Glycine

Biology

91. Which of the following cell organelles is involved in photorespiration?

① Peroxisome ② Golgi body ③ Ribosome ④ Lysosome

92. Identify the incorrect statement about enzymes.

① Enzymes lower activation energy.

② Enzyme activity decreases with temperature beyond optimum.

③ Enzymes are carbohydrates in nature.

④ Enzymes act as biological catalysts.

93. **Assertion (A):** The mitotic metaphase chromosome has two chromatids.

Reason (R): DNA replication occurs during the G_1 phase.

① Both A and R true and R is the correct explanation of A

② Both A and R true but R is not the correct explanation of A
③ A true and R false
④ A is false but R is true

94. The longest phase of meiosis is:
① Prophase I ② Metaphase I ③ Anaphase I ④ Telophase II

95. The primary CO_2 acceptor in C_4 plants is:
① PEP ② RuBP ③ PGA ④ OAA

96. The number of ATP molecules formed from one molecule of glucose in aerobic respiration is:
① 2 ② 8 ③ 36 ④ 38

97. **Match the following:**

a. Glycolysis—(i) Cytoplasm
b. Krebs cycle—(ii) Mitochondria
c. Calvin cycle—(iii) Stroma

① a–i, b–ii, c–iii ② a–ii, b–i, c–iii ③ a–iii, b–ii, c–i ④ a–i, b–iii, c–ii

98. The Casparian strip is found in:
① Cortex ② Endodermis ③ Pericycle ④ Pith

99. Which one of the following is a false fruit?
① Mango ② Banana ③ Apple ④ Tomato

100. A cell in G_0 phase is:
① Preparing for division ② Differentiated and quiescent
③ Undergoing meiosis ④ None of these

101. Which one of the following is NOT a characteristic of monocots?
① Parallel venation ② Fibrous roots
③ Tetramerous flowers ④ Scattered vascular bundles

102. The function of leg-haemoglobin in root nodules is to:
① Transport nitrogen ② Protect nitrogenase from oxygen
③ Transport oxygen for respiration ④ Activate nitrogenase enzyme

103. In an ecosystem, energy flow is always:
① Unidirectional ② Bidirectional ③ Cyclic ④ Random

104. The functional unit of kidney is the _____.
① Glomerulus ② Nephron ③ Tubule ④ Henle's loop

105. Which hormone promotes cell elongation?
① Cytokinin ② Ethylene ③ Auxin ④ ABA

106. A child is unable to produce enough thyroxine. He shows stunted growth and mental retardation. Which disorder does he suffer from?
① Cretinism ② Goitre ③ Gigantism ④ Myxedema

107. The small pores present on the leaf surface for gaseous exchange are called:
① Stomata ② Lenticels ③ Hydathodes ④ Trichomes

108. The genetic material of a retrovirus is:
① ssRNA ② dsDNA ③ ssDNA ④ dsRNA

109. In a food chain, 10% energy is transferred from one trophic level to the next. This is called:
① Energy rule of Lindeman ② Law of limiting factors
③ Law of tolerance ④ Rule of ten

110. Which tissue is responsible for secondary growth in plants?
① Apical meristem ② Intercalary meristem ③ Cambium ④ Collenchyma

111. **Assertion (A):** In prokaryotes, transcription and translation occur simultaneously.
Reason (R): There is no nuclear membrane.
① Both A and R true and R is the correct explanation of A
② Both A and R true but R is not the correct explanation of A
③ A true and R false
④ A is false but R is true

112. DNA replication occurs in which phase of the cell cycle?
① G_1 ② S ③ G_2 ④ M

113. Which structure of the human brain controls respiration and heartbeat?
① Medulla oblongata ② Cerebellum
③ Cerebrum ④ Hypothalamus

114. Which among the following is a vestigial organ in humans?
① Appendix ② Liver ③ Heart ④ Kidney

115. The joint between atlas and axis allows:
① Nodding ② Rotation of head ③ Flexion ④ Extension

116. Plants with ovaries having only one or a few ovules, are generally pollinated by
① Bees ② Butterflies ③ Birds ④ Wind

117. **Study the given flowchart:**
DNA → mRNA → Protein
The process from DNA → mRNA is called _____.
① Translation ② Transcription
③ Transformation ④ Transduction

118. The plant pigment responsible for photoperiodic induction is:
① Phytochrome ② Chlorophyll ③ Anthocyanin ④ Xanthophyll

119. A disease caused by autosomal primary non disjunction is:
① Down's syndrome ② Klinefelter's syndrome
③ Turner's syndrome ④ Sickle cell anaemia

120. Motile zygote of *Plasmodium* occurs in:

① Human RBCs ② Human liver
③ Gut of female *Anopheles* ④ Salivary gland of *Anopheles*

121. The end product of glycolysis is:

① Glucose ② Pyruvate ③ CO_2 ④ Acetyl-CoA

122. Which of the following is NOT a function of the liver?

① Urea formation ② Glycogen storage
③ Production of insulin ④ Detoxification

123. In human female, meiosis II in ovum is completed:

① Before ovulation ② After fertilization ③ Before fertilization ④ During puberty

124. The pathogen, *Microsporum*, responsible for ringworm in humans, belong to the same kingdom of organisms as that of:

① *Rhizopus*, a mould ② *Wuchereria*, a filarial worm
③ *Taenia*, a tapeworm ④ *Ascaris*, a roundworm

125. The first stable product in C_3 cycle is:

① OAA ② 3-PGA ③ Malate ④ PEP

126. Which of the following statements is correct about genetic code?

① It is overlapping ② It is degenerate
③ It is ambiguous ④ It is specific for all species

127. **Case Study:**

A patient is breathing rapidly, showing elevated body temperature, and is tested positive for COVID-19.

Which system of the body is most affected?

① Respiratory ② Nervous ③ Digestive ④ Excretory

128. Which hormone regulates blood calcium level?

① Thyroxine ② Calcitonin ③ Insulin ④ Aldosterone

129. The site of fertilization in humans is:

① Vagina ② Uterus ③ Fallopian tube ④ Ovary

130. A good producer of citric acid is:

① *Pseudomonas* ② *Aspergillus* ③ *Saccharomyces* ④ *Clostridium*

131. In double fertilization of angiosperms, one male gamete fuses with:

① Egg and central cell ② Egg only ③ Central cell only ④ Synergid

132. Pollen grains can be stored for several years in liquid nitrogen having a temperature:

① –196 °C ② –120 °C ③ –80 °C ④ –450 °C

133. Which of the following acts as a physical barrier in innate immunity?

① Saliva ② Skin ③ Interferon ④ Antibody

134. **Fill in the blank:**
The process of maintaining a constant internal environment is called _____.
① Thermoregulation ② Homeostasis ③ Metabolism ④ Phototropism

135. Which of the following gases causes global warming?
① CO_2 ② O_2 ③ H_2 ④ N_2

136. The second law of Mendel is also known as:
① Law of segregation ② Law of independent assortment
③ Law of dominance ④ Law of purity of gametes

137. In human heart, oxygenated blood is present in:
① Left atrium and left ventricle ② Right atrium and right ventricle
③ Left atrium and right ventricle ④ Right atrium and left ventricle

138. The arrangement of nuclei in the normal embryo sac is:
① 3 + 2 + 3 ② 3 + 3 + 2 ③ 2 + 4 + 2 ④ 2 + 3 + 3

139. **Assertion (A) :** Test cross helps to determine genotype.
Reason (R): It is a cross between F_1 hybrid and homozygous recessive parent.
① Both A and R are true and R is the correct explanation of A.
② Both A and R are true but R is not the correct explanation of A.
③ A is true but R is false.
④ A is false but R is true

140. Which one of the following layers of the antral follicle is acellular?
① Theca ② Granuloma ③ Zona pellicida ④ Stroma

141. In a dihybrid cross, if 9:3:3:1 ratio is obtained, it proves:
① Linkage ② Segregation
③ Independent assortment ④ Dominance

142. The molecule that acts as a genetic messenger between DNA and ribosome is:
① tRNA ② rRNA ③ mRNA ④ hnRNA

143. The Okazaki fragments are formed during:
① Leading strand synthesis ② Lagging strand synthesis
③ Transcription ④ Translation

144. DNA polymerase III adds nucleotides to which end of a growing strand?
① 5′ end ② 3′ end ③ Both ends ④ None

145. Which of the following enzymes is used to join DNA fragments?
① DNA polymerase ② DNA ligase ③ RNA polymerase ④ Endonuclease

146. The transfer of genetic material from one bacterium to another by a bacteriophage is called:

① Transformation ② Conjugation ③ Transduction ④ Replication

147. **Assertion (A):** DNA is a better genetic material than RNA.

Reason (R): DNA is more stable and less reactive.

① Both A and R are true and R is the correct explanation of A.

② Both A and R are true but R is not the correct explanation of A.

③ A is true but R is false.

④ A is false but R is true.

148. In a test cross, heterozygous tall pea plants (Tt) are crossed with dwarf (tt). The expected ratio is:

① 3 : 1 ② 1 : 1 ③ 1 : 3 ④ 2 : 1

149. If both parents are heterozygous for a trait, the probability of obtaining a homozygous recessive offspring is:

① ¼ ② ½ ③ ¾ ④ 1

150. Which of the following is a palindrome sequence?

① GAATTC ② AAGTCC ③ CCGTTA ④ GGATCC

151. The enzyme reverse transcriptase synthesizes:

① DNA from RNA template ② RNA from DNA

③ Protein from mRNA ④ RNA from protein

152. The first genetically modified crop approved for commercial cultivation was:

① Bt Cotton ② Golden Rice

③ Flavr Savr Tomato ④ Roundup Ready Soybean

153. Which of the following statements about plasmids is true?

① They are chromosomal DNA ② They can replicate independently

③ They are essential for bacterial survival ④ They cannot carry genes

154. **Match the following:**

a. Restriction enzyme—(i) Joining DNA fragments

b. Ligase—(ii) Cutting DNA

c. Polymerase—(iii) Amplifying DNA

① a–ii, b–i, c–iii ② a–i, b–ii, c–iii ③ a–iii, b–i, c–ii ④ a–ii, b–iii, c–i

155. The separation of DNA fragments according to size is achieved by:

① Gel electrophoresis ② Chromatography ③ Centrifugation ④ PCR

156. In PCR, the enzyme used for DNA synthesis is _____.

① Ligase ② RNA polymerase ③ *Taq* polymerase ④ DNAase

157. In biotechnology, *Agrobacterium tumefaciens* is used as a vector because:

① It produces insulin ② It has Ti plasmid

③ It infects only animals ④ It synthesizes DNA polymerase

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158. The Human Genome Project was completed in:

① 2000 ② 2001 ③ 2003 ④ 2005

159. **Assertion (A):** DNA fingerprinting is based on repetitive DNA sequences.
Reason (R): VNTRs show high degree of polymorphism.

① Both A and R are true and R is the correct explanation of A.
② Both A and R are true but R is not the correct explanation of A.
③ A is true but R is false.
④ A is false but R is true.

160. A patient suffering from ADA deficiency was treated by gene therapy using functional ADA gene. Which technique was used to insert the gene?

① Plasmid ② Retroviral vector
③ Liposome ④ Transformation

161. Which disease is caused due to absence of dystrophin protein?

① Muscular dystrophy ② Phenylketonuria ③ Thalassemia ④ Cystic fibrosis

162. The total number of base pairs in the haploid human genome is approximately:

① 3×10^6 ② 3×10^9 ③ 3×10^{12} ④ 3×10^7

163. In *E. coli*, the regulation of lac operon depends upon the presence or absence of:

① Glucose and lactose ② Maltose and galactose ③ Fructose and sucrose ④ Amino acids

164. The structural gene of the lac operon includes:

① Lac Z, Lac Y, Lac A ② Lac A, Lac R, Lac I ③ Lac P, Lac O, Lac R ④ Lac Z, Lac P, Lac R

165. A couple has a child with blood group O, while the father has blood group A and mother has blood group B. What are the possible genotypes of the parents?

① I^AI^A and I^BI^B ② I^Ai and I^Bi ③ I^AI^A and I^Bi ④ I^Ai and I^BI^B

166. If a woman is a carrier of colour blindness, and her husband is normal, the probability of their son being colour blind is:

① 0 ② 25% ③ 50% ④ 75%

167. Which type of inheritance is shown by haemophilia?

① Autosomal dominant ② Autosomal recessive ③ X-linked recessive ④ Y-linked

168. The ratio 1 : 2 : 1 obtained in F_2 generation is due to:

① Incomplete dominance ② Co-dominance
③ Linkage ④ Epistasis

169. The function of tRNA is to:

① Carry amino acids to ribosome ② Carry genetic code to cytoplasm
③ Form ribosome ④ Synthesize RNA

170. The anticodon is found in:

① rRNA ② tRNA ③ mRNA ④ DNA

171. **Match the following:**

a. Watson and Crick—(i) Transformation

b. Hershey and Chase—(ii) DNA double helix

c. Griffith—(iii) Bacteriophage experiment

① a–ii, b–iii, c–i ② a–iii, b–ii, c–i ③ a–ii, b–i, c–iii ④ a–i, b–ii, c–iii

172. The segment of DNA that codes for a polypeptide is called:

① Cistron ② Intron ③ Exon ④ Codon

173. The process of separation and purification of the expressed protein before marketing is called:

① Upstream processing ② Downstream processing

③ Bioprocessing ④ Biolistics

174. The start codon for translation is _____.

① UAA ② AUG ③ UGA ④ UAG

175. The nucleosome core particle consists of:

① DNA + H1 ② DNA + H2A, H2B, H3, H4

③ RNA + Protein ④ Histones + RNA

176. **Assertion (A):** Okazaki fragments are formed during DNA replication.

Reason (R): DNA synthesis is continuous on both strands.

① Both A and R are true and R is the correct explanation of A.

② Both A and R are true but R is not the correct explanation of A.

③ A is true but R is false.

④ A is false but R is true.

177. In human genome, the number of protein coding genes is about:

① 25,000 ② 2,500 ③ 250,000 ④ 1,000

178. A codon consists of how many nitrogen bases?

① One ② Two ③ Three ④ Four

179. The universal nature of genetic code proves:

① Common ancestry of all life forms ② Different origin of species

③ Polymorphism ④ Mutation

180. Study the flowchart:

DNA → mRNA → Protein → Trait

The above sequence represents:

① Central dogma ② Translation ③ Replication ④ Mutation