

: 939 • TEST DATE : 02-Mar.-2025



LIGHT

INSTITUTE

Foundation

SYLLABUS

TEST SERIES 2024-25

Y-CUM-ENTRANCE TEST

T I O N

S I C S

1. (3) [NCERT XI-I-59]

As the man is stationary with respect to belt, his acceleration is also 1 m/s^2 .

$$\text{Net force on him} = m a = 55 \times 1 = 55 \text{ N}$$

2. (2) [NCERT XI-I-27]

3. (3) [NCERT XI-II-226]

Since particle is at turning point, $K = 0$ therefore $E = 1 = U = (1/2) k x^2$

putting $k = 0.05$, we get $x^2 = 4$ and $x = +2$ and $x = -2$.

4. (1) [NCERT XI-I-95]

5. (3) [NCERT XI-I-242]

6. (3) [NCERT XI-II-281]

The frequency remains the same, λ will be proportional to speed v

7. (3) [NCERT XII-I-23]

Electric field are due to infinite line

$$\text{charge, } E = \frac{\lambda}{2\pi\epsilon_0 r}$$

$$E = \frac{2}{2} \times \frac{\lambda}{2\pi\epsilon_0 r} = \frac{2\lambda}{4\pi\epsilon_0 r}$$

putting the values, we get

$$9 \times 10^4 = \frac{2 \times 9 \times 10^9 \times \lambda}{2 \times 10^{-2}}$$

$$\lambda = \frac{9 \times 10^4 \times 2 \times 10^{-2}}{2 \times 9 \times 10^9}$$

$$= 10^{-7} \text{ Cm}^{-1}$$

8. (2) [NCERT XII-I-112]

Here, $n = 100$, $r = 8 \text{ cm} = 8 \times 10^{-2} \text{ m}$

and $I = 0.40 \text{ A}$

The magnetic field B at the centre,

$$B = \frac{\mu_0}{4\pi} \cdot \frac{2\pi In}{r} = \frac{10^{-7} \times 2 \times 3.14 \times 0.4 \times 100}{8 \times 10^{-2}}$$

$$= 3.1 \times 10^{-4} \text{ T}$$

9. (1) [PYQ Modified]

Here, the point P is on the right side of lens acts as a virtual object.

Given, distance of object from the lens

$$u = 12 \text{ cm}$$

Focal length of convex lens $f = +20 \text{ cm}$

Using Lens formula,

$$\frac{1}{v} - \frac{1}{u} = \frac{1}{f} \Rightarrow \frac{1}{v} - \frac{1}{12} = \frac{1}{20}$$

$$\frac{1}{v} = \frac{1}{20} + \frac{1}{12} = \frac{3+5}{60} = \frac{8}{60}$$

$$v = 7.5 \text{ cm}$$

Thus, the beam converges on the right side of lens at a distance of 7.5 cm.

10. (3) [NCERT XII-II-266]

$$\lambda = 500 \text{ nm}$$

$$= 500 \times 10^{-9} \text{ m } D = 1 \text{ m, } n = 1, x = 2.5 \text{ mm}$$

$$= 2.5 \times 10^{-3} \text{ m}$$

$$x = \frac{nD\lambda}{d}$$

$$d = \frac{nD\lambda}{x} = \frac{1 \times 1 \times 500 \times 10^{-9}}{2.5 \times 10^{-3}}$$

$$= 2 \times 10^{-4} \text{ m} \Rightarrow d = 0.2 \text{ mm}$$

11. (4) [NLI Expert]

$$v = \sqrt{2gH}$$

$$\therefore \lambda = \frac{h}{P} = \frac{h}{mv} = \frac{h}{m\sqrt{2gH}}$$

$$\Rightarrow \lambda \propto H^{-1/2}$$

12. (3) [NCERT XII-II-297]

For a hydrogen like atom

$$r_n = 0.53 \frac{n^2}{Z}$$

For (ground state)

13. (3) [NCERT XII-II-233]

14. (1) [NCERT XI-II-280]

15. (1) [NCERT XI-II-170]

The self-weight acts at the center of mass of the wire which is middle point. Thus in formula we will take effective length as $L/2$.

16. (3) [NCERT XII-II-276]

The new frequency of light is $(1.5/2) = 0.75$ times the threshold frequency and which is less than it. hence no emission will take place and photoelectric current will be zero.

17. (4) [NCERT XI-I-63]

18. (2) [NCERT XI-II-253]

19. (3) [PYQ Modified Manipur 2022]

$$i = q \times n = q \times \frac{1}{T} = q \times \frac{v}{2\pi r}$$

20. (3) [NCERT XII-I-71]

$$\text{Use the formula } \theta = \frac{C_1 \times 120 + C_2 \times 200}{C_1 + C_2}$$

21. (2) [NCERT XI-I-73]

use work energy theorem

$$W = \frac{1}{2} m \{ [v(x=2)]^2 - [v(x=0)]^2 \}$$

22. (1) [NCERT XI-II-248]

$$\sqrt{\frac{3RT}{39}} = \sqrt{\frac{3R(273+20)}{4}}$$

$$\text{Gives } T = 2.85 \times 10^3 \text{ K}$$

23. (1) [NLI Expert]

$$R_A = \rho \frac{L}{\frac{\pi D^2}{4}}, \quad R_B = \rho \frac{L}{\frac{\pi [(2D)^2 - D^2]}{4}}$$

$$\frac{R_A}{R_B} = \frac{3}{1}$$

24. (1) [NCERT-XII-I-29]

$$e = -\frac{d\phi}{dt} = -(0.1)[2t - 6]$$

Now sketch.

25. (4) [NLI Expert]

$$W = \Delta U = \frac{1}{2} C (V_2^2 - V_1^2)$$

$$\frac{W_1}{W} = \frac{15^2 - 10^2}{10^2 - 5^2} = \frac{125}{75} = \frac{5}{3} \Rightarrow W = 1.67W$$

26. (3) [NCERT-XII-I-117]

$$R = \frac{mV}{qB} = \frac{\sqrt{2Km}}{qB} \quad R \propto \sqrt{K}$$

27. (3) [NCERT-XII-I-112]

$$\frac{\mu_0}{4\pi} \frac{2(5-2.5)}{2.5} = \frac{\mu_0}{2\pi}$$

28. (3) [NCERT-XI-II-233]

$$-20 - (-8) = U_2 - 30 \quad U_2 = 18 \text{ J.}$$

29. (4) [NCERT-XII-I-154]

Induced charge depends upon change in flux, not the speed.

30. (2) [NCERT-XI-I-59]

$$S = 15 \times 10 + \frac{1}{2} \frac{600 - 250}{1400} \times 10^2$$

$$= 150 + \frac{1}{2} \frac{350}{14} = 150 + \frac{25}{2} = 162.5 \text{ m}$$

31. (3) [NTA]

32. (3) [NCERT-XI-I-15]

$$v_A = 36 \text{ kmh}^{-1} = 36 \times \frac{5}{18} = +10 \text{ ms}^{-2}$$

$$v_B = +54 \text{ kmh}^{-1} = +54 \times \frac{5}{18} = +15 \text{ ms}^{-1}$$

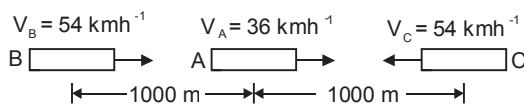
$$v_C = -54 \text{ kmh}^{-1} = -54 \times \frac{5}{18} = -15 \text{ ms}^{-1}$$

Relative velocity of C w.r.t A,

$$v_{CA} = v_C - v_A = -15 - 10 = -25 \text{ ms}^{-1}$$

∴ Time that C requires to just cross

$$A = \frac{1 \text{ km}}{v_{CA}} = \frac{1000 \text{ m}}{25 \text{ ms}^{-1}} = 40 \text{ s}$$



In order to avoid the accident the accident, B must overtake A in a time less than 40 s. So, for car B we have

Relative velocity of car B w.r.t. A,

$$v_{BA} = v_B - v_A = 15 - 10 = 5 \text{ ms}^{-1}$$

$$\therefore s = 1 \text{ km} = 1000 \text{ m}, u = 5 \text{ ms}^{-1}, t = 40 \text{ s}$$

$$\text{As, } s = ut + \frac{1}{2} at^2$$

$$\therefore 1000 = 5 \times 40 + \frac{1}{2} a \times (40)^2$$

$$\text{or } 1000 = 200 + 800a \text{ or } a = 1 \text{ ms}^{-2}$$

33. (2) [NLI Expert]

34. (4) [PYQ Modified]

35. (3) [NLI Expert]

36. (4) [PYQ Modified Jhajjhar]

37. (3) [NLI Expert]

Potential energy of simple harmonic oscillator

$$= \frac{1}{2} m \omega^2 y^2$$

$$\text{for } y = \frac{a}{2}, \text{ P.E} = \frac{1}{2} m \omega^2 \frac{a^2}{4}$$

$$\Rightarrow \text{P.E} = \frac{1}{4} \left(\frac{1}{2} m \omega^2 a^2 \right) = \frac{E}{4}$$

38. (2) [NCERT-XII-II-334]

In forward bias, resistance of diode will be zero.

$$i = \frac{V_A - V_B}{R}$$

$$= \frac{4 - (-6)}{1 \times 10^3}$$

$$i = \frac{10}{10^3} = 10^{-2} \text{ amp}$$

39. (2) [NCERT-XII-I-100]

$$\frac{5}{l_1} = \frac{R}{100 - l_1} \quad \text{---(1)}$$

By second condition

$$\frac{5}{1.6 l_1} = \frac{R/2}{100 - 1.6 l_1} \quad \text{---(2)}$$

$$1.6 = \frac{2(100 - 1.6 l_1)}{100 - 1.6 l_1}$$

$$1.6 \times 100 - 1.6 l_1 = 2(100 - 1.6 l_1)$$

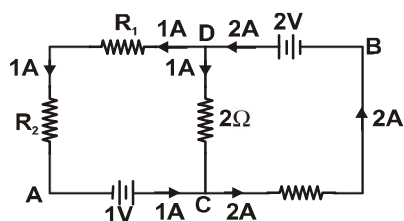
$$0.8 \times 100 - 0.8 l_1 = 100 - 1.6 l_1$$

$$0.8 l_1 = 100 \times 0.2$$

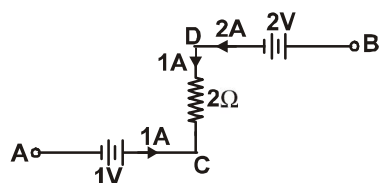
$$l_1 = 25$$

$$\text{by eq (1)} \quad \frac{5}{25} = \frac{R}{75} \Rightarrow R = 15 \text{ ohm}$$

40. (1) [Experimental skills]



Applying Kirchoff voltage law in the circuit as shown in the figure below.



$$\therefore V_A + 1 + 2(1) - 2 = V_B$$

$$0 + 1 = V_B \quad \{ \because V_A = 0V \text{ (Given)} \}$$

$$V_B = +1V.$$

41. (1) [NLI Expert]
42. (4) [Experimental skill]

$(\mu)_{\text{Prism}} = \sqrt{2}$
Prism angle (A) = 30°
Retracing path take place when ray fall normally to silvered surface
 $\Rightarrow i_2 = 0 \Rightarrow r_2 = 0 \quad r_1 = A = 30^\circ$

$$\left(\frac{\sin i}{\sin r} = \frac{\mu_2}{\mu_1} \right)_{\text{At first face}}$$

$$\frac{\sin i_1}{\sin r_1} = \frac{\sqrt{2}}{1} \Rightarrow \sin i_1 = \sqrt{2} \times \sin 30^\circ$$

$$\sin i_1 = \frac{1}{\sqrt{2}} \Rightarrow i_1 = 45^\circ$$

43. (4) [NCERT-XII-II-297]

44. (4) [NCERT-XI-I-59]

$$mv_1 + Mv_2 = 0 \text{ where } \frac{1}{2}mv_1^2 + \frac{1}{2}Mv_2^2 = mgh$$

$$v_1 = -\frac{Mv_2}{m} \text{ So, } \frac{1}{2}m\left(-\frac{Mv_2}{m}\right)^2 + \frac{1}{2}Mv_2^2 = mgh$$

$$v_2^2 = \left(\frac{M^2}{m} + M\right) = 2mgh$$

$$v_2 = \sqrt{\frac{2mgh m}{M(M+m)}} = \frac{m}{M} \sqrt{2Mgh}$$

45. (1) [NLI Expert]

ISTRY

46. (1) [NCERT-XI-18]

Elements	moles	Simple ratio	E.F
C	$\frac{40}{12} = 3.33$	1	CH ₂ O
H	$\frac{6.66}{1} = 6.66$	2	
O	$\frac{53.4}{16} = 3.33$	1	

47. (4) [NCERT-XII-121]

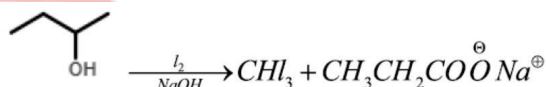
Both carbon and nitrogen can work as donating site in CN⁻ hence it is an ambidentate ligand.

48. (2) [NCERT-XII-76]

$$t_{1/2} = \frac{0.693}{k}$$

$$= \frac{0.693}{0.02} = 34.65s$$

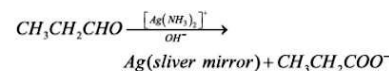
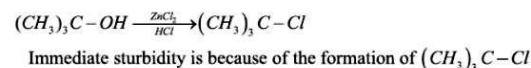
49. (2) [NCERT-XII-240]



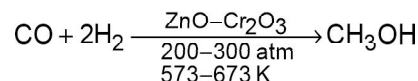
50. (1) [NCERT-XII-109]

Long	Radii(pm)
Nd ³⁺	99
Tb ³⁺	92
Tm ³⁺	87

51. (4) [Practical Chemistry]



52. (4) [PYQ Mod.]



53. (1) [PYQ Mod.]

Order of acidic strength is
Carboxylic acids > Phenols > Alcohols

54. (1) [NCERT-XII-291]

Lysine is a basic amino acid as it has more number of $-NH_2$ groups than $-COOH$ groups.




55. (2) [NCERT-XII-293]

In DNA, C joins with G by three hydrogen bonds.

56. (1) [NCERT-XII-37]

$$E = E^\circ = -\frac{0.059}{n} \log Q$$

57. (3) [NCERT-XII-169]

Compounds	B.P. (K)
	453
	446
	448

58. (1) [PYQ Mod.]

59. (2) [NCERT-XI-51]

$$\Delta v = \frac{h}{4\pi m \Delta x} = \frac{6.626 \times 10^{-34} \text{ Js}}{4 \times \frac{22}{7} \times 9.11 \times 10^{-31} \text{ kg} \times 10^{-8} \text{ m}}$$

60. (3) [NCERT-XII-132]

$$\Delta \propto \bar{v}$$

$$\bar{v}_0 = \frac{4}{9} \bar{v}_r$$

61. (2) [NCERT-XII-5]

$$\frac{X_{\text{Solute}}}{X_{\text{Solvent}}} = \frac{\frac{n_{\text{Solute}}}{n_{\text{solute}} + n_{\text{Solvent}}}}{\frac{n_{\text{Solvent}}}{n_{\text{solute}} + n_{\text{Solvent}}}} = \frac{n_{\text{solute}}}{n_{\text{solvent}}}$$

$$\text{Molarity} = \frac{\text{number of moles of solute}}{\text{Volume of solution in litres}}$$

So, option (1) and (4) are correct.

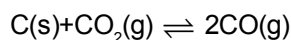
62. (1) [NCERT-XI-47]

$$r_n \propto n^2$$

63. (2) [NCERT-XI-91]

Negative electron gain enthalpy of fluorine is less than chlorine while is more than the chlorine.

64. (2) [NCERT-XI-180]



$$\frac{(10P_{CO_2})^2}{P_{CO_2}} = 60$$

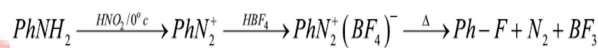
65. (4) [NCERT-XII-100]

Pb_4 is not stable.

66. (2) [p-Block]

Nitrogen exhibits +5 oxidation state but does not form pentahalides because it does not have d-orbitals to expand its covalence beyond four.

67. (4) [NCERT-XII-276]



68. (1) [NCERT-XII-18]

$$\Delta T_f = i m K_f$$

For the solutions of same m and K_f

$$\Delta T_f \propto i$$

$$\text{For } C_6H_{12}O_6 \Rightarrow i = 1$$

$$KCl \Rightarrow i = 2$$

$$Na_2SO_4 \Rightarrow i = 3$$

$$Al_2SO_4 \Rightarrow i = 5$$

Minimum i is for glucose so ΔT_f will be minimum for it and freezing point will be maximum for glucose.

69. (3) [NCERT-XII-24]

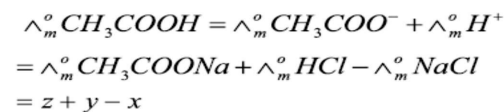
$$\pi = CRT$$

$$\pi_1 = \pi_2$$

$$\frac{20}{60 \times 1} = \frac{10 \times 1000}{\text{Mol. wt}_{(B)} \times 100}$$

$$\text{Molar mass of B} = \frac{600}{2} = 300 \text{ g/mol}$$

70. (3) [NCERT-XII-46]



71. (3) [NCERT-XII-69]

$$\text{Rate} = k [NO]^2 [Br_2]$$

72. (2) [NCERT-XII-79]

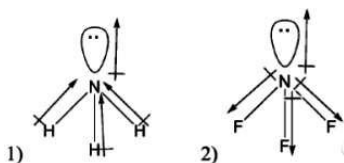
Arrhenius equation is to be employed.

73. (1) [NCERT-XI-130]

	Species		Bond Order
(a)	O_2^+	(i)	2.5
(b)	O_2^-	(ii)	1.5
(c)	O_2^{2+}	(iii)	1
(d)	O_2	(iv)	2

Bond length decreases as bond order increases.

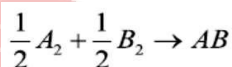
74. (1) [NCERT-XI-111]



75. (4) [PYQ Mod.]

Wurtz reaction is useful to prepare symmetrical alkanes with even number of carbon atoms.

76. (4) [NCERT-XI-154]



$$\Delta_r H = \sum BE_{\text{Reactant}} - \sum BE_{\text{Products}}$$

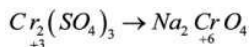
$$\frac{1}{2}a + \frac{1}{2}b - c$$

$$\Delta_r H = \frac{a}{2} + \frac{b}{2} - c$$

77. (2) [p-Block]

Tl predominantly exists in +1 oxidation state, due to inert pair effect.

78. (4) [PYQ Mod.]



- Change in oxidation state of Cr per atom = 3
- As there are two Cr atoms in $Cr_2(SO_4)_3$ so the total changes or total transfer of electrons = $3 \times 2 = 6$
- Equivalent weight of $Cr_2(SO_4)_3 = M/6$

79. (2) [NCERT-XII-46]

The plot of Λ_m vs \sqrt{C} for strong electrolyte is a straight line with negative slope.

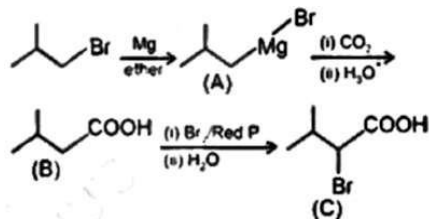
80. (2) [NCERT-XII-125]

- $[Co(NH_3)_6][Cr(CN)_6]$ can show Coordination isomerism
- $[Fe(H_2O)_5 Cl]Br$ can show Ionisation isomerism
- $[PtCl_2(NH_3)_2]$ can show Geometrical isomerism
- $K_3[Co(OX)_3]$ can show Optical isomerism

81. (4) [PYQ Mod.]

Rate of both endothermic and exothermic reaction increase with increase in temperature.

82. (2) [PYQ Mod.]



83. (3) [NCERT-XI-61]

Subshell = 3d

Maximum number of electrons in d subshell is 10.

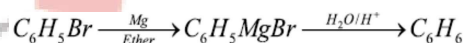
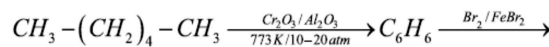
84. (1) [PYQ Mod.]

Acidic strength increases as pKa decreases. HCOOH has least pKa value so it will be strongest acid among the following.

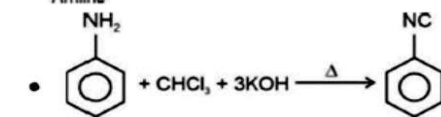
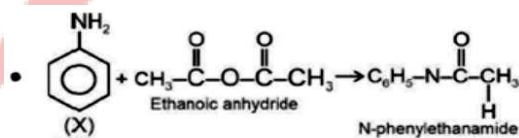
85. (1) [NCERT-XI-275]

- NO₂ → -R and -I effect
- O- → +R and +I effect
- O-CH₃ → +R and -I effect
- CH₃ → +I effect.

86. (1) [NCERT-XI-304]

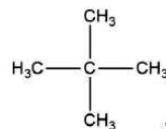


87. (2) [PYQ Mod.]

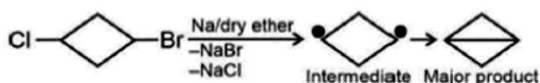


- Pyridine is more basic than aniline because in aniline the lone pair of nitrogen is delocalized.

88. (2) [Exemplar]



89. (2) [PYQ Mod.]



90. (1) [PYQ Mod.]

Work is a path function, therefore will not be zero for a cyclic process whereas rest all are state functions.

BIOLOGY

91. (1) [NCERT-I-115 to 118]

Statement I:

During the chemical reaction no change in enzyme molecule.

Statement II :

In some enzymes a non protein constituent called cofactor is bound to the enzyme to make the enzyme catalytically active.

92. (3) [NCERT-I-100]

Non-membranous nucleoplasmic structures in nucleus are the site for active synthesis of rRNA

93. (2) [NCERT-I-89, 90]

Double stranded circular naked DNA – nucleic acid is present in an organism having 70 S ribosomes only

94. (2) [NCERT-I-126 to 128]

After meiosis I, the resultant daughter cells have
(2) twice the amount of DNA in comparison to haploid gametes

95. (2) [NCERT-I-106, 107]

Phospholipid – organic compound is the main constituent of Lecithin

96. (2) [NCERT-I-94]

The main difference between active and passive transport across cell membrane is :

(2) passive transport requires a concentration gradient across a biological membrane whereas active transport requires energy to move solutes.

97. (1) [NCERT-II-26]

(1) Gametogenesis → Gamete transfer → Syngamy → Zygote → Cell division (Cleavage) → Cell differentiation → Organogenesis

98. (4) [NCERT-II-33 to 35]

No new follicles develop in the luteal phase of the menstrual cycle because

(4) Both FSH and LH levels are low in the luteal phase

99. (2) [NCERT-II-92]

(2) 5' UACGUACGUACGUAC 3'

100. (3) [NCERT-I-42 to 44]

- (1) Flatworms – General body surface
- (2) Sponges – General body surface
- (3) Aquatic arthropods – Gills
- (4) Coelenterates – General body surface

101. (1) [NCERT-II-169]

The two antibiotic resistance genes on vector pBR 322 are for

- (1) Ampicillin and Tetracycline

102. (2) [NCERT-II-185]

Exploitation of bioresources of a nation by multinational companies without authorization from the concerned country is referred to as Biopiracy

103. (1) [NCERT-II-61]

In a marriage between male with blood group A and female with blood group B, the progeny had either blood group AB or B. The possible genotype of parents is – I^A i (Male) ; I^B I^B (Female)

104. (2) [NCERT-I-248]

- (2) A = Protein Hormone; B = Receptor; C = Cyclic AMP

105. (3) [NCERT-II-134 to 136]

Humans have acquired immune system that produces antibodies to neutralize pathogens. Still innate immune system is present at the time of birth because it

- (3) has natural killer cells which can phagocytose and destroy microbes

106. (1) [NCERT-I-227]

Myasthenia gravis disease is an auto-immune disorder

107. (1) [NCERT-II-130 to 133]

- | | |
|-----------------------------|--------------|
| A. Microsporium | I. Fungi |
| B. Entamoeba histolytica | II. Protozoa |
| C. Wuchereria malayi | III. Animal |
| D. Streptococcus pneumoniae | IV. Bacteria |

108. (2) [NCERT-I-243]

Fall in blood Ca⁺² levels – will stimulate parathyroid gland to release parathyroid hormone

109. (3) [NCERT-II-44, 45]

- (3) IUDs increase phagocytosis of sperms in the uterus.

- 110. (3) [NCERT-II-47]**
AIDS and Hepatitis B – sexually transmitted diseases do not specifically affect reproductive organs
- 111. (2) [NCERT-I-41 to 45]**
(a) Ophiura (iii) Echinodermata
(b) Physalia (iv) Coelenterata
(c) Pinctada (i) Mollusca
(d) Planaria (ii) Platyhelminthes
- 112. (4) [NCERT-I-43]**
Annelids are true coelomates with bilateral symmetry
- 113. (3) [Old-NCERT-I]**
(a) Tight junctions (iii) Establish a barrier to prevent leakage of fluid across epithelial cells
(b) Adhering junctions (i) Cement neighbouring cells together to form sheet
(c) Gap junctions (iv) Cytoplasmic channels to facilitate communication
(d) Synaptic junctions (ii) Transmit information through chemical to another cells
- 114. (2) [NCERT-I-187]**
The maximum volume of air a person can breathe in after a forced expiration is known as Vital Capacity
- 115. (4) [NCERT-I-199 to 201]**
- 116. (4) [NCERT-I-199 to 201]**
- 117. (2) [NCERT-I-21]**
Mad cow disease in cattle is caused by an agent which has Abnormally folded protein
- 118. (3) [NCERT-I-61]**
Alstonia – shows whorled phyllotaxy
- 119. (1) [NMC Syllabus]**
Bicarpellary, Syncarpous ovary is seen in Brassica.

- 120. (2) [NCERT-II-10, 11]**
The most common type of embryo sac in angiosperms
(2) Monosporic with three sequential mitotic divisions
- 121. (4) [NCERT-II-96]**
the correct combination of salient features of Genetic Code
(4) Degenerate, Non-overlapping, Non ambiguous
- 122. (3) [NCERT-II-85, 86]**
Hershey and Chase – scientist experimentally proved that DNA is the sole genetic material in bacteriophage
- 123. (3) [NCERT-II-94, 95]**
In the process of transcription in Eukaryotes, the RNA polymerase I transcribes -
(3) rRNAs - 28 S, 18 S and 5.8 S
- 124. (2) [NCERT-II-75, 76]**
Klinefelter's Syndrome – each cell in the affected person, has three sex chromosomes XXY
- 125. (2) [NCERT-II-196 to 202]**
the correct match for population interactions
(1) Predator and prey = + and –
(2) Liver fluke and human = + and –
(3) Cuckoo and crow = + and –
(4) Sea anemone and clown Fish = + and 0
- 126. (3) [NCERT-II-114, 115]**
(3) Both (A) and (R) are correct and (R) is the correct explanation of (A)
- 127. (2) [NCERT-I-117, 118]**
prosthetic groups are tightly bound to apoenzymes while coenzyme is loosely bound
- 128. (2) [NCERT-I-126]**
Crossing over takes place between Non-sister chromatids of homologous chromosomes at Pachytene stage of prophase I of the cell cycle
- 129. (3) [NCERT-I-159, 160]**
the respiratory electron transport system (ETS) located in Inner mitochondrial membrane of cell in plants
- 130. (3) [NCERT-I-145 to 147]**
In Hatch and Slack pathway, the primary CO₂ acceptor is Phosphoenol pyruvate

- 131. (4)** [NCERT-I-134, 135]
One scientist cultured *Cladophora* in a suspension of *Azotobacter* and illuminated the culture by splitting light through a prism. He observed that bacteria accumulated mainly in the region of Blue and red light
- 132. (3)** [NCERT-I-176]
In order to increase the yield of sugarcane crop, Gibberellins plant growth regulators should be sprayed
- 133. (1)** [NCERT-II-13]
The type of pollination takes place in *Vallisneria*
(1) Pollination occurs in submerged condition by water.
- 134. (2)** [NCERT-II-15]
Papaya – both autogamy and geitonogamy are prevented
- 135. (1)** [NCERT-II-224]
Endemic – Western Ghats have a large number of plant and animal species that are not found anywhere else.
- 136. (4)** [NCERT-II-201, 202]
Mutualism – Female wasp and fig species
- 137. (3)** [NCERT-II-143]
Coca alkaloid or cocaine is obtained from
(3) *Erythroxylum coca*
- 138. (3)** [NCERT-II-157, 158]
the following pairs of microbes, which pair has both the microbes that can be used as biofertilizers
(3) Cyanobacteria and *Rhizobium*
- 139. (2)** [NCERT-II-165 to 167]
An enzyme catalysing the removal of nucleotides from DNA is Endonuclease
- 140. (1)** [NCERT-II-180]
In RNAi, the genes are silenced using dsRNA
- 141. (2)** [NCERT-II-35 to 38]
A. Trophoblast iii. Outer layer of blastocyst attached to the endometrium
B. Cleavage iv. Mitotic division of zygote
C. Inner cell mass ii. Group of cells that would differentiate as embryo
D. Implantation i. Embedding of blastocyst in the endometrium

- 142. (3)** [NCERT-II-170, 171]
Significance of 'heat shock' method in bacterial transformation is to facilitate
(3) Uptake of DNA through transient pores in the bacterial cell wall
- 143. (3)** [NCERT-II-165, 166]
Entamoeba coli is not a source of restriction endonuclease
- 144. (3)** [NCERT-II-182, 183]
Pathophysiology is the Study of altered physiology of host
- 145. (4)** [NCERT-II-191]
146. (2) [NCERT-II-225]
The common to the techniques (i) in vitro fertilisation, (ii) Cryopreservation and (iii) Tissue culture
(2) All are Ex-situ conservation methods
- 147. (3)** [NCERT-II-222, 223]
(1) *Parthenium* is an exotic species of our country
(2) African cat fish is a threat to indigenous cat fishes
(3) Steller's sea cow is an extinct animal
(4) *Parthenium* is popularly known as carrot grass
- 148. (4)** [NCERT-I-20, 21]
A. TMV – RNA is infectious
B. Bacteriophage – DNA is infectious
C. Viroids – RNA is infectious
D. Lichen – Two types of organism involved
- 149. (1)** [NCERT-I-71 to 77]
A. Cuticle iii. Waxy layer
B. Bulliform cells iv. Empty colourless cell
C. Stomata i. Guard cells
D. Epidermis ii. Single layer
- 150. (3)** [Old-NCERT-I]
Cells of this tissue are living and show angular wall thickening. They also provide mechanical support. The tissue is Collenchyma
- 151. (3)** [Old-NCERT-I]
152. (3) [Old-NCERT-I]
The statements is true for cockroach
(1) The number of ovarioles in each ovary are eight
(2) The larval stage is called Nymph
(3) Anal styles are absent in females
(4) They are uricotelic

- 153. (2) [Old-NCERT-I]**
- | | |
|------------------|--------------------------------------|
| A. Phallomere | iv. The external genitalia |
| B. Gonopore | iii. Opening of the ejaculatory duct |
| C. Spermatophore | ii. Bundles of sperm |
| D. Ovarioles | i. Chain of developing ova |

154. (2) [NCERT-I-121, 122]

the correct statement about G_1 phase

- (1) Cell is metabolically active
- (2) DNA in the cell does not replicate
- (3) It is a phase of synthesis of macromolecules
- (4) Cell in growing stage

155. (3) [NCERT-I-137]

400 – 700 = The range of wavelength (in nm) is called photosynthetically active radiation (PAR)

156. (1) [NCERT-I-175 to 178]

- | | |
|---------------|-----------------------|
| A. 2,4-D | iv. Weed - free lawns |
| B. ABA | iii. Stomata closure |
| C. Ethylene | v. Ripening of fruits |
| D. GA | ii. Bolting |
| E. Cytokinins | i. Herring sperm DNA |

157. (2) [NCERT-I-212]

- (1) Renin– prevents conversion of angiotensinogen in blood to angiotensin
- (2) Aldosterone – Facilitates water reabsorption
- (3) ADH ANF – enhances sodium reabsorption
- (4) ANF – causes vasodilation

158. (3) [NCERT-I-213, 214]

Dialysing unit (artificial kidney) contains a fluid which is almost same as plasma except that it has No urea

159. (1) [NCERT-I-232, 233]

Potential difference across resting membrane is negative. This is due to differential distribution of Na^+ and K^+

160. (1) [NCERT-I-232 to 235]

- | | |
|-----------------------|---|
| (A) Resting potential | iii. Electrical potential difference across the resting neural membrane |
| (B) Nerve impulse | iv. An electrical wave like response of a neuron to a stimulation |
| (C) Synaptic cleft | ii. Gap between the pre synaptic and post synaptic neurons |
| (D) Neurotransmitters | i. Chemicals involved in the transmission of impulses at synapses |

161. (1)

[NCERT-II-120, 121]

162. (2)

[NCERT-II-111 to 119]

- | | |
|-----------------|------------------------------------|
| A. Darwin | iv. Evolution by natural selection |
| B. Oparin | i. Abiogenesis |
| C. Lamarck | ii. Use and disuse of organs |
| D. Hugo devries | iii. Mutation theory |

163. (1)

[NCERT-I-47, 48]

The correct statement for supar class pisces

- a. In chondrichthyes claspers are present in male
- b. Air bladder regulates buoyancy in osteichtyes
- c. Heart is two chambered
- d. Members of pisces are called true fish

164. (1) [NCERT-I-61 to 65] [NMC Syllabus]

The correct statement for sunflower

- a. It is the member of asteraceae family
- b. The placenta develops at the base of ovary and a single ovule is attached to it
- c. A single leaf arise at each node in alternate manner
- d. Ovary inferior

165. (2)

[NCERT-I-8]

- | Class | Phylum/Division |
|--------------------|-----------------|
| A. Mammalia | Chordata |
| B. Insecta | Arthropoda |
| C. Dicotyledonae | Angiospermae |
| D. Monocotyledonae | Angiospermae |

166. (1) [NCERT-I-106, 107]

Amino acid	R group
A. Glycine	Hydrogen
B. Alanine	A methyl group
C. Serine	Hydroxymethyl group

167. (2) [NCERT-II-73, 74]

The correct match for colourblind

- (1) X^cY – colourblind man
- (2) X^cX – carrier woman
- (3) X^cX^c – colourblind women
- (4) XY – normal man

168. (4) [NCERT-II-73 to 76]

- A. Haemophilia – Sex linked recessive
- B. Thalassaemia – Genetic disorder
- C. Cystic fibrosis – Mendelian disorder
- D. Turner syndrome – Chromosomal disorder

169. (2) [NCERT-II-55]

The correct match for mendel experiment

Dominant	Recessive
A. Axial	Terminal
B. Round	Wrinkled
C. Tall	Dwarf
D. Green colour of pod	Yellow colour of pod

170. (1) [NCERT-I-221, 222]

The correct statements regarding mechanism of muscle contraction :

- A. It is initiated by a signal sent by CNS via motor neuron.
- B. Neurotransmitter generates action potential in the sarcolemma.
- C. Increased Ca^{++} level leads to the binding of calcium with troponin on actin filaments.
- D. Unmasking of active site for actin is activated.
- E. Utilising the energy from ATP hydrolysis to form cross bridge.

171. (4) [NCERT-II-205, 206]

The correct statement about ecosystem? :

- (1) It can vary from small sized pond to large sized sea
- (2) It may be anthropogenic in origin
- (3) It may be temporary or Permanent
- (4) It involves the function of flow of energy and recycling of nutrients also

172. (4) [NCERT-II-210]

- | | |
|-----------------------|-----------|
| A. Tertiary consumer | II. Lion |
| B. Secondary consumer | III. Wolf |
| C. Primary consumer | IV. Goat |
| D. Primary producer | I. Grass |

173. (2) [NCERT-I-156 to 159]

- | | |
|--------------------------------|---------------|
| (1) Dihydroxyacetone Phosphate | - Glycolysis |
| (2) Fumaric Acid | - Krebs cycle |
| (3) OAA | - Krebs cycle |
| (4) 3-Phosphoglyceric Acid | - Glycolysis |

174. (4) [NCERT-II-134, 135]

- | | |
|---------------------------|--|
| (1) Physical barrier | - Mucus coating of the epithelium lining Respiratory tract |
| (2) Physiological barrier | - Saliva in the mouth |
| (3) Cellular barrier | - Leukocytes |
| (4) Cellular barrier | - Macrophage in tissues |

175. (4) [NCERT-II-90, 91]

The correct statements for Replication:

- (1) Any mistake during replication would result into mutations.
- (2) The DNA dependent DNA polymerases catalyse polymerisation only in one direction, that is $5' \rightarrow 3'$
- (3) The replication of DNA and cell division cycle should be highly co-ordinated.

176. (4) [NCERT-I-23, 24]**Statement I:**

For plants the earliest systems of classification used only gross superficial morphological characters such as habit, colour number and shape of leaves etc.

Statement II :

Natural classification systems were based on natural affinities among the organisms and consider, not only external features, but also internal features, like ultrastructure, anatomy, embryology and phytochemistry.

177. (4) [NCERT-I-28 to 33]

Statement I:

In Sphagnum male and female gametophyte are independent free living existence.

Statement II :

In Pinus male and female gametophyte are not independent free living existence.

178. (2) [NCERT-I-65 to 67]

Statement I:

Fruits is a mature or ripened ovary developed after fertilisation.

Statement II :

In fleshy types of fruit pericarp is clearly differentiated into epicarp, mesocarp and endocarp.

179. (4) [NCERT-I-79 to 80]

Statement I:

In case of plants or microbes the term morphology precisely means only the study of form or externally visible features.

Statement II :

The word anatomy conventionally is used for the study of morphology of internal organs in the animals.

180. (2) [Old-NCERT-I]

Statement I:

In cuboidal epithelium the cells are compactly packed with little intercellular matrix.

Statement II :

The salivary gland is exocrine gland so it is not secrete hormone.