

NEET (UG) – 2027 PRACTICE EXAMINATION MOST-EXPECTED FULL SYLLABUS TEST BOOKLET			SET 1
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Candidate	Aamirah Fathima	Test Booklet Set	1
Time Allowed	3 hours 20 minutes (200 minutes)	Maximum Marks	720
Total Questions	180 (all compulsory)	Marking Scheme	+4 for correct, –1 for incorrect, 0 if not attempted
Subjects	Physics (Q.1–45) Chemistry (Q.46–90) Botany (Q.91–135) Zoology (Q.136–180)		

IMPORTANT INSTRUCTIONS

1. The Test Booklet consists of **180 questions**. The maximum marks are **720**.
2. There are four parts in the question paper, viz. Physics, Chemistry, Botany and Zoology, consisting of **45 questions each**. All questions are compulsory.
3. Each question carries **4 marks**. For every correct response 4 marks will be awarded. For every incorrect response **one mark** will be deducted. No deduction is made for questions not attempted.
4. Only **one** option out of the four given against each question is correct. Darken the appropriate circle on the answer sheet with a ball point pen. More than one darkened circle will be treated as an incorrect response.
5. Use of electronic calculators, log tables, mobile phones or any other electronic device is **not permitted**.
6. Rough work is to be done on the space provided in this Test Booklet only. Do not write anything on the answer sheet other than the required entries.
7. Values of physical constants, wherever required, are to be taken as: $g = 10 \text{ m s}^{-2}$, $c = 3 \times 10^8 \text{ m s}^{-1}$, $N_A = 6.022 \times 10^{23} \text{ mol}^{-1}$, $R = 8.314 \text{ J K}^{-1} \text{ mol}^{-1}$.
8. The syllabus followed is the rationalised NCERT syllabus notified for NEET (UG). Deleted chapters have not been examined.
9. Do not check the answer key until the full paper has been attempted under timed conditions.

<i>SPACE FOR ROUGH WORK</i>

PHYSICS

1. The dimensional formula of Planck's constant is the same as that of

- | | |
|---------------------|----------------------|
| (1) Linear momentum | (2) Angular momentum |
| (3) Energy | (4) Power |

2. The percentage errors in the measurement of mass and speed of a body are 2% and 3% respectively. The maximum error in the calculated kinetic energy is

- | | |
|---------|--------|
| (1) 5% | (2) 8% |
| (3) 11% | (4) 2% |

3. A ball thrown vertically upward returns to the thrower after 6 s. The maximum height reached is ($g = 10 \text{ m s}^{-2}$)

- | | |
|----------|----------|
| (1) 30 m | (2) 45 m |
| (3) 60 m | (4) 90 m |

4. For a projectile, the ratio of maximum height to horizontal range is 1 : 4. The angle of projection is

- | | |
|----------------|----------------|
| (1) 30° | (2) 37° |
| (3) 45° | (4) 60° |

5. A body of mass 2 kg moving with 5 m s^{-1} is brought to rest in 0.1 s. The average retarding force is

- | | |
|-----------|-----------|
| (1) 10 N | (2) 50 N |
| (3) 100 N | (4) 200 N |

6. The minimum coefficient of friction required to prevent a block from sliding down a 30° incline is

- | | |
|----------|----------|
| (1) 0.25 | (2) 0.50 |
| (3) 0.58 | (4) 0.87 |

7. A body moving with velocity v makes a head-on elastic collision with an identical body at rest. After collision the first body

- | | |
|-----------------------|---------------------|
| (1) Moves with $v/2$ | (2) Comes to rest |
| (3) Rebounds with v | (4) Moves with $2v$ |

8. A pump lifts 100 kg of water per second through a height of 10 m. Its power output is ($g = 10 \text{ m s}^{-2}$)

- | | |
|------------|------------|
| (1) 1 kW | (2) 10 kW |
| (3) 100 kW | (4) 1000 W |

9. The ratio of the moment of inertia of a uniform rod about an axis through one end to that about an axis through its centre (both $\perp$ to rod) is

- | | |
|-----------|-----------|
| (1) 1 : 4 | (2) 2 : 1 |
| (3) 4 : 1 | (4) 3 : 1 |

10. A solid cylinder and a hollow cylinder of same mass and radius are released together from the top of an incline. Which reaches the bottom first?

- | | |
|---------------------|------------------------------|
| (1) Hollow cylinder | (2) Solid cylinder |
| (3) Both together | (4) Depends on incline angle |

11. Two particles of masses 2 kg and 3 kg are placed at $x = 0$ and $x = 5 \text{ m}$. The centre of mass lies at

- | | |
|-----------|-----------|
| (1) 2.0 m | (2) 2.5 m |
| (3) 3.0 m | (4) 3.5 m |

12. The weight of a body at a depth $R/2$ below the earth's surface ($R =$ radius of earth) is

- | | |
|-----------|-----------|
| (1) $W/4$ | (2) $W/2$ |
| (3) $2W$ | (4) W |

13. If the radius of a satellite's circular orbit is increased four times, its period of revolution becomes

- | | |
|----------|-----------|
| (1) $2T$ | (2) $4T$ |
| (3) $8T$ | (4) $16T$ |

14. A wire of length L and area A elongates by x under a force F . Another wire of the same material with length $2L$ and area $2A$ under the same force elongates by

- | | |
|-----------|----------|
| (1) $x/2$ | (2) x |
| (3) $2x$ | (4) $4x$ |

15. The excess pressure inside a soap bubble of radius r and surface tension T is

- | | |
|------------|------------|
| (1) T/r | (2) $2T/r$ |
| (3) $4T/r$ | (4) $T/2r$ |

16. Two rods of equal length and cross-section but of conductivities K_1 and K_2 are joined in series. The equivalent conductivity is

- | | |
|------------------------------|-----------------------------|
| (1) $(K_1 + K_2)/2$ | (2) $K_1 K_2 / (K_1 + K_2)$ |
| (3) $2K_1 K_2 / (K_1 + K_2)$ | (4) $\sqrt{K_1 K_2}$ |

17. During an adiabatic expansion of an ideal gas

- | |
|---|
| (1) $Q = 0$ and internal energy decreases |
| (2) $Q = 0$ and temperature rises |
| (3) $W = 0$ and Q is positive |
| (4) $\Delta U = 0$ and $Q = W$ |

- 18.** A Carnot engine working between a source and a sink at 300 K has an efficiency of 50%. The source temperature is
 (1) 450 K (2) 500 K
 (3) 600 K (4) 900 K
- 19.** The ratio of rms speeds of hydrogen and oxygen molecules at the same temperature is
 (1) 1 : 4 (2) 4 : 1
 (3) 1 : 16 (4) 16 : 1
- 20.** In SHM of amplitude A, the kinetic energy equals the potential energy at displacement
 (1) A/4 (2) A/2
 (3) A/√2 (4) A
- 21.** A spring of force constant k is cut into two equal halves and both are used in parallel to oscillate the same mass. The new time period is
 (1) 2T (2) T
 (3) T/2 (4) T/4
- 22.** The ratio of the fundamental frequency of a closed organ pipe to that of an open organ pipe of the same length is
 (1) 1 : 2 (2) 2 : 1
 (3) 1 : 4 (4) 4 : 1
- 23.** A source of sound of frequency f approaches a stationary observer with speed v/5 (v = speed of sound). The apparent frequency is
 (1) 0.8 f (2) 1.20 f
 (3) 1.25 f (4) 1.5 f
- 24.** The electric field at a point inside a charged conducting sphere in electrostatic equilibrium is
 (1) Zero (2) kq/r^2
 (3) kq/R^2 (4) Infinite
- 25.** The work done in rotating an electric dipole of moment p from a position parallel to a uniform field E to a position antiparallel to it is
 (1) Zero (2) pE
 (3) 2pE (4) pE/2
- 26.** A charge q is placed at the centre of a cube. The electric flux through one face of the cube is
 (1) q/ϵ_0 (2) $q/2\epsilon_0$
 (3) $q/6\epsilon_0$ (4) $q/8\epsilon_0$
- 27.** A parallel plate capacitor is charged and then disconnected from the battery. A dielectric of constant K is now inserted. The potential difference becomes
 (1) KV (2) V/K
 (3) V (4) K^2V
- 28.** The radius of a current-carrying wire is doubled while the current is kept the same. The drift velocity of electrons becomes
 (1) Twice (2) Half
 (3) One-fourth (4) Unchanged
- 29.** A cell of emf 12 V delivers a current of 2 A to an external circuit; the terminal voltage is 10 V. The internal resistance is
 (1) 0.5 Ω (2) 1 Ω
 (3) 2 Ω (4) 5 Ω
- 30.** A wire of fixed length is bent into a circular coil of n turns and carries a current I. The magnetic field at the centre is proportional to
 (1) n (2) n^2
 (3) 1/n (4) n^3
- 31.** Two long parallel wires 1 m apart each carry 1 A in the same direction. The force per unit length between them is
 (1) $2 \times 10^{-7} \text{ N m}^{-1}$, attractive
 (2) $2 \times 10^{-7} \text{ N m}^{-1}$, repulsive
 (3) $4\pi \times 10^{-7} \text{ N m}^{-1}$, attractive
 (4) 10^{-7} N m^{-1} , repulsive
- 32.** For a diamagnetic material, the magnetic susceptibility is
 (1) Small and positive (2) Large and positive
 (3) Small and negative (4) Zero
- 33.** A conducting rod of length 0.2 m moves with 10 m s^{-1} perpendicular to a uniform field of 0.5 T. The emf induced is
 (1) 0.1 V (2) 0.5 V
 (3) 1 V (4) 2 V
- 34.** If the number of turns per unit length of a solenoid is doubled keeping length and area the same, its self-inductance becomes
 (1) Half (2) Twice
 (3) Four times (4) Unchanged
- 35.** At resonance in a series LCR circuit
 (1) Impedance is maximum (2) Current is minimum
 (3) Power factor is unity (4) Voltage across R is zero

- 36.** A transformer converts 220 V to 22 V. If the primary has 100 turns, the secondary has
 (1) 5 turns (2) 10 turns
 (3) 100 turns (4) 1000 turns
- 37.** For an electromagnetic wave travelling in free space, the ratio E_0/B_0 equals
 (1) c (2) $1/c$
 (3) c^2 (4) $\mu_0\epsilon_0$
- 38.** A convex lens of focal length 10 cm is placed in contact with a concave lens of focal length 20 cm. The focal length of the combination is
 (1) 10 cm (2) 20 cm
 (3) -20 cm (4) 6.7 cm
- 39.** The critical angle for a medium of refractive index 1.5 with respect to air is nearly
 (1) 30° (2) 42°
 (3) 48° (4) 60°
- 40.** A Young's double slit apparatus giving fringe width β in air is completely immersed in water ($\mu = 4/3$). The new fringe width is
 (1) $4\beta/3$ (2) $3\beta/4$
 (3) β (4) $\beta/2$
- 41.** The energy of the electron in the second orbit of the hydrogen atom is
 (1) -13.6 eV (2) -6.8 eV
 (3) -3.4 eV (4) -1.51 eV
- 42.** In a photoelectric experiment, the graph of stopping potential against frequency of incident light is a straight line whose slope equals
 (1) h (2) h/e
 (3) e/h (4) $h\nu_0$
- 43.** Among the following, the nucleus with the highest binding energy per nucleon is
 (1) ${}^2\text{H}$ (2) ${}^{56}\text{Fe}$
 (3) ${}^{238}\text{U}$ (4) ${}^4\text{He}$
- 44.** When a p-n junction diode is forward biased, the width of the depletion region
 (1) Increases (2) Decreases
 (3) Remains the same (4) Becomes infinite
- 45.** A two-input NAND gate with both inputs shorted together behaves as
 (1) An OR gate (2) An AND gate
 (3) A NOT gate (4) An XOR gate

CHEMISTRY

46. The number of molecules present in 4.4 g of CO_2 is

- (1) 6.022×10^{23} (2) 6.022×10^{22}
(3) 3.011×10^{23} (4) 1.204×10^{23}

47. A compound contains 40% C, 6.7% H and 53.3% O by mass. Its empirical formula is

- (1) CHO (2) CH_2O
(3) $\text{C}_2\text{H}_4\text{O}$ (4) CH_4O

48. The number of unpaired electrons in a chromium atom ($Z = 24$) in its ground state is

- (1) 1 (2) 4
(3) 5 (4) 6

49. The maximum number of electrons that can be accommodated in the sub-shell with $n = 3, l = 2$ is

- (1) 2 (2) 6
(3) 10 (4) 14

50. The correct order of increasing ionic radii is

- (1) $\text{Al}^{3+} < \text{Mg}^{2+} < \text{Na}^+ < \text{F}^- < \text{O}^{2-}$
(2) $\text{O}^{2-} < \text{F}^- < \text{Na}^+ < \text{Mg}^{2+} < \text{Al}^{3+}$
(3) $\text{Na}^+ < \text{Mg}^{2+} < \text{Al}^{3+} < \text{F}^- < \text{O}^{2-}$
(4) $\text{F}^- < \text{O}^{2-} < \text{Na}^+ < \text{Al}^{3+} < \text{Mg}^{2+}$

51. Which of the following has the highest first ionisation enthalpy?

- (1) N (2) O
(3) F (4) Ne

52. Which of the following molecules has zero dipole moment?

- (1) NH_3 (2) H_2O
(3) BF_3 (4) NF_3

53. The bond order of the superoxide ion O_2^- is

- (1) 1 (2) 1.5
(3) 2 (4) 2.5

54. Which of the following species is paramagnetic?

- (1) N_2 (2) O_2
(3) F_2 (4) CO

55. The number of sigma and pi bonds in vinyl acetylene, $\text{CH}\equiv\text{C}-\text{CH}=\text{CH}_2$, is

- (1) 7 σ and 3 π (2) 9 σ and 3 π
(3) 7 σ and 2 π (4) 6 σ and 4 π

56. For the reaction $\text{N}_2(\text{g}) + 3\text{H}_2(\text{g}) \rightarrow 2\text{NH}_3(\text{g})$, the relation between ΔH and ΔU is

- (1) $\Delta H = \Delta U$ (2) $\Delta H = \Delta U + 2RT$
(3) $\Delta H = \Delta U - 2RT$ (4) $\Delta H = \Delta U - RT$

57. A reaction is spontaneous at all temperatures when

- (1) $\Delta H > 0, \Delta S > 0$ (2) $\Delta H < 0, \Delta S > 0$
(3) $\Delta H < 0, \Delta S < 0$ (4) $\Delta H > 0, \Delta S < 0$

58. For $\text{N}_2(\text{g}) + 3\text{H}_2(\text{g}) \rightleftharpoons 2\text{NH}_3(\text{g})$, the relation between K_p and K_c is

- (1) $K_p = K_c$ (2) $K_p = K_c(RT)^2$
(3) $K_p = K_c(RT)^{-2}$ (4) $K_p = K_c(RT)^{-1}$

59. The pH of a 10^{-3} M NaOH solution at 298 K is

- (1) 3 (2) 7
(3) 11 (4) 14

60. In a buffer solution containing equal concentrations of a weak acid and its conjugate base, the pH equals

- (1) pKa (2) pKb
(3) 7 (4) $\text{pKa} + 1$

61. The oxidation number of chromium in $\text{K}_2\text{Cr}_2\text{O}_7$ is

- (1) +3 (2) +4
(3) +6 (4) +7

62. The most stable carbocation among the following is

- (1) CH_3CH_2^+ (2) $(\text{CH}_3)_2\text{CH}^+$
(3) $(\text{CH}_3)_3\text{C}^+$ (4) $\text{C}_6\text{H}_5\text{CH}_2^+$

63. The number of hyperconjugative structures possible for propene is

- (1) 1 (2) 2
(3) 3 (4) 6

64. The IUPAC name of $(\text{CH}_3)_2\text{CH}-\text{CH}_2-\text{CH}(\text{CH}_3)-\text{CH}_3$ is

- (1) 2,4-Dimethylpentane (2) 2,3-Dimethylpentane
(3) 2-Methylhexane (4) 3,4-Dimethylpentane

- 65.** Addition of HBr to propene in the absence of peroxide gives mainly
 (1) 1-Bromopropane (2) 2-Bromopropane
 (3) 1,2-Dibromopropane (4) Propane
- 66.** Reductive ozonolysis of but-2-ene yields
 (1) Ethanal only (2) Methanal only
 (3) Ethanal and methanal (4) Propanone
- 67.** The electrophile involved in the nitration of benzene is
 (1) NO_2^- (2) NO_2^+
 (3) NO^+ (4) HNO_3
- 68.** The van't Hoff factor for $\text{K}_4[\text{Fe}(\text{CN})_6]$, assuming complete dissociation, is
 (1) 2 (2) 3
 (3) 4 (4) 5
- 69.** Which of the following aqueous solutions has the highest boiling point (assume complete dissociation)?
 (1) 0.1 m glucose (2) 0.1 m NaCl
 (3) 0.1 m BaCl_2 (4) 0.1 m urea
- 70.** Given $E^\circ(\text{Zn}^{2+}/\text{Zn}) = -0.76 \text{ V}$ and $E^\circ(\text{Cu}^{2+}/\text{Cu}) = +0.34 \text{ V}$, the standard emf of the Daniell cell is
 (1) 0.42 V (2) 1.10 V
 (3) -1.10 V (4) 0.76 V
- 71.** The mass of copper deposited when 2 faradays of charge are passed through CuSO_4 solution is (At. mass Cu = 63.5)
 (1) 31.75 g (2) 63.5 g
 (3) 127 g (4) 15.9 g
- 72.** On dilution of a weak electrolyte solution
 (1) Molar conductivity decreases and conductivity increases
 (2) Both molar conductivity and conductivity increase
 (3) Molar conductivity increases and conductivity decreases
 (4) Both decrease
- 73.** For a first-order reaction with $k = 6.93 \times 10^{-3} \text{ s}^{-1}$, the half-life is
 (1) 10 s (2) 100 s
 (3) 693 s (4) 1000 s
- 74.** For a first-order reaction, the time required for 99% completion is
 (1) Equal to the time for 90% completion
 (2) Twice the time for 90% completion
 (3) Half the time for 90% completion
 (4) Ten times the time for 90% completion
- 75.** Which of the following ions is colourless in aqueous solution?
 (1) Ti^{3+} (2) Cu^{2+}
 (3) Sc^{3+} (4) Ni^{2+}
- 76.** Lanthanoid contraction is primarily due to
 (1) Perfect shielding by 4f electrons
 (2) Poor shielding by 4f electrons
 (3) Increasing atomic size across the series
 (4) Presence of unpaired 5d electrons
- 77.** The spin-only magnetic moment of Fe^{3+} is
 (1) 1.73 BM (2) 3.87 BM
 (3) 4.90 BM (4) 5.92 BM
- 78.** The IUPAC name of $[\text{Co}(\text{NH}_3)_5\text{Cl}]\text{Cl}_2$ is
 (1) Pentaamminechloridocobalt(III) chloride
 (2) Pentaamminechlorocobalt(II) chloride
 (3) Chloridopentaamminecobalt(II) chloride
 (4) Pentaamminechloridocobalt(II) dichloride
- 79.** The hybridisation and number of unpaired electrons in $[\text{Fe}(\text{CN})_6]^{3-}$ are
 (1) sp^3d^2 , 5 (2) d^2sp^3 , 1
 (3) sp^3d^2 , 1 (4) d^2sp^3 , 5
- 80.** The number of geometrical isomers of $[\text{Co}(\text{NH}_3)_4\text{Cl}_2]^+$ is
 (1) 1 (2) 2
 (3) 3 (4) 4
- 81.** The correct order of reactivity towards $\text{S}_\text{N}1$ reaction is
 (1) $1^\circ > 2^\circ > 3^\circ$ (2) $3^\circ > 2^\circ > 1^\circ$
 (3) $2^\circ > 3^\circ > 1^\circ$ (4) $1^\circ > 3^\circ > 2^\circ$
- 82.** Which halide undergoes $\text{S}_\text{N}2$ substitution most rapidly?
 (1) CH_3Br (2) $\text{CH}_3\text{CH}_2\text{Br}$
 (3) $(\text{CH}_3)_2\text{CHBr}$ (4) $(\text{CH}_3)_3\text{CBr}$

83. The correct order of acidic strength is

- (1) Ethanol > water > phenol
(3) Water > phenol > ethanol

- (2) Phenol > water > ethanol
(4) Phenol > ethanol > water

84. In the Lucas test, the alcohol that gives immediate turbidity at room temperature is

- (1) Ethanol
(3) Propan-2-ol

- (2) Propan-1-ol
(4) 2-Methylpropan-2-ol

85. Which of the following does NOT undergo the aldol condensation?

- (1) Ethanal
(3) Benzaldehyde

- (2) Propanone
(4) Butanal

86. Which compound does NOT give a positive iodoform test?

- (1) Ethanol
(3) Ethanal

- (2) Propanone
(4) Pentan-3-one

87. The correct order of acid strength is

- (1) $\text{CH}_3\text{COOH} > \text{ClCH}_2\text{COOH} > \text{FCH}_2\text{COOH}$
(2) $\text{FCH}_2\text{COOH} > \text{ClCH}_2\text{COOH} > \text{CH}_3\text{COOH}$
(3) $\text{ClCH}_2\text{COOH} > \text{FCH}_2\text{COOH} > \text{CH}_3\text{COOH}$
(4) $\text{CH}_3\text{COOH} > \text{FCH}_2\text{COOH} > \text{ClCH}_2\text{COOH}$

88. The correct order of basic strength in aqueous solution is

- (1) $\text{NH}_3 > \text{C}_2\text{H}_5\text{NH}_2 > (\text{C}_2\text{H}_5)_2\text{NH}$
(2) $(\text{C}_2\text{H}_5)_2\text{NH} > \text{C}_2\text{H}_5\text{NH}_2 > \text{NH}_3 > \text{C}_6\text{H}_5\text{NH}_2$
(3) $\text{C}_6\text{H}_5\text{NH}_2 > \text{NH}_3 > \text{C}_2\text{H}_5\text{NH}_2$
(4) $(\text{C}_2\text{H}_5)_3\text{N} > (\text{C}_2\text{H}_5)_2\text{NH} > \text{C}_2\text{H}_5\text{NH}_2 > \text{NH}_3$

89. The carbylamine reaction is a test for

- (1) Primary amines
(3) Tertiary amines

- (2) Secondary amines
(4) Quaternary salts

90. Which of the following is a non-reducing sugar?

- (1) Glucose
(3) Lactose

- (2) Maltose
(4) Sucrose

BOTANY

- 91.** In the name *Mangifera indica*, the word 'indica' represents the
(1) Genus (2) Specific epithet
(3) Family (4) Order
- 92.** The organism that completely lacks a cell wall and is the smallest living cell is
(1) Cyanobacteria (2) Mycoplasma
(3) Nostoc (4) Chlamydomonas
- 93.** Red tides in the sea are caused by
(1) Diatoms (2) Dinoflagellates
(3) Euglenoids (4) Slime moulds
- 94.** The dikaryotic condition ($n + n$) is a characteristic feature of
(1) Phycomycetes
(2) Ascomycetes and Basidiomycetes
(3) Deuteromycetes only
(4) Basidiomycetes only
- 95.** The prothallus of a fern is
(1) A diploid sporophyte (2) A haploid gametophyte
(3) A resting spore (4) A protonema
- 96.** Double fertilisation is a characteristic feature of
(1) Bryophytes (2) Pteridophytes
(3) Gymnosperms (4) Angiosperms
- 97.** The type of aestivation seen in china rose (*Hibiscus*) is
(1) Valvate (2) Twisted
(3) Imbricate (4) Vexillary
- 98.** Free central placentation is found in
(1) Pea (2) Dianthus
(3) China rose (4) Mustard
- 99.** Vexillary aestivation together with diadelphous stamens is characteristic of the family
(1) Solanaceae (2) Liliaceae
(3) Fabaceae (4) Brassicaceae
- 100.** Casparian strips are a characteristic feature of
(1) Epidermis (2) Cortex
(3) Endodermis (4) Pericycle
- 101.** Vascular bundles in a monocot stem are
(1) Conjoint, open and arranged in a ring
(2) Conjoint, closed and scattered
(3) Radial and closed
(4) Bicollateral and open
- 102.** Bulliform cells occur in the
(1) Root epidermis of dicots
(2) Adaxial epidermis of grass leaves
(3) Pericycle of monocot roots
(4) Phloem of dicot stems
- 103.** The prokaryotic ribosome is
(1) 80S with 60S and 40S subunits
(2) 70S with 50S and 30S subunits
(3) 70S with 60S and 30S subunits
(4) 80S with 50S and 40S subunits
- 104.** The middle lamella between adjacent plant cells is mainly composed of
(1) Cellulose (2) Lignin
(3) Calcium pectate (4) Suberin
- 105.** Which of the following cell organelles is non-membranous?
(1) Lysosome (2) Ribosome
(3) Golgi apparatus (4) Peroxisome
- 106.** Malonate inhibits succinic dehydrogenase because it is a
(1) Non-competitive inhibitor (2) Competitive inhibitor
(3) Allosteric activator (4) Coenzyme
- 107.** Which of the following is a secondary metabolite?
(1) Glycine (2) Rubber
(3) Glucose (4) Cholesterol

- 108.** Crossing over between homologous chromosomes takes place during
 (1) Leptotene (2) Zygotene
 (3) Pachytene (4) Diplotene
- 109.** The synaptonemal complex is formed during
 (1) Leptotene (2) Zygotene
 (3) Diakinesis (4) Metaphase I
- 110.** In C_4 plants the first stable product of CO_2 fixation is
 (1) 3-Phosphoglyceric acid (2) Oxaloacetic acid
 (3) Malic acid (4) Pyruvic acid
- 111.** The number of ATP and NADPH molecules required to fix six molecules of CO_2 in the Calvin cycle is
 (1) 12 ATP and 12 NADPH (2) 18 ATP and 12 NADPH
 (3) 12 ATP and 18 NADPH (4) 18 ATP and 18 NADPH
- 112.** During photorespiration
 (1) ATP and NADPH are produced
 (2) Sugar is synthesised
 (3) There is no synthesis of sugar or ATP
 (4) Only NADPH is produced
- 113.** The reaction centre pigment of photosystem I is
 (1) P680 (2) P700
 (3) P870 (4) Chlorophyll b
- 114.** The net gain of ATP molecules from the complete aerobic oxidation of one molecule of glucose, as given in NCERT, is
 (1) 30 (2) 32
 (3) 36 (4) 38
- 115.** The respiratory quotient of fats is
 (1) Greater than 1 (2) Equal to 1
 (3) Less than 1 (4) Zero
- 116.** Parthenocarpy in tomato can be induced by treatment with
 (1) Auxin (2) Absciscic acid
 (3) Ethylene (4) Cytokinin
- 117.** The promotion of flowering by a period of low temperature is called
 (1) Photoperiodism (2) Vernalisation
 (3) Phototropism (4) Senescence
- 118.** The innermost wall layer of the anther that nourishes developing pollen grains is the
 (1) Epidermis (2) Endothecium
 (3) Middle layer (4) Tapetum
- 119.** A typical Polygonum type embryo sac at maturity is
 (1) 8-nucleate and 8-celled (2) 8-nucleate and 7-celled
 (3) 7-nucleate and 8-celled (4) 4-nucleate and 4-celled
- 120.** The primary endosperm nucleus in angiosperms is
 (1) Haploid (2) Diploid
 (3) Triploid (4) Tetraploid
- 121.** Polyembryony in citrus commonly results from
 (1) Cleavage of the zygote
 (2) Nucellar cells developing into embryos
 (3) Fusion of two egg cells
 (4) Division of the synergid only
- 122.** The phenotypic ratio obtained in a dihybrid test cross is
 (1) 9 : 3 : 3 : 1 (2) 1 : 2 : 1
 (3) 1 : 1 : 1 : 1 (4) 3 : 1
- 123.** The ABO blood group system in humans illustrates
 (1) Only codominance
 (2) Only multiple allelism
 (3) Multiple allelism and codominance
 (4) Incomplete dominance
- 124.** A carrier woman for colour blindness marries a normal man. The probability that their sons are colour blind is
 (1) 0% (2) 25%
 (3) 50% (4) 100%
- 125.** Down's syndrome is caused by
 (1) Monosomy of chromosome 21 (2) Trisomy of chromosome 21
 (3) Trisomy of chromosome 18 (4) An extra X chromosome

- 126.** The transforming principle of Griffith's experiment was identified as DNA by
(1) Hershey and Chase (2) Avery, MacLeod and McCarty
(3) Meselson and Stahl (4) Watson and Crick
- 127.** Okazaki fragments are formed on the lagging strand and are joined together by
(1) DNA helicase (2) DNA ligase
(3) DNA polymerase III (4) Primase
- 128.** The inducer of the lac operon in *E. coli* is
(1) Lactose itself (2) Allolactose
(3) Galactose (4) cAMP
- 129.** The approximate number of base pairs in the human genome is
(1) 3.3×10^6 (2) 3.3×10^9
(3) 6.6×10^9 (4) 3.3×10^{12}
- 130.** The logistic growth curve is
(1) J-shaped (2) Sigmoid
(3) Linear (4) Exponential throughout
- 131.** Lichens represent an example of
(1) Parasitism (2) Commensalism
(3) Mutualism (4) Amensalism
- 132.** The pyramid of energy in an ecosystem is
(1) Always inverted (2) Always upright
(3) Sometimes inverted (4) Always spindle shaped
- 133.** Net primary productivity is equal to
(1) GPP + respiration losses
(2) GPP – respiration losses
(3) Secondary productivity + GPP
(4) Standing crop
- 134.** In the species–area relationship $S = CA^Z$, the value of Z for small regions usually lies between
(1) 0.1 and 0.2 (2) 0.6 and 1.2
(3) 1.0 and 1.5 (4) 0.01 and 0.05
- 135.** Sacred groves are an example of
(1) Ex situ conservation (2) In situ conservation
(3) Cryopreservation (4) Seed bank conservation

ZOOLOGY

136. The water vascular system is a characteristic feature of the phylum

- | | |
|-------------------|----------------|
| (1) Mollusca | (2) Arthropoda |
| (3) Echinodermata | (4) Annelida |

137. Flame cells are the excretory structures of

- | | |
|---------------------|-------------------|
| (1) Platyhelminthes | (2) Aschelminthes |
| (3) Annelida | (4) Porifera |

138. An open circulatory system is characteristic of

- | | |
|--------------|-------------------|
| (1) Annelida | (2) Arthropoda |
| (3) Chordata | (4) Echinodermata |

139. The notochord persists throughout life along the entire length of the body in

- | | |
|-----------------|---------------------|
| (1) Urochordata | (2) Cephalochordata |
| (3) Vertebrata | (4) Hemichordata |

140. Areolar tissue is a type of

- (1) Dense regular connective tissue
- (2) Loose connective tissue
- (3) Specialised connective tissue
- (4) Epithelial tissue

141. The excretory structures of cockroach are

- | | |
|------------------|------------------------|
| (1) Green glands | (2) Malpighian tubules |
| (3) Nephridia | (4) Flame cells |

142. The oxygen dissociation curve of haemoglobin shifts to the right when

- | | |
|------------------------------|--|
| (1) $p\text{CO}_2$ decreases | (2) pH increases |
| (3) Temperature falls | (4) $p\text{CO}_2$ and H^+ increase |

143. The percentage of carbon dioxide transported in blood as bicarbonate is about

- | | |
|---------|------------|
| (1) 7% | (2) 20–25% |
| (3) 70% | (4) 97% |

144. Vital capacity is equal to

- | | |
|-------------------------|--------------------|
| (1) TV + IRV | (2) TV + IRV + ERV |
| (3) TV + IRV + ERV + RV | (4) IRV + ERV |

145. The pacemaker of the human heart is the

- | | |
|-------------------|---------------------|
| (1) AV node | (2) SA node |
| (3) Bundle of His | (4) Purkinje fibres |

146. During blood clotting, thrombin converts

- | | |
|-----------------------------|--------------------------------|
| (1) Prothrombin to thrombin | (2) Fibrinogen to fibrin |
| (3) Fibrin to fibrinogen | (4) Prothrombinase to thrombin |

147. The first heart sound 'lubb' is produced by the closure of

- | | |
|-----------------------------|--------------------------|
| (1) Semilunar valves | (2) Tricuspid valve only |
| (3) Atrioventricular valves | (4) Aortic valve only |

148. Maximum reabsorption of glucose, amino acids and Na^+ occurs in the

- | | |
|--------------------------------|---------------------|
| (1) Proximal convoluted tubule | (2) Loop of Henle |
| (3) Distal convoluted tubule | (4) Collecting duct |

149. Antidiuretic hormone acts mainly on the

- (1) Glomerulus
- (2) Proximal tubule
- (3) Distal tubule and collecting duct
- (4) Vasa recta

150. Birds and reptiles are

- | | |
|-----------------|----------------|
| (1) Ammonotelic | (2) Ureotelic |
| (3) Uricotelic | (4) Aminotelic |

151. During muscle contraction according to the sliding filament theory

- | | |
|--------------------------------|----------------------------|
| (1) The A band shortens | (2) The I band shortens |
| (3) Both A and I bands shorten | (4) Only the A band widens |

152. The total number of bones in the human axial skeleton is

- | | |
|---------|---------|
| (1) 80 | (2) 126 |
| (3) 206 | (4) 32 |

153. Gout is caused by the accumulation in joints of

- | | |
|-------------------|------------------------|
| (1) Calcium salts | (2) Uric acid crystals |
| (3) Lactic acid | (4) Creatinine |

154. The resting membrane potential of a neuron is maintained mainly by

- (1) Voltage-gated Ca^{2+} channels
- (2) The Na^+/K^+ pump moving 3 Na^+ out and 2 K^+ in
- (3) Passive influx of Na^+
- (4) Chloride pumps

155. Saltatory conduction of a nerve impulse occurs

- (1) In unmyelinated axons
- (2) From one node of Ranvier to the next
- (3) Only across synapses
- (4) In dendrites only

156. The part of the brain responsible for maintaining posture and balance is the

- (1) Cerebrum
- (2) Cerebellum
- (3) Medulla oblongata
- (4) Hypothalamus

157. Insulin is secreted by

- (1) Alpha cells of islets of Langerhans
- (2) Beta cells of islets of Langerhans
- (3) Acinar cells of the pancreas
- (4) Delta cells

158. Oxytocin and vasopressin are

- (1) Synthesised by the anterior pituitary
- (2) Synthesised by the hypothalamus and released from the posterior pituitary
- (3) Secreted by the pineal gland
- (4) Secreted by the adrenal medulla

159. Addison's disease results from

- (1) Hypersecretion of the adrenal cortex
- (2) Hyposecretion of the adrenal cortex
- (3) Hypersecretion of the thyroid
- (4) Hyposecretion of the pancreas

160. Sertoli cells of the seminiferous tubules

- (1) Secrete testosterone
- (2) Provide nutrition to germ cells
- (3) Produce sperms directly
- (4) Secrete LH

161. Fertilisation in humans normally occurs in the

- (1) Uterus
- (2) Cervix
- (3) Ampullary-isthmic junction of the fallopian tube
- (4) Ovary

162. The corpus luteum is maintained during early pregnancy by

- (1) FSH
- (2) LH only
- (3) Human chorionic gonadotropin
- (4) Relaxin

163. The approximate number of primary oocytes present in each ovary at birth is

- (1) 400
- (2) 4000
- (3) 1-2 million
- (4) 60,000

164. Copper-releasing IUDs act mainly by

- (1) Preventing ovulation
- (2) Suppressing sperm motility and fertilising capacity
- (3) Blocking implantation only
- (4) Altering the menstrual cycle length

165. Medical termination of pregnancy is considered relatively safe up to

- (1) 6 weeks
- (2) 12 weeks
- (3) 20 weeks
- (4) 24 weeks

166. In the technique ZIFT, what is transferred into the fallopian tube?

- (1) An ovum
- (2) Sperm only
- (3) A zygote or early embryo up to the 8-blastomere stage
- (4) A blastocyst

167. Industrial melanism in *Biston betularia* is a classic demonstration of

- (1) Genetic drift
- (2) Natural selection
- (3) Mutation pressure
- (4) Founder effect

168. In a population in Hardy-Weinberg equilibrium, the frequency of the recessive allele is 0.4. The frequency of heterozygotes is

- (1) 0.16
- (2) 0.36
- (3) 0.48
- (4) 0.24

169. The wings of a butterfly and the wings of a bird are

- (1) Homologous and show divergent evolution
- (2) Analogous and show convergent evolution
- (3) Vestigial structures
- (4) Homologous and show convergent evolution

170. The approximate cranial capacity of *Homo habilis* was

- (1) 450 cc
- (2) 650–800 cc
- (3) 900 cc
- (4) 1400 cc

171. The recurring chill and high fever in malaria is caused by the release of

- (1) Sporozoites
- (2) Haemozoin
- (3) Merozoites into the liver
- (4) Gametocytes

172. Which of the following diseases is caused by a virus?

- (1) Typhoid
- (2) Dengue
- (3) Malaria
- (4) Ringworm

173. The basic structure of an antibody molecule is represented as

- (1) H_4L_2
- (2) H_2L_2
- (3) H_2L_4
- (4) HL

174. HIV primarily attacks

- (1) B lymphocytes
- (2) Helper T lymphocytes
- (3) Erythrocytes
- (4) Neutrophils

175. The restriction enzyme *EcoRI* recognises the palindromic sequence

- (1) GGATCC
- (2) GAATTC
- (3) AAGCTT
- (4) CTGCAG

176. The enzyme used in PCR that withstands high temperature is

- (1) DNA ligase
- (2) Taq polymerase
- (3) Restriction endonuclease
- (4) Reverse transcriptase

177. In a cloning vector, the 'ori' sequence

- (1) Allows selection of transformants
- (2) Controls the copy number of the linked DNA
- (3) Codes for antibiotic resistance
- (4) Cuts DNA at specific sites

178. The Bt toxin protein exists as an inactive protoxin and becomes active

- (1) In the acidic stomach of vertebrates
- (2) In the alkaline gut of the insect
- (3) On exposure to sunlight
- (4) Inside the bacterial cell

179. RNA interference has been used in tobacco plants to provide resistance against

- (1) *Helicoverpa armigera*
- (2) *Meloidogyne incognita*
- (3) *Bacillus thuringiensis*
- (4) *Agrobacterium tumefaciens*

180. The first clinical gene therapy was given in 1990 to a girl suffering from

- (1) Cystic fibrosis
- (2) Adenosine deaminase deficiency
- (3) Sickle cell anaemia
- (4) Haemophilia

ANSWER RECORDING SHEET

Write 1, 2, 3 or 4 against each question number. Leave blank if not attempted. Score: (correct $\times$ 4) – (wrong $\times$ 1).

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60

61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120

121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140
141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160
161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180

<i>SPACE FOR ROUGH WORK</i>
