

NEET (UG) – 2027 PRACTICE EXAMINATION MOST-EXPECTED FULL SYLLABUS TEST BOOKLET			SET 2
--	--	--	--------------

Candidate	Aamirah Fathima	Test Booklet Set	2
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. Which of the following pairs has the same dimensional formula?

- | | |
|------------------------|------------------------|
| (1) Work and power | (2) Torque and work |
| (3) Force and momentum | (4) Impulse and energy |

2. The number of significant figures in 0.00250 is

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

3. A body starting from rest moves with uniform acceleration. The distances covered in the 1st, 2nd and 3rd seconds are in the ratio

- | | |
|---------------|---------------|
| (1) 1 : 2 : 3 | (2) 1 : 3 : 5 |
| (3) 1 : 4 : 9 | (4) 1 : 1 : 1 |

4. A body is dropped from rest and reaches the ground in 4 s. The distance it covers during the last second of its fall is ($g = 10 \text{ m s}^{-2}$)

- | | |
|----------|----------|
| (1) 5 m | (2) 20 m |
| (3) 35 m | (4) 80 m |

5. A ball of mass 0.15 kg strikes a wall normally at 20 m s^{-1} and rebounds with the same speed. The impulse imparted to the ball is

- | | |
|-----------|------------|
| (1) Zero | (2) 3 N s |
| (3) 6 N s | (4) 30 N s |

6. Two blocks of 3 kg and 2 kg, connected by a light string, rest on a smooth surface. A force of 10 N pulls the 3 kg block. The tension in the string is

- | | |
|---------|----------|
| (1) 2 N | (2) 4 N |
| (3) 6 N | (4) 10 N |

7. A bullet of mass 10 g moving at 400 m s^{-1} penetrates 20 cm into a wooden block. The average retarding force is

- | | |
|------------|------------|
| (1) 400 N | (2) 2000 N |
| (3) 4000 N | (4) 8000 N |

8. A torque of 4 N m acts on a body of moment of inertia 2 kg m^2 . The angular acceleration produced is

- | | |
|------------------------------|----------------------------|
| (1) 0.5 rad s^{-2} | (2) 2 rad s^{-2} |
| (3) 4 rad s^{-2} | (4) 8 rad s^{-2} |

9. The radius of gyration of a solid sphere of radius R about its diameter is

- | | |
|----------------------|----------------------|
| (1) R | (2) $\sqrt{(2/5)} R$ |
| (3) $\sqrt{(2/3)} R$ | (4) $R/2$ |

10. A ballet dancer spinning on her toes folds her arms inwards. As a result

- | | |
|--------------------------------|--------------------------------|
| (1) Angular velocity decreases | (2) Angular momentum increases |
| (3) Angular velocity increases | (4) Kinetic energy decreases |

11. The escape velocity from the earth is 11.2 km s^{-1} . For a planet of the same density but twice the radius, the escape velocity is

- | | |
|------------------------------|------------------------------|
| (1) 5.6 km s^{-1} | (2) 11.2 km s^{-1} |
| (3) 22.4 km s^{-1} | (4) 44.8 km s^{-1} |

12. Kepler's second law (equal areas in equal times) is a direct consequence of the conservation of

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

13. The elastic potential energy stored per unit volume of a stretched wire is

- | | |
|---|---|
| (1) Stress $\times$ strain | (2) $\frac{1}{2} \times \text{stress} \times \text{strain}$ |
| (3) $2 \times \text{stress} \times \text{strain}$ | (4) Stress/strain |

14. If the radius of a spherical drop falling through a viscous medium is doubled, its terminal velocity becomes

- | | |
|-----------------|----------------|
| (1) Twice | (2) Four times |
| (3) Eight times | (4) Half |

15. If the absolute temperature of a black body is doubled, the energy radiated per unit area per second becomes

- | | |
|-------------|--------------|
| (1) 2 times | (2) 4 times |
| (3) 8 times | (4) 16 times |

16. The work done by n moles of an ideal gas in a reversible isothermal expansion from V_1 to V_2 is

- | | |
|---------------------|------------------------|
| (1) $nR(T_2 - T_1)$ | (2) $nRT \ln(V_2/V_1)$ |
| (3) $P(V_2 - V_1)$ | (4) Zero |

17. In a cyclic process, the change in internal energy of the system is

- | | |
|--------------------------------|---------------------|
| (1) Equal to the work done | (2) Zero |
| (3) Equal to the heat absorbed | (4) Always negative |

18. The average kinetic energy of a gas molecule depends only on

- | | |
|--------------------------|--------------------|
| (1) Pressure | (2) Volume |
| (3) Absolute temperature | (4) Molecular mass |

- 19.** The time period of a simple pendulum in a lift accelerating upwards with acceleration a
 (1) Increases (2) Decreases
 (3) Remains unchanged (4) Becomes infinite
- 20.** For a particle executing SHM, the acceleration is maximum
 (1) At the mean position (2) At the extreme positions
 (3) At half the amplitude (4) Everywhere the same
- 21.** Two tuning forks of frequencies 256 Hz and 260 Hz are sounded together. The number of beats heard per second is
 (1) 2 (2) 4
 (3) 8 (4) 516
- 22.** The tension in a stretched string is increased four times keeping length and mass per unit length constant. Its fundamental frequency becomes
 (1) Half (2) Twice
 (3) Four times (4) Unchanged
- 23.** The force between two charges placed in a medium of dielectric constant K , compared with that in vacuum, is
 (1) K times greater (2) K times smaller
 (3) K^2 times greater (4) Unchanged
- 24.** The work done in moving a charge from one point to another on an equipotential surface is
 (1) qV (2) Zero
 (3) Infinite (4) q^2V
- 25.** Three capacitors of $3\ \mu\text{F}$ each are connected in series. The equivalent capacitance is
 (1) $1\ \mu\text{F}$ (2) $3\ \mu\text{F}$
 (3) $6\ \mu\text{F}$ (4) $9\ \mu\text{F}$
- 26.** With rise in temperature, the resistivity of a semiconductor
 (1) Increases
 (2) Decreases
 (3) Remains constant
 (4) First increases then decreases
- 27.** Two identical cells, each of emf 2 V and internal resistance $1\ \Omega$, are connected in parallel across an external resistance of $2\ \Omega$. The current through the external resistance is
 (1) 0.5 A (2) 0.8 A
 (3) 1.0 A (4) 2.0 A
- 28.** A wire of resistance R is stretched uniformly so that its length becomes double. Its new resistance is
 (1) $R/2$ (2) $2R$
 (3) $4R$ (4) $R/4$
- 29.** A charged particle moving parallel to a uniform magnetic field experiences
 (1) Maximum force
 (2) Zero force
 (3) A force qvB
 (4) A force that reverses its motion
- 30.** For a charged particle moving in a circular path in a uniform magnetic field, the time period is
 (1) Proportional to speed
 (2) Inversely proportional to speed
 (3) Independent of speed
 (4) Proportional to radius squared
- 31.** The torque on a rectangular current loop of N turns and area A in a magnetic field B is maximum when the plane of the loop is
 (1) Perpendicular to B (2) Parallel to B
 (3) At 45° to B (4) Any orientation
- 32.** According to Curie's law, the magnetic susceptibility of a paramagnetic substance
 (1) Is independent of temperature
 (2) Is proportional to temperature
 (3) Is inversely proportional to absolute temperature
 (4) Is always negative
- 33.** Lenz's law is a direct consequence of the conservation of
 (1) Charge (2) Momentum
 (3) Energy (4) Magnetic flux
- 34.** Two coils have a mutual inductance of $0.5\ \text{H}$. If the current in the first coil changes at $20\ \text{A s}^{-1}$, the emf induced in the second coil is
 (1) 1 V (2) 5 V
 (3) 10 V (4) 40 V
- 35.** The peak value of an alternating current is 4 A. Its rms value is
 (1) 2 A (2) 2.83 A
 (3) 4 A (4) 5.66 A

- 36.** In a circuit containing a pure inductor, the average power consumed over a complete cycle is
(1) Maximum (2) Zero
(3) I^2R (4) VI
- 37.** Among the following, the electromagnetic radiation with the longest wavelength is
(1) X-rays (2) Ultraviolet rays
(3) Infrared rays (4) Radio waves
- 38.** An object is placed at the centre of curvature of a concave mirror. The image formed is
(1) Virtual, erect and magnified
(2) Real, inverted and of the same size
(3) Real, inverted and diminished
(4) At infinity
- 39.** A coin lies at the bottom of a tank of water ($\mu = 4/3$) filled to a depth of 12 cm. Its apparent depth is
(1) 6 cm (2) 9 cm
(3) 12 cm (4) 16 cm
- 40.** Sustained interference of light requires that the two sources be
(1) Of different frequencies
(2) Coherent with a constant phase difference
(3) Of equal intensity only
(4) Very far apart
- 41.** In single slit diffraction, the angular width of the central maximum is
(1) λ/a (2) $2\lambda/a$
(3) $\lambda/2a$ (4) a/λ
- 42.** The work function of a metal is 2.0 eV. Its threshold wavelength is nearly
(1) 310 nm (2) 620 nm
(3) 1240 nm (4) 155 nm
- 43.** After three half-lives, the fraction of a radioactive sample that remains undecayed is
(1) $1/3$ (2) $1/6$
(3) $1/8$ (4) $1/9$
- 44.** In the Bohr model of the hydrogen atom, the radius of the third orbit is nearly
(1) $0.53 \text{ \AA}$ (2) $1.59 \text{ \AA}$
(3) $4.77 \text{ \AA}$ (4) $9.54 \text{ \AA}$
- 45.** A Zener diode used as a voltage regulator is always operated in
(1) Forward bias
(2) Reverse bias beyond the breakdown voltage
(3) Unbiased condition
(4) Reverse bias below breakdown

CHEMISTRY

46. The number of moles of oxygen atoms present in 0.5 mole of H_2SO_4 is

- | | |
|---------|---------|
| (1) 0.5 | (2) 1.0 |
| (3) 2.0 | (4) 4.0 |

47. One mole of N_2 reacts with 2 moles of H_2 according to $\text{N}_2 + 3\text{H}_2 \rightarrow 2\text{NH}_3$. The maximum amount of NH_3 formed is

- | | |
|--------------|--------------|
| (1) 1.00 mol | (2) 1.33 mol |
| (3) 2.00 mol | (4) 0.67 mol |

48. The radius of the third Bohr orbit of the hydrogen atom is approximately

- | | |
|-------------|-------------|
| (1) 0.529 Å | (2) 1.587 Å |
| (3) 2.116 Å | (4) 4.761 Å |

49. Which of the following sets of quantum numbers is NOT permissible?

- | | |
|----------------------------|---------------------------|
| (1) $n = 3, l = 2, m = -2$ | (2) $n = 3, l = 0, m = 0$ |
| (3) $n = 3, l = 3, m = +1$ | (4) $n = 2, l = 1, m = 0$ |

50. The element with the most negative electron gain enthalpy is

- | | |
|--------|--------|
| (1) F | (2) Cl |
| (3) Br | (4) I |

51. An element with the outer configuration $[\text{Ne}]3s^23p^3$ belongs to

- | | |
|------------------------|------------------------|
| (1) Group 13, period 3 | (2) Group 15, period 3 |
| (3) Group 5, period 3 | (4) Group 15, period 2 |

52. According to VSEPR theory, the shape of ClF_3 is

- | | |
|---------------------|-----------------|
| (1) Trigonal planar | (2) Pyramidal |
| (3) T-shaped | (4) Tetrahedral |

53. Hydrogen fluoride has an abnormally high boiling point among the hydrogen halides because of

- (1) Its low molecular mass
(2) Intermolecular hydrogen bonding
(3) Its ionic character
(4) van der Waals forces

54. The carbon atoms in ethene are

- | | |
|-----------------------|-----------------------|
| (1) sp hybridised | (2) sp^2 hybridised |
| (3) sp^3 hybridised | (4) Unhybridised |

55. The correct order of bond angles is

- | | |
|--|--|
| (1) $\text{H}_2\text{O} > \text{NH}_3 > \text{BF}_3$ | (2) $\text{BF}_3 > \text{NH}_3 > \text{H}_2\text{O}$ |
| (3) $\text{NH}_3 > \text{BF}_3 > \text{H}_2\text{O}$ | (4) $\text{BF}_3 > \text{H}_2\text{O} > \text{NH}_3$ |

56. The standard enthalpy of formation of an element in its most stable form is

- (1) Always positive
(2) Always negative
(3) Zero
(4) Equal to its atomisation enthalpy

57. Which of the following is an intensive property?

- | | |
|-----------------|---------------------|
| (1) Volume | (2) Enthalpy |
| (3) Temperature | (4) Internal energy |

58. For $\text{N}_2(\text{g}) + 3\text{H}_2(\text{g}) \rightleftharpoons 2\text{NH}_3(\text{g})$, increasing the pressure at constant temperature

- (1) Shifts the equilibrium backward
(2) Shifts the equilibrium forward
(3) Has no effect
(4) Changes the value of K_p

59. The solubility of AgCl in water decreases on adding NaCl . This is called

- | | |
|-------------------|-----------------------|
| (1) Buffer action | (2) Common ion effect |
| (3) Hydrolysis | (4) Salting in |

60. The conjugate base of H_2PO_4^- is

- | | |
|-----------------------------|-------------------------------|
| (1) H_3PO_4 | (2) HPO_4^{2-} |
| (3) PO_4^{3-} | (4) H_2PO_4^- |

61. In the reaction $\text{Cl}_2 + 2\text{NaOH} \rightarrow \text{NaCl} + \text{NaOCl} + \text{H}_2\text{O}$, chlorine undergoes

- (1) Only oxidation
(2) Only reduction
(3) Disproportionation
(4) No change in oxidation state

62. Among the following, the strongest electron-withdrawing group is

- | | |
|--------------------|---------------------|
| (1) $-\text{CH}_3$ | (2) $-\text{OCH}_3$ |
| (3) $-\text{NO}_2$ | (4) $-\text{NH}_2$ |

63. The number of chain isomers of C_5H_{12} is

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

64. The technique used to separate two liquids with a large difference in boiling points is

- | | |
|-------------------------|------------------------|
| (1) Simple distillation | (2) Steam distillation |
| (3) Sublimation | (4) Chromatography |

65. The Wurtz reaction of ethyl bromide with sodium in dry ether gives

- | | |
|--------------|-------------|
| (1) Ethane | (2) Propane |
| (3) n-Butane | (4) Ethene |

66. Which of the following reacts with sodium metal to liberate hydrogen gas?

- | | |
|---------------|---------------|
| (1) Ethane | (2) Ethene |
| (3) But-2-yne | (4) But-1-yne |

67. Friedel-Crafts alkylation does NOT take place with

- | | |
|------------------|-------------------|
| (1) Benzene | (2) Toluene |
| (3) Nitrobenzene | (4) Chlorobenzene |

68. The relative lowering of vapour pressure of a dilute solution is equal to the

- | | |
|------------------------------|------------------------------|
| (1) Mole fraction of solvent | (2) Mole fraction of solute |
| (3) Molality of the solution | (4) Molarity of the solution |

69. Which of the following has the maximum osmotic pressure at the same concentration and temperature?

- | | |
|----------------------|---------------------|
| (1) Glucose | (2) Sodium chloride |
| (3) Calcium chloride | (4) Urea |

70. In the electrochemical series, a metal placed above hydrogen

- (1) Cannot displace hydrogen from acids
- (2) Can displace hydrogen from dilute acids
- (3) Is a strong oxidising agent
- (4) Has a positive reduction potential

71. The conductivity of an electrolytic solution decreases on dilution because

- (1) The degree of dissociation decreases
- (2) The number of ions per unit volume decreases
- (3) The ionic mobility decreases
- (4) The temperature falls

72. Which of the following statements is correct?

- (1) Order is always equal to molecularity
- (2) Order can be zero or fractional
- (3) Molecularity can be zero
- (4) Order is never experimentally determined

73. For a zero-order reaction, a plot of concentration against time is

- (1) An exponential curve
- (2) A straight line with negative slope
- (3) A straight line through the origin
- (4) A hyperbola

74. A catalyst increases the rate of a reaction by

- (1) Increasing the activation energy
- (2) Providing an alternative path of lower activation energy
- (3) Changing the equilibrium constant
- (4) Increasing the enthalpy change

75. The oxidation state of manganese in the manganate ion MnO_4^{2-} is

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

76. Which of the following ions acts as a strong reducing agent in aqueous solution?

- | | |
|---------------|---------------|
| (1) Mn^{3+} | (2) Cr^{2+} |
| (3) Fe^{3+} | (4) Cu^{2+} |

77. Interstitial compounds formed by transition metals are

- (1) Softer than the parent metal
- (2) Hard and chemically inert with high melting points
- (3) Good insulators
- (4) Always stoichiometric

78. Geometrical isomerism is shown by

- | | |
|------------------------|-------------------------|
| (1) $[Pt(NH_3)_2Cl_2]$ | (2) $[Co(NH_3)_6]^{3+}$ |
| (3) $[Ni(CO)_4]$ | (4) $[Ag(NH_3)_2]^+$ |

- 79.** The complex $[\text{Ni}(\text{CN})_4]^{2-}$ is
(1) Tetrahedral and paramagnetic
(2) Square planar and diamagnetic
(3) Octahedral and paramagnetic
(4) Square planar and paramagnetic
- 80.** Ethylenediaminetetraacetate (EDTA) is a
(1) Bidentate ligand
(2) Tridentate ligand
(3) Hexadentate ligand
(4) Monodentate ligand
- 81.** Dehydrohalogenation of 2-bromobutane with alcoholic KOH gives mainly
(1) But-1-ene
(2) But-2-ene
(3) Butan-2-ol
(4) Buta-1,3-diene
- 82.** Chlorobenzene is less reactive than ethyl chloride towards nucleophilic substitution because
(1) Of the +I effect of the ring
(2) The C-Cl bond has partial double bond character due to resonance
(3) Chlorine is more electronegative in chlorobenzene
(4) Of steric hindrance
- 83.** The correct order of ease of dehydration of alcohols with conc. H_2SO_4 is
(1) $1^\circ > 2^\circ > 3^\circ$
(2) $3^\circ > 2^\circ > 1^\circ$
(3) $2^\circ > 1^\circ > 3^\circ$
(4) All are equal
- 84.** Williamson's synthesis of tert-butyl methyl ether is best carried out using
(1) tert-Butyl bromide and sodium methoxide
(2) Methyl bromide and sodium tert-butoxide
(3) tert-Butyl alcohol and methanol
(4) Methanol and tert-butyl chloride
- 85.** Which compound undergoes the Cannizzaro reaction?
(1) Ethanal
(2) Propanal
(3) Methanal
(4) Butanal
- 86.** Tollens' reagent is used to distinguish between
(1) Aldehydes and ketones
(2) Alcohols and phenols
(3) Alkanes and alkenes
(4) Primary and secondary amines
- 87.** The Hell-Volhard-Zelinsky reaction introduces a halogen at the
(1) β -carbon
(2) α -carbon
(3) Carbonyl carbon
(4) Terminal carbon
- 88.** Hinsberg's reagent is used to
(1) Prepare amines from amides
(2) Distinguish primary, secondary and tertiary amines
(3) Reduce nitro compounds
(4) Convert amines to alcohols
- 89.** Aniline reacts with NaNO_2 and HCl at 273-278 K to give
(1) Nitrobenzene
(2) Benzenediazonium chloride
(3) Phenol
(4) Benzamide
- 90.** The secondary structure of a protein is primarily stabilised by
(1) Peptide bonds
(2) Hydrogen bonds
(3) Disulphide bridges
(4) Ionic bonds

BOTANY

91. A taxonomic key is based on

- (1) Similarities only
- (2) Contrasting characters arranged in couplets
- (3) Alphabetical order of names
- (4) Geographical distribution

92. Whittaker's five kingdom classification was NOT based on

- (1) Cell structure
- (2) Mode of nutrition
- (3) Body organisation
- (4) Habitat and geographical range

93. Methanogens found in the gut of ruminants belong to

- (1) Eubacteria
- (2) Archaeobacteria
- (3) Cyanobacteria
- (4) Actinomycetes

94. Viroids differ from viruses in that they

- (1) Have a protein coat but no nucleic acid
- (2) Consist of free RNA without a protein coat
- (3) Contain only DNA
- (4) Are non-infectious

95. Bryophytes are called the amphibians of the plant kingdom because they

- (1) Grow only in water
- (2) Live on land but need water for sexual reproduction
- (3) Have true roots
- (4) Produce seeds

96. Coralloid roots of Cycas are associated with

- (1) Mycorrhizal fungi
- (2) Nitrogen-fixing cyanobacteria
- (3) Rhizobium
- (4) Actinomycetes

97. Pneumatophores are found in

- (1) Sweet potato
- (2) Rhizophora
- (3) Banyan
- (4) Sugarcane

98. Racemose inflorescence is characterised by

- (1) The main axis terminating in a flower
- (2) The main axis continuing to grow with flowers borne laterally in acropetal order
- (3) Flowers arranged in basipetal order
- (4) A solitary terminal flower

99. Mango and coconut are examples of

- (1) Berry
- (2) Pome
- (3) Drupe
- (4) Legume

100. Annual rings in a tree trunk are produced because of

- (1) Activity of the cork cambium
- (2) Alternating formation of spring wood and autumn wood
- (3) Deposition of tannins
- (4) Formation of tyloses

101. Guard cells of grasses are

- (1) Bean-shaped
- (2) Dumb-bell shaped
- (3) Rectangular
- (4) Spherical

102. Which of the following xylem elements is living?

- (1) Tracheids
- (2) Vessels
- (3) Xylem fibres
- (4) Xylem parenchyma

103. The fluid mosaic model of the plasma membrane was proposed by

- (1) Robert Brown
- (2) Singer and Nicolson
- (3) Schleiden and Schwann
- (4) Robert Hooke

104. The nucleolus is the site of

- (1) DNA replication
- (2) Ribosomal RNA synthesis
- (3) Protein glycosylation
- (4) Lipid synthesis

105. Grana in a chloroplast are

- (1) Stacks of thylakoids
- (2) Fluid-filled stroma
- (3) Cristae of the inner membrane
- (4) Storage granules of starch

- 106.** An amino acid in aqueous solution at its isoelectric point exists as
 (1) A neutral molecule (2) A zwitterion
 (3) An anion only (4) A cation only
- 107.** A nucleotide differs from a nucleoside in having an additional
 (1) Nitrogen base (2) Sugar
 (3) Phosphate group (4) Hydroxyl group
- 108.** Replication of DNA takes place during
 (1) G₁ phase (2) S phase
 (3) G₂ phase (4) M phase
- 109.** Splitting of the centromere and movement of chromatids to opposite poles occurs during
 (1) Prophase (2) Metaphase
 (3) Anaphase (4) Telophase
- 110.** The Hill reaction demonstrated that the oxygen released during photosynthesis comes from
 (1) Carbon dioxide (2) Water
 (3) Glucose (4) Atmospheric oxygen
- 111.** According to the chemiosmotic hypothesis, ATP synthesis in chloroplasts is driven by
 (1) A proton gradient across the thylakoid membrane
 (2) Direct transfer of phosphate from NADPH
 (3) Substrate level phosphorylation
 (4) Breakdown of starch
- 112.** Blackman's law of limiting factors states that
 (1) All factors act independently
 (2) The rate is determined by the factor present in the smallest amount
 (3) Light is always the limiting factor
 (4) Temperature never limits photosynthesis
- 113.** Compared with C₃ plants, C₄ plants have
 (1) A higher CO₂ compensation point
 (2) A lower CO₂ compensation point and no photorespiration
 (3) No Calvin cycle
 (4) Only mesophyll chloroplasts
- 114.** Glycolysis takes place in the
 (1) Mitochondrial matrix
 (2) Cytoplasm
 (3) Inner mitochondrial membrane
 (4) Chloroplast stroma
- 115.** The conversion of pyruvate to acetyl CoA occurs in the
 (1) Cytoplasm
 (2) Mitochondrial matrix
 (3) Outer mitochondrial membrane
 (4) Peroxisome
- 116.** Delay of leaf senescence, known as the Richmond-Lang effect, is caused by
 (1) Auxin (2) Gibberellin
 (3) Cytokinin (4) Ethylene
- 117.** Ripening of fruits and abscission of leaves are promoted by
 (1) Ethylene (2) Cytokinin
 (3) Auxin (4) Gibberellin
- 118.** The hard, resistant outer layer of a pollen grain is made of
 (1) Cellulose (2) Pectin
 (3) Sporopollenin (4) Cutin
- 119.** Transfer of pollen from an anther to the stigma of another flower of the same plant is
 (1) Autogamy (2) Geitonogamy
 (3) Xenogamy (4) Cleistogamy
- 120.** Which of the following is an outbreeding device?
 (1) Cleistogamy
 (2) Self-incompatibility
 (3) Bisexual flowers with synchronous maturity
 (4) Homogamy
- 121.** Residual persistent nucellus in the seed is called
 (1) Perisperm (2) Pericarp
 (3) Aril (4) Caruncle
- 122.** A cross between red and white flowered Antirrhinum gives pink F₁ plants. The F₂ phenotypic ratio is
 (1) 3 : 1 (2) 1 : 2 : 1
 (3) 9 : 3 : 3 : 1 (4) 2 : 1

123. Linkage was demonstrated experimentally by

- (1) Mendel in garden pea
- (2) Morgan in *Drosophila*
- (3) Sutton in grasshopper
- (4) Correns in maize

124. Haemophilia is

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

125. A person of blood group AB marries one of blood group O. The possible blood groups of their children are

- (1) A and B only
- (2) AB and O only
- (3) A, B, AB and O
- (4) Only O

126. In the B-DNA double helix, the number of base pairs per turn and the pitch are

- (1) 10 bp and 3.4 nm
- (2) 20 bp and 3.4 nm
- (3) 10 bp and 0.34 nm
- (4) 34 bp and 2 nm

127. A transcription unit in DNA consists of

- (1) Only the structural gene
- (2) A promoter, structural gene and terminator
- (3) Exons only
- (4) A promoter and operator only

128. Which statement about the genetic code is INCORRECT?

- (1) It is degenerate
- (2) It is nearly universal
- (3) It is overlapping
- (4) It is read in a contiguous manner without punctuation

129. DNA fingerprinting is based on the polymorphism in

- (1) Coding sequences of genes
- (2) Repetitive satellite DNA (VNTR)
- (3) Ribosomal RNA
- (4) Mitochondrial proteins

130. Which of the following is NOT a population attribute?

- (1) Birth rate
- (2) Death rate
- (3) Sex ratio
- (4) Body weight of an individual

131. In the exponential growth equation $dN/dt = rN$, the term r represents

- (1) Carrying capacity
- (2) Intrinsic rate of natural increase
- (3) Population density
- (4) Environmental resistance

132. The correct sequence of steps in decomposition is

- (1) Leaching, fragmentation, catabolism, humification, mineralisation
- (2) Fragmentation, leaching, catabolism, humification, mineralisation
- (3) Catabolism, fragmentation, leaching, mineralisation, humification
- (4) Humification, mineralisation, fragmentation, leaching, catabolism

133. The pioneer species in a primary succession on bare rock are

- (1) Mosses
- (2) Lichens
- (3) Grasses
- (4) Shrubs

134. The 'evil quartet' responsible for biodiversity loss includes all EXCEPT

- (1) Habitat loss and fragmentation
- (2) Over-exploitation
- (3) Alien species invasion
- (4) Ex situ conservation

135. India, with about 2.4% of the world's land area, holds roughly what share of global species diversity?

- (1) 1.2%
- (2) 4.5%
- (3) 8.1%
- (4) 15%

ZOOLOGY

136. Choanocytes or collar cells are characteristic of

- (1) Porifera
- (2) Cnidaria
- (3) Ctenophora
- (4) Platyhelminthes

137. Nematocysts used for anchorage and defence occur in

- (1) Sponges
- (2) Cnidarians
- (3) Annelids
- (4) Molluscs

138. True metameric segmentation is first seen in

- (1) Platyhelminthes
- (2) Aschelminthes
- (3) Annelida
- (4) Arthropoda

139. Cartilaginous fishes must swim constantly because they lack

- (1) Gills
- (2) An air bladder
- (3) A notochord
- (4) Paired fins

140. Intercalated discs are a distinguishing feature of

- (1) Skeletal muscle
- (2) Smooth muscle
- (3) Cardiac muscle
- (4) Areolar tissue

141. The mouth parts of a cockroach are of the

- (1) Piercing and sucking type
- (2) Biting and chewing type
- (3) Sponging type
- (4) Siphoning type

142. During inspiration in humans

- (1) The diaphragm relaxes and thoracic volume decreases
- (2) The diaphragm contracts and thoracic volume increases
- (3) Only the internal intercostals contract
- (4) Intrapulmonary pressure rises above atmospheric pressure

143. Emphysema is characterised by

- (1) Inflammation of the bronchi only
- (2) Damage to alveolar walls reducing the respiratory surface
- (3) Spasm of the bronchiolar smooth muscle
- (4) Fibrosis due to silica dust

144. The partial pressure of oxygen in the alveoli is about

- (1) 40 mm Hg
- (2) 95 mm Hg
- (3) 104 mm Hg
- (4) 159 mm Hg

145. The QRS complex of an ECG represents

- (1) Atrial depolarisation
- (2) Ventricular depolarisation
- (3) Ventricular repolarisation
- (4) Atrial repolarisation

146. A person with blood group O can donate blood to

- (1) Group O only
- (2) Groups A and B only
- (3) All blood groups
- (4) Group AB only

147. Lymph differs from blood in

- (1) Containing more RBCs
- (2) Lacking RBCs and large plasma proteins
- (3) Lacking WBCs
- (4) Containing no plasma

148. The glomerular filtration rate in a healthy adult is about

- (1) 25 mL per minute
- (2) 125 mL per minute
- (3) 180 mL per minute
- (4) 1.5 L per minute

149. Renin is secreted by the

- (1) Adrenal cortex
- (2) Juxtaglomerular apparatus
- (3) Posterior pituitary
- (4) Collecting duct

150. The counter current mechanism of the kidney is maintained by

- (1) The Bowman's capsule and PCT
- (2) The loop of Henle and vasa recta
- (3) The glomerulus alone
- (4) The ureter

151. During muscle contraction, which of the following does NOT change in length?

- (1) I band
- (2) H zone
- (3) A band
- (4) Sarcomere

152. Myasthenia gravis is

- (1) A degenerative joint disease
- (2) An autoimmune disorder affecting the neuromuscular junction
- (3) Caused by uric acid deposition
- (4) A deficiency of calcium

153. The joint between the humerus and the pectoral girdle is a

- | | |
|---------------------------|-------------------|
| (1) Hinge joint | (2) Pivot joint |
| (3) Ball and socket joint | (4) Gliding joint |

154. At a chemical synapse, the arrival of an impulse causes

- (1) Direct flow of ions through gap junctions
- (2) Release of neurotransmitter by fusion of synaptic vesicles with the presynaptic membrane
- (3) Reversal of the resting potential in the dendrite only
- (4) Hyperpolarisation of the axon terminal

155. The correct order of the cranial meninges from outside inwards is

- (1) Pia mater, arachnoid, dura mater
- (2) Dura mater, arachnoid, pia mater
- (3) Arachnoid, dura mater, pia mater
- (4) Dura mater, pia mater, arachnoid

156. Rhodopsin, the pigment of twilight vision, is present in

- | | |
|--------------------|-------------------|
| (1) Cone cells | (2) Rod cells |
| (3) Ganglion cells | (4) Bipolar cells |

157. Simple goitre is caused by the deficiency of

- | | |
|-------------|---------------|
| (1) Iron | (2) Iodine |
| (3) Calcium | (4) Vitamin D |

158. Protein and peptide hormones generally act by

- (1) Entering the nucleus directly
- (2) Binding to membrane receptors and generating second messengers such as cAMP
- (3) Binding to intracellular receptors
- (4) Altering membrane permeability to oxygen

159. Thymosin is responsible for

- (1) Differentiation of T lymphocytes
- (2) Regulation of blood calcium
- (3) Secretion of gastric juice
- (4) Stimulating ovulation

160. The transformation of spermatids into spermatozoa is called

- | | |
|---------------------|--------------------|
| (1) Spermatogenesis | (2) Spermiogenesis |
| (3) Spermiation | (4) Meiosis |

161. Ovulation in the human menstrual cycle is triggered by

- | | |
|----------------------------|-------------------|
| (1) A surge of FSH | (2) A surge of LH |
| (3) A fall in progesterone | (4) A rise in hCG |

162. Which hormone is NOT secreted by the placenta?

- (1) hCG
- (2) Human placental lactogen
- (3) Progesterone
- (4) Follicle stimulating hormone

163. The part of the blastocyst that attaches to the uterine endometrium is the

- | | |
|---------------------|--------------------|
| (1) Inner cell mass | (2) Trophoblast |
| (3) Blastocoel | (4) Zona pellucida |

164. Amniocentesis is legally banned for

- (1) Detecting chromosomal disorders
- (2) Detecting metabolic disorders
- (3) Determining the sex of the foetus
- (4) Detecting neural tube defects

165. Lactational amenorrhoea is effective as a contraceptive method for a maximum of about

- (1) Six months after parturition
- (2) One year after parturition
- (3) Two years after parturition
- (4) Three months after parturition

166. 'Saheli' is

- (1) A copper releasing IUD
- (2) A non-steroidal oral pill taken once a week
- (3) An injectable contraceptive
- (4) A barrier method

167. The experiment of Miller and Urey supported the theory of

- | | |
|----------------------------|--------------------------------|
| (1) Spontaneous generation | (2) Chemical evolution of life |
| (3) Special creation | (4) Panspermia |

168. Darwin's finches on the Galapagos Islands are a classic example of

- | | |
|--------------------------|--------------------------|
| (1) Convergent evolution | (2) Adaptive radiation |
| (3) Genetic drift | (4) Artificial selection |

- 169.** Archaeopteryx is regarded as a connecting link between
 (1) Fishes and amphibians (2) Amphibians and reptiles
 (3) Reptiles and birds (4) Reptiles and mammals
- 170.** The forelimbs of a whale, a bat and a cheetah illustrate
 (1) Analogy and convergent evolution
 (2) Homology and divergent evolution
 (3) Vestigial organs
 (4) Atavism
- 171.** Ascariasis is transmitted mainly through
 (1) The bite of a female Anopheles mosquito
 (2) Contaminated water, vegetables and soil carrying eggs
 (3) Direct contact with an infected person's skin
 (4) Blood transfusion
- 172.** Which of the following is NOT a component of innate immunity?
 (1) Physical barriers such as skin
 (2) Phagocytic leucocytes
 (3) Interferons
 (4) Antibody production against a specific antigen
- 173.** The antibody present in colostrum that gives a newborn passive immunity is
 (1) IgG (2) IgA
 (3) IgM (4) IgE
- 174.** The property by which cancer cells spread to distant sites through the blood is called
 (1) Metastasis (2) Contact inhibition
 (3) Apoptosis (4) Differentiation
- 175.** Cannabinoids are obtained from
 (1) Papaver somniferum (2) Cannabis sativa
 (3) Erythroxylum coca (4) Atropa belladonna
- 176.** During agarose gel electrophoresis, DNA fragments move towards the
 (1) Cathode, because DNA is positively charged
 (2) Anode, because DNA is negatively charged
 (3) Either electrode depending on size
 (4) Centre of the gel
- 177.** Separated DNA fragments in a gel are visualised by staining with
 (1) Methylene blue and visible light
 (2) Ethidium bromide and exposure to UV radiation
 (3) Safranin and X-rays
 (4) Iodine solution
- 178.** The most commonly used bioreactor for large scale production is the
 (1) Simple stirred tank bioreactor
 (2) Sparged stirred tank bioreactor
 (3) Continuous flow tubular reactor
 (4) Packed bed reactor
- 179.** Golden rice is a transgenic variety enriched in
 (1) Iron (2) Vitamin C
 (3) Provitamin A (β -carotene) (4) Lysine
- 180.** Human insulin produced by Eli Lilly using recombinant DNA technology involved
 (1) Extracting insulin from pig pancreas
 (2) Producing A and B chains separately in E. coli and joining them by disulphide bonds
 (3) Synthesising proinsulin in yeast only
 (4) Chemical synthesis of the whole hormone

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>
