

NEET (UG) – 2027 PRACTICE EXAMINATION MOST-EXPECTED FULL SYLLABUS TEST BOOKLET			SET 5
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Candidate	Aamirah Fathima	Test Booklet Set	5
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 SI unit of luminous intensity is the

- | | |
|-------------|----------|
| (1) Lumen | (2) Lux |
| (3) Candela | (4) Watt |

2. A screw gauge has a pitch of 1 mm and 100 divisions on its circular scale. Its least count is

- | | |
|-------------|--------------|
| (1) 1 mm | (2) 0.1 mm |
| (3) 0.01 mm | (4) 0.001 mm |

3. A car moving at 20 m s^{-1} is brought to rest in a distance of 100 m. The uniform retardation is

- | | |
|--------------------------|--------------------------|
| (1) 1 m s^{-2} | (2) 2 m s^{-2} |
| (3) 4 m s^{-2} | (4) 5 m s^{-2} |

4. A body thrown vertically upwards, at the highest point of its path, has

- (1) Zero velocity and zero acceleration
- (2) Zero velocity and acceleration g downwards
- (3) Maximum velocity and zero acceleration
- (4) Zero acceleration and maximum velocity

5. Action and reaction forces described by Newton's third law

- (1) Act on the same body and cancel out
- (2) Act on two different bodies and never cancel
- (3) Are unequal in magnitude
- (4) Act in the same direction

6. The propulsion of a rocket is based on the principle of conservation of

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

7. A man of mass 60 kg climbs a staircase of height 5 m in 10 s. His power output is ($g = 10 \text{ m s}^{-2}$)

- | | |
|-----------|------------|
| (1) 30 W | (2) 150 W |
| (3) 300 W | (4) 3000 W |

8. A ball dropped from a height h rebounds to a height $h/4$. The coefficient of restitution is

- | | |
|----------|---------|
| (1) 0.25 | (2) 0.5 |
| (3) 0.75 | (4) 1.0 |

9. A body of moment of inertia 0.5 kg m^2 rotates with an angular velocity of 4 rad s^{-1} . Its angular momentum is

- | | |
|---|---------------------------------------|
| (1) $0.125 \text{ kg m}^2 \text{ s}^{-1}$ | (2) $2 \text{ kg m}^2 \text{ s}^{-1}$ |
| (3) $4 \text{ kg m}^2 \text{ s}^{-1}$ | (4) $8 \text{ kg m}^2 \text{ s}^{-1}$ |

10. The rotational kinetic energy of a body of moment of inertia I rotating with angular velocity ω is

- | | |
|----------------------------|--------------------------|
| (1) $I\omega$ | (2) $\frac{1}{2}I\omega$ |
| (3) $\frac{1}{2}I\omega^2$ | (4) $I\omega^2$ |

11. The relation between escape velocity v_e and orbital velocity v_o for a satellite close to the earth's surface is

- | | |
|------------------|--------------------------|
| (1) $v_e = v_o$ | (2) $v_e = \sqrt{2} v_o$ |
| (3) $v_e = 2v_o$ | (4) $v_e = v_o/\sqrt{2}$ |

12. The gravitational field intensity at a point inside a uniform spherical shell is

- (1) Maximum at the centre
- (2) Zero everywhere inside
- (3) GM/R^2
- (4) Proportional to the distance from the centre

13. In a stress-strain curve, Hooke's law is obeyed up to the

- (1) Breaking point
- (2) Proportional limit
- (3) Yield point
- (4) Elastic limit only after yielding

14. The viscous force on a small sphere of radius r moving with velocity v through a fluid of viscosity η is given by

- | | |
|-------------------|---------------------|
| (1) $6\pi\eta rv$ | (2) $4\pi\eta r^2v$ |
| (3) $\pi\eta rv$ | (4) $6\pi\eta r^2v$ |

15. The work done in blowing a soap bubble of radius r and surface tension T is

- | | |
|-----------------|-----------------|
| (1) $4\pi r^2T$ | (2) $8\pi r^2T$ |
| (3) $2\pi r^2T$ | (4) πr^2T |

16. According to Newton's law of cooling, the rate of loss of heat of a body is proportional to

- (1) The fourth power of its absolute temperature
- (2) The temperature difference between the body and its surroundings
- (3) Its specific heat
- (4) The square of the temperature difference

17. A heat engine absorbs 1000 J of heat from the source and rejects 600 J to the sink. Its efficiency is

- | | |
|---------|---------|
| (1) 20% | (2) 40% |
| (3) 60% | (4) 80% |

18. For an adiabatic process involving an ideal gas, which relation holds?

- (1) $PV = \text{constant}$
- (2) $TV^{(\gamma-1)} = \text{constant}$
- (3) $P/T = \text{constant}$
- (4) $V/T = \text{constant}$

19. At constant temperature, the pressure of a given mass of an ideal gas is

- (1) Directly proportional to volume
- (2) Inversely proportional to volume
- (3) Independent of volume
- (4) Proportional to the square of the volume

20. In simple harmonic motion, the phase difference between displacement and acceleration is

- (1) Zero
- (2) $\pi/2$
- (3) π
- (4) 2π

21. Two springs of force constants k_1 and k_2 are joined in series. The effective force constant is

- (1) $k_1 + k_2$
- (2) $k_1 k_2 / (k_1 + k_2)$
- (3) $(k_1 + k_2) / k_1 k_2$
- (4) $k_1 - k_2$

22. Two waves of amplitudes 3 cm and 4 cm arrive in phase at a point. The resultant amplitude is

- (1) 1 cm
- (2) 5 cm
- (3) 7 cm
- (4) 12 cm

23. The intensity level of sound is measured in decibels using a scale that is

- (1) Linear in intensity
- (2) Logarithmic in intensity
- (3) Inversely proportional to intensity
- (4) Independent of intensity

24. The torque acting on an electric dipole of moment p placed in a uniform field E is maximum when the angle between p and E is

- (1) 0°
- (2) 45°
- (3) 90°
- (4) 180°

25. If the net charge enclosed by a closed surface is zero, then

- (1) The electric field is zero everywhere on the surface
- (2) The net electric flux through the surface is zero
- (3) The surface must be spherical
- (4) The potential is zero on the surface

26. The charge on a 5 μF capacitor charged to a potential difference of 200 V is

- (1) $2.5 \times 10^{-5} \text{ C}$
- (2) $1 \times 10^{-3} \text{ C}$
- (3) $4 \times 10^{-2} \text{ C}$
- (4) $1 \times 10^3 \text{ C}$

27. Which of the following is a non-ohmic device?

- (1) A metallic wire at constant temperature
- (2) A junction diode
- (3) A carbon resistor at constant temperature
- (4) A nichrome coil at constant temperature

28. An ideal voltmeter should have

- (1) Zero resistance and be connected in series
- (2) Infinite resistance and be connected in parallel
- (3) Zero resistance and be connected in parallel
- (4) Infinite resistance and be connected in series

29. A galvanometer is converted into an ammeter by connecting

- (1) A high resistance in series
- (2) A low resistance in parallel
- (3) A high resistance in parallel
- (4) A low resistance in series

30. A straight conductor of length 0.5 m carrying a current of 2 A is placed perpendicular to a magnetic field of 0.1 T. The force on it is

- (1) 0.01 N
- (2) 0.1 N
- (3) 1 N
- (4) 10 N

31. The magnetic field inside a long current-carrying solenoid is

- (1) Zero
- (2) Uniform and equal to $\mu_0 nI$
- (3) Proportional to the distance from the axis
- (4) Maximum at the ends

32. A bar magnet of magnetic moment M is cut into two equal halves perpendicular to its length. The magnetic moment of each piece is

- (1) M
- (2) $M/2$
- (3) $2M$
- (4) $M/4$

33. The direction of the current induced in a conductor moving in a magnetic field is given by

- (1) Fleming's left hand rule
- (2) Fleming's right hand rule
- (3) Ampere's rule
- (4) The right hand thumb rule

34. Energy loss due to eddy currents in a transformer is reduced by

- (1) Using a solid iron core
- (2) Using a laminated core
- (3) Increasing the number of turns
- (4) Using a copper core

35. In an AC circuit, the power factor is given by

- (1) Z/R
- (2) R/Z
- (3) X_L/R
- (4) R/X_C

36. The peak voltage of a 220 V AC mains supply is nearly

- (1) 220 V
- (2) 156 V
- (3) 311 V
- (4) 440 V

37. The speed of electromagnetic waves in free space is given by

- (1) $\sqrt{(\mu_0\epsilon_0)}$
- (2) $1/\sqrt{(\mu_0\epsilon_0)}$
- (3) $\mu_0\epsilon_0$
- (4) $1/\mu_0\epsilon_0$

38. An object is placed 15 cm in front of a concave mirror of focal length 10 cm. The image distance is

- (1) 6 cm
- (2) 10 cm
- (3) 30 cm
- (4) 60 cm

39. Dispersion of white light by a prism occurs because

- (1) The prism absorbs some colours
- (2) The refractive index of the prism differs for different wavelengths
- (3) Light is polarised by the prism
- (4) Of total internal reflection

40. Unpolarised light of intensity I_0 passes through two polaroids whose axes make an angle of 60° . The emergent intensity is

- (1) $I_0/2$
- (2) $I_0/4$
- (3) $I_0/8$
- (4) I_0

41. In a diffraction pattern due to a single slit, the width of the central maximum

- (1) Increases as the slit is made wider
- (2) Decreases as the slit is made wider
- (3) Is independent of the slit width
- (4) Is zero for monochromatic light

42. The de Broglie wavelength associated with a moving cricket ball is not observed because

- (1) The ball is not charged
- (2) Its mass is very large, making the wavelength immeasurably small
- (3) The ball moves too slowly
- (4) Light cannot reach the ball

43. The energy released in the fission of a single uranium-235 nucleus is about

- (1) 2 MeV
- (2) 20 MeV
- (3) 200 MeV
- (4) 2000 MeV

44. The energy required to ionise a hydrogen atom in its ground state is

- (1) 3.4 eV
- (2) 10.2 eV
- (3) 13.6 eV
- (4) 27.2 eV

45. The logic gate whose output is 1 only when both of its inputs are 1 is

- (1) OR
- (2) AND
- (3) NOR
- (4) NOT

CHEMISTRY

- 46.** The number of atoms present in one mole of oxygen gas, O_2 , is
(1) 6.022×10^{23} (2) 1.204×10^{24}
(3) 3.011×10^{23} (4) 2.408×10^{24}
- 47.** A solution contains 2 moles of solute in 8 moles of solvent. The mole fraction of the solute is
(1) 0.1 (2) 0.2
(3) 0.25 (4) 0.8
- 48.** The energy of a photon is related to the wavelength of radiation by
(1) $E = h\lambda$ (2) $E = hc/\lambda$
(3) $E = h/\lambda$ (4) $E = hc\lambda$
- 49.** Pauli's exclusion principle states that
(1) Electrons occupy orbitals of lowest energy first
(2) No two electrons in an atom can have the same set of four quantum numbers
(3) Electrons pair only after each orbital is singly filled
(4) Electrons revolve in fixed orbits
- 50.** On moving down a group in the periodic table, the metallic character
(1) Decreases
(2) Increases
(3) Remains unchanged
(4) First increases then decreases
- 51.** An element with the electronic configuration $1s^2 2s^2 2p^6 3s^1$ is
(1) A halogen (2) An alkali metal
(3) A noble gas (4) A transition metal
- 52.** The hybridisation and shape of SF_6 are
(1) sp^3d , trigonal bipyramidal (2) sp^3d^2 , octahedral
(3) sp^3 , tetrahedral (4) sp^2 , trigonal planar
- 53.** Among the following, the bond with the greatest ionic character is
(1) H-H (2) H-Cl
(3) H-F (4) H-I
- 54.** A sigma bond is stronger than a pi bond because
(1) It is formed by sideways overlap
(2) It is formed by head-on axial overlap giving greater overlap
(3) It involves only s orbitals
(4) It has no directional character
- 55.** The bond order of the peroxide ion O_2^{2-} is
(1) 1 (2) 1.5
(3) 2 (4) 2.5
- 56.** The work done when a gas expands by ΔV against a constant external pressure P is
(1) $+P\Delta V$ (2) $-P\Delta V$
(3) $P\Delta V/2$ (4) Zero
- 57.** According to the third law of thermodynamics, the entropy of a perfectly crystalline substance at absolute zero is
(1) Infinite (2) Zero
(3) Negative (4) Equal to its enthalpy
- 58.** For an exothermic reaction at equilibrium, an increase in temperature
(1) Shifts the equilibrium in the forward direction
(2) Shifts the equilibrium in the backward direction
(3) Has no effect
(4) Increases the equilibrium constant
- 59.** Among the acids listed, the strongest is the one with a pK_a of
(1) 2.0 (2) 4.8
(3) 7.0 (4) 9.2
- 60.** Which of the following mixtures forms an acidic buffer?
(1) NH_4OH and NH_4Cl (2) CH_3COOH and CH_3COONa
(3) $NaOH$ and $NaCl$ (4) HCl and $NaCl$
- 61.** The oxidation number of sulphur in H_2SO_4 is
(1) +2 (2) +4
(3) +6 (4) -2
- 62.** The inductive effect along a carbon chain
(1) Increases with distance from the substituent
(2) Decreases rapidly with distance and is negligible beyond three carbons
(3) Is independent of distance
(4) Operates only through pi bonds

63. Lassaigne's test is used for the detection of

- (1) Carbon and hydrogen
- (2) Nitrogen, sulphur and halogens
- (3) Oxygen only
- (4) Double bonds

64. In chromatography, the retardation factor R_f is defined as

- (1) Distance moved by solvent/distance moved by substance
- (2) Distance moved by substance/distance moved by solvent
- (3) Mass of substance/mass of solvent
- (4) Time taken by substance/time taken by solvent

65. In ethane, the staggered conformation is more stable than the eclipsed because of

- (1) Greater bond length
- (2) Lower torsional strain
- (3) Stronger hydrogen bonding
- (4) Higher symmetry

66. But-2-ene exhibits cis-trans isomerism because

- (1) It has a chiral carbon
- (2) Rotation about the carbon-carbon double bond is restricted
- (3) It has a triple bond
- (4) It is aromatic

67. The nitro group in nitrobenzene directs an incoming electrophile to the

- (1) Ortho position only
- (2) Para position only
- (3) Meta position
- (4) Ortho and para positions

68. For an ideal solution obeying Raoult's law over the whole range of composition

- (1) $\Delta H_{\text{mix}} > 0$ and $\Delta V_{\text{mix}} > 0$
- (2) $\Delta H_{\text{mix}} = 0$ and $\Delta V_{\text{mix}} = 0$
- (3) $\Delta H_{\text{mix}} < 0$ and $\Delta V_{\text{mix}} < 0$
- (4) $\Delta H_{\text{mix}} = 0$ but $\Delta V_{\text{mix}} > 0$

69. Two solutions are said to be isotonic when they have the same

- (1) Molar mass
- (2) Osmotic pressure at the same temperature
- (3) Density
- (4) Vapour pressure at all temperatures

70. The standard electrode potential of the standard hydrogen electrode is taken as

- (1) +1.00 V
- (2) 0.00 V
- (3) -1.00 V
- (4) +0.76 V

71. Galvanisation protects iron from rusting because zinc

- (1) Is harder than iron
- (2) Has a more negative reduction potential and is oxidised in preference to iron
- (3) Forms an unreactive alloy with iron
- (4) Prevents contact with water only

72. The acid hydrolysis of an ester in a large excess of water follows

- (1) Zero order kinetics
- (2) Pseudo first order kinetics
- (3) True second order kinetics
- (4) Third order kinetics

73. According to collision theory, an effective collision requires

- (1) Only sufficient energy
- (2) Sufficient energy and proper orientation of the colliding molecules
- (3) Only proper orientation
- (4) A catalyst in all cases

74. Transition elements show variable oxidation states because

- (1) Their atomic radii are large
- (2) The energies of the ns and (n - 1)d orbitals are comparable
- (3) They are all paramagnetic
- (4) They form coloured compounds

75. On adding alkali to an orange solution of potassium dichromate, the colour changes to

- (1) Blue, forming chromium(II)
- (2) Yellow, forming the chromate ion
- (3) Green, forming Cr^{3+}
- (4) Colourless

76. Compared with lanthanoids, actinoids show

- (1) Fewer oxidation states
- (2) A larger number of oxidation states
- (3) No radioactivity
- (4) No contraction in size

- 77.** The number of ions furnished in aqueous solution by $[\text{Co}(\text{NH}_3)_6]\text{Cl}_3$ is
 (1) 2 (2) 3
 (3) 4 (4) 6
- 78.** Optical isomerism is shown by
 (1) $[\text{Co}(\text{NH}_3)_6]^{3+}$ (2) $[\text{Co}(\text{en})_3]^{3+}$
 (3) $[\text{PtCl}_4]^{2-}$ (4) $[\text{Ni}(\text{CO})_4]$
- 79.** The IUPAC name of $[\text{Ni}(\text{CO})_4]$ is
 (1) Nickel tetracarbonyl(II) (2) Tetracarbonylnickel(0)
 (3) Tetracarbonylnickelate(0) (4) Nickel(IV) carbonyl
- 80.** A Grignard reagent must be prepared and handled under anhydrous conditions because it
 (1) Is explosive in air
 (2) Reacts readily with water to give an alkane
 (3) Decomposes in sunlight
 (4) Polymerises in water
- 81.** Iodoform, CHI_3 , was formerly used as
 (1) A refrigerant (2) An antiseptic
 (3) A fire extinguisher (4) An anaesthetic
- 82.** Phenol can be distinguished from ethanol by using
 (1) Sodium metal
 (2) Neutral ferric chloride solution
 (3) Lucas reagent
 (4) Bromine in carbon tetrachloride
- 83.** Cleavage of methoxyethane with hot concentrated HI gives
 (1) Methanol and iodoethane (2) Iodomethane and ethanol
 (3) Two molecules of methanol (4) Ethene and methanol
- 84.** The Etard reaction converts toluene into benzaldehyde using
 (1) Acidified KMnO_4 (2) Chromyl chloride
 (3) Ozone (4) Zinc dust
- 85.** The correct order of acidic strength among ethanol, phenol and ethanoic acid is
 (1) Ethanol > phenol > ethanoic acid
 (2) Ethanoic acid > phenol > ethanol
 (3) Phenol > ethanoic acid > ethanol
 (4) Ethanoic acid > ethanol > phenol
- 86.** Rosenmund reduction of an acyl chloride gives
 (1) A primary alcohol (2) An aldehyde
 (3) A ketone (4) An alkane
- 87.** Hofmann bromamide degradation of an amide produces a primary amine having
 (1) The same number of carbon atoms
 (2) One carbon atom less
 (3) One carbon atom more
 (4) Two carbon atoms less
- 88.** Reduction of nitrobenzene with tin and concentrated hydrochloric acid gives
 (1) Nitrosobenzene (2) Aniline
 (3) Phenol (4) Azobenzene
- 89.** Enzymes that are made of RNA rather than protein are called
 (1) Coenzymes (2) Ribozymes
 (3) Apoenzymes (4) Holoenzymes
- 90.** Starch is a mixture of
 (1) Amylose and amylopectin (2) Glucose and fructose
 (3) Cellulose and glycogen (4) Maltose and lactose

BOTANY

91. Any unit of classification representing a real group of organisms at any level is called a

- (1) Species
- (2) Taxon
- (3) Genus
- (4) Key

92. Genetic material is transferred between bacteria without the formation of gametes during

- (1) Binary fission
- (2) Conjugation
- (3) Endospore formation
- (4) Budding

93. The cell wall of diatoms is made of

- (1) Cellulose
- (2) Indestructible silica forming a soapbox-like structure
- (3) Chitin
- (4) Pectin

94. The crystalline nature of tobacco mosaic virus was demonstrated by

- (1) Ivanowsky
- (2) M. W. Beijerinck
- (3) W. M. Stanley
- (4) Diener

95. The red colour of Rhodophyceae is due to the pigment

- (1) Fucoxanthin
- (2) r-Phycoerythrin
- (3) Phycocyanin
- (4) Chlorophyll b

96. Which of the following is a characteristic of monocotyledons?

- (1) Two cotyledons and reticulate venation
- (2) One cotyledon and parallel venation
- (3) Two cotyledons and parallel venation
- (4) One cotyledon and tetramerous flowers

97. A fibrous root system, in which the primary root is short lived and replaced by many roots, is characteristic of

- (1) Mustard
- (2) Wheat
- (3) Gram
- (4) Banyan

98. Neem shows a leaf that is

- (1) Simple
- (2) Pinnately compound
- (3) Palmately compound
- (4) Sessile and simple

99. A flower that can be divided into two equal halves by only one particular vertical plane is

- (1) Actinomorphic
- (2) Zygomorphic
- (3) Asymmetric
- (4) Trimerous

100. The three tissue systems of a flowering plant are

- (1) Epidermal, ground and vascular
- (2) Meristematic, permanent and secondary
- (3) Dermal, cortical and medullary
- (4) Simple, complex and secretory

101. Trichomes present on the stem differ from root hairs in being

- (1) Unicellular
- (2) Multicellular and often branched
- (3) Non-living
- (4) Absorptive in function

102. In the leaves of C_4 plants, the bundle sheath cells are

- (1) Absent
- (2) Large, thick walled with no intercellular spaces
- (3) Thin walled with many intercellular spaces
- (4) Present only in the midrib

103. Cytoplasmic connections between adjacent plant cells through the cell wall are called

- (1) Desmosomes
- (2) Plasmodesmata
- (3) Gap junctions
- (4) Tight junctions

104. The membrane bounding the large central vacuole of a mature plant cell is the

- (1) Plasmalemma
- (2) Tonoplast
- (3) Thylakoid membrane
- (4) Nuclear envelope

105. Which organelle is a site of β -oxidation of fatty acids and contains oxidative enzymes?

- (1) Ribosome
- (2) Peroxisome
- (3) Golgi body
- (4) Centriole

106. Substances of low molecular weight found in the acid soluble fraction of a cell are called

- (1) Macromolecules
- (2) Micromolecules or metabolites
- (3) Polymers
- (4) Enzymes

107. A non-protein organic compound tightly bound to an enzyme and essential for its activity is called a

- (1) Substrate
- (2) Prosthetic group
- (3) Competitive inhibitor
- (4) Product

108. Mitosis is described as an equational division because

- (1) The chromosome number is halved
- (2) The chromosome number in the daughter cells remains the same as in the parent
- (3) DNA is not replicated
- (4) Four daughter cells are formed

109. One diploid cell undergoing meiosis produces

- (1) Two diploid cells
- (2) Two haploid cells
- (3) Four haploid cells
- (4) Four diploid cells

110. A graph of the rate of photosynthesis plotted against the wavelength of light is called the

- (1) Absorption spectrum
- (2) Action spectrum
- (3) Emission spectrum
- (4) Fluorescence spectrum

111. The light reaction and the biosynthetic phase of photosynthesis take place respectively in the

- (1) Stroma and thylakoid
- (2) Thylakoid membranes and stroma
- (3) Both in the stroma
- (4) Both in the thylakoid

112. Engelmann's experiment, which described the first action spectrum of photosynthesis, used

- (1) Chlorella and oxygen electrodes
- (2) Cladophora and aerobic bacteria
- (3) Hydrilla in bicarbonate
- (4) Isolated chloroplasts

113. Oxidation of one molecule of NADH in the electron transport system yields about

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

114. In skeletal muscle under oxygen deficiency, pyruvic acid is converted into

- (1) Ethanol
- (2) Lactic acid
- (3) Acetyl CoA
- (4) Citric acid

115. Plants that flower only when exposed to a light period shorter than a critical duration are called

- (1) Long day plants
- (2) Short day plants
- (3) Day neutral plants
- (4) Vernalised plants

116. Absciscic acid is called the stress hormone because it

- (1) Promotes cell division
- (2) Stimulates stomatal closure and induces dormancy
- (3) Causes bolting
- (4) Delays senescence

117. A pollen grain at the time of shedding in most angiosperms is

- (1) Single celled
- (2) Two celled with a vegetative and a generative cell
- (3) Four celled
- (4) Always three celled

118. Wind pollinated flowers are typically characterised by

- (1) Large brightly coloured petals and nectar
- (2) Well exposed stamens and large feathery stigmas
- (3) Sticky heavy pollen
- (4) Strong fragrance

119. Pollination by water is seen in

- (1) Vallisneria and Zostera
- (2) Salvia and Yucca
- (3) Wheat and maize
- (4) Hibiscus and rose

120. The advantage of the seed habit in angiosperms is that

- (1) Seeds always germinate immediately
- (2) The embryo is protected and provided with reserve food for dispersal
- (3) Seeds prevent genetic variation
- (4) Seeds eliminate the need for pollination

121. Mendel selected the garden pea for his experiments mainly because it

- (1) Is a perennial with a long life cycle
- (2) Has several contrasting traits, is self pollinating and has a short life cycle
- (3) Shows only continuous variation
- (4) Cannot be artificially cross pollinated

122. The law of independent assortment holds good for genes that are

- (1) On the same chromosome and closely linked
- (2) On different chromosomes or far apart on the same chromosome
- (3) Always dominant
- (4) Sex linked only

123. Thalassemia differs from sickle cell anaemia in that thalassemia is

- (1) A qualitative defect in globin chain structure
- (2) A quantitative defect in the synthesis of globin chains
- (3) Caused by a single base substitution
- (4) Not inherited

124. Insertion or deletion of a single base pair in a gene causes

- (1) A point mutation with no effect
- (2) A frameshift mutation altering the reading frame
- (3) Chromosomal aberration
- (4) Polyploidy

125. In birds, the female is

- (1) Homogametic, ZZ
- (2) Heterogametic, ZW
- (3) Homogametic, XX
- (4) Heterogametic, XO

126. Hershey and Chase distinguished DNA from protein in bacteriophages by using radioactive

- (1) Carbon and nitrogen
- (2) Sulphur and phosphorus
- (3) Nitrogen and oxygen
- (4) Hydrogen and carbon

127. The central dogma of molecular biology was proposed by

- (1) Watson
- (2) Crick
- (3) Nirenberg
- (4) Khorana

128. The initiation codon AUG codes for the amino acid

- (1) Tryptophan
- (2) Methionine
- (3) Alanine
- (4) Glycine

129. Satellite DNA, useful in DNA fingerprinting, is

- (1) A coding sequence
- (2) A repetitive non-coding sequence showing high polymorphism
- (3) Present only in mitochondria
- (4) A regulatory promoter

130. Organisms that can tolerate and thrive in a wide range of temperatures are described as

- (1) Stenothermal
- (2) Eurythermal
- (3) Stenohaline
- (4) Euryhaline

131. Polar bears undergo winter sleep, while snails and fish in summer enter a state of reduced activity called

- (1) Hibernation
- (2) Aestivation
- (3) Diapause
- (4) Migration

132. In a deep water aquatic ecosystem, the major conduit of energy flow is the

- (1) Detritus food chain
- (2) Grazing food chain
- (3) Parasitic chain
- (4) Saprophytic chain

133. The pyramid of numbers in a single large tree supporting many insects and birds is

- (1) Upright
- (2) Inverted
- (3) Spindle shaped
- (4) Always linear

134. Diversity at the level of the genes within a single species, such as *Rauwolfia vomitoria* growing in different Himalayan ranges, is called

- (1) Species diversity
- (2) Genetic diversity
- (3) Ecological diversity
- (4) Taxonomic diversity

135. The Amazon rainforest is often called the lungs of the planet because it

- (1) Absorbs all the world's rainfall
- (2) Is estimated to produce a large share of the earth's oxygen through photosynthesis
- (3) Contains no animal life
- (4) Has the coldest climate

ZOOLOGY

136. In sponges, water enters through minute pores called ostia into the

- (1) Osculum
- (2) Spongocoel
- (3) Coelom
- (4) Gastrovascular cavity

137. Eight external rows of ciliated comb plates used in locomotion are characteristic of

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

138. Bony fishes differ from cartilaginous fishes in having

- (1) A ventral mouth
- (2) Gill slits without an operculum
- (3) Gills covered by an operculum and an air bladder
- (4) A placoid scaled skin

139. Heterodont dentition, in which teeth are of different types, is characteristic of

- (1) Amphibians
- (2) Reptiles
- (3) Birds
- (4) Mammals

140. Neuroglial cells of nervous tissue

- (1) Transmit nerve impulses
- (2) Protect and support the neurons
- (3) Secrete hormones
- (4) Contract like muscle

141. In the cockroach, hepatic caeca are found at the junction of the

- (1) Foregut and midgut
- (2) Midgut and hindgut
- (3) Crop and gizzard
- (4) Ileum and colon

142. Inspiratory capacity is equal to

- (1) Tidal volume + expiratory reserve volume
- (2) Tidal volume + inspiratory reserve volume
- (3) Vital capacity + residual volume
- (4) Inspiratory reserve volume + residual volume

143. Asthma is characterised by

- (1) Damage to alveolar walls
- (2) Difficulty in breathing due to inflammation of the bronchi and bronchioles
- (3) Fibrosis of the upper lung
- (4) Loss of the pleural membrane

144. Purkinje fibres are specialised to

- (1) Generate the initial impulse
- (2) Conduct impulses rapidly throughout the ventricular musculature
- (3) Secrete hormones
- (4) Prevent backflow of blood

145. Erythroblastosis foetalis occurs when

- (1) An Rh positive mother carries an Rh negative foetus
- (2) An Rh negative mother carries an Rh positive foetus
- (3) Both mother and foetus are Rh negative
- (4) Both mother and foetus are Rh positive

146. Angina pectoris is caused by

- (1) Inflammation of the pericardium
- (2) Insufficient oxygen reaching the heart muscle
- (3) Failure of the SA node
- (4) Excess of platelets

147. The distal convoluted tubule is important for

- (1) Filtration of blood
- (2) Selective secretion of H^+ and K^+ and reabsorption of bicarbonate
- (3) Concentration of urine only
- (4) Storage of urine

148. Which of the following acts as an accessory excretory organ in humans?

- (1) Liver only
- (2) Lungs and skin
- (3) Pancreas
- (4) Spleen

149. The globular head of the myosin filament is important because it

- (1) Binds calcium ions
- (2) Acts as an ATPase and forms cross bridges with actin
- (3) Stores oxygen
- (4) Anchors the Z line

- 150.** The pelvic girdle of each side consists of the
 (1) Ilium, ischium and pubis fused at the acetabulum
 (2) Clavicle and scapula
 (3) Sternum and ribs
 (4) Humerus and radius
- 151.** The first seven pairs of ribs, attached directly to the sternum, are called
 (1) Floating ribs
 (2) Vertebrochondral ribs
 (3) True or vertebrosteral ribs
 (4) Cervical ribs
- 152.** In the peripheral nervous system, the myelin sheath around an axon is produced by
 (1) Astrocytes (2) Schwann cells
 (3) Oligodendrocytes (4) Microglia
- 153.** The corpora quadrigemina, four round swellings on the dorsal side, are located in the
 (1) Forebrain (2) Midbrain
 (3) Hindbrain (4) Spinal cord
- 154.** Receptors for taste and smell are
 (1) Photoreceptors (2) Mechanoreceptors
 (3) Chemoreceptors (4) Thermoreceptors
- 155.** Thyroxine differs from most other hormones in that it
 (1) Is a steroid
 (2) Contains iodine and regulates the basal metabolic rate
 (3) Is secreted by the pancreas
 (4) Acts only on bone
- 156.** Secretin and cholecystokinin are hormones secreted by the
 (1) Stomach only
 (2) Mucosa of the small intestine
 (3) Adrenal cortex
 (4) Liver
- 157.** Cortisol produces anti-inflammatory reactions and
 (1) Stimulates the immune response
 (2) Suppresses the immune response
 (3) Lowers blood glucose
 (4) Reduces blood pressure
- 158.** The correct path of sperm transport is
 (1) Rete testis, vasa efferentia, epididymis, vas deferens
 (2) Vas deferens, epididymis, rete testis, urethra
 (3) Epididymis, rete testis, vasa efferentia, vas deferens
 (4) Vasa efferentia, vas deferens, epididymis, rete testis
- 159.** At ovulation, the structure actually released from the Graafian follicle is the
 (1) Primary oocyte (2) Secondary oocyte
 (3) Mature ovum (4) Oogonium
- 160.** Implantation of the blastocyst in the uterine wall normally occurs about
 (1) 1 day after fertilisation
 (2) 7 days after fertilisation
 (3) 21 days after fertilisation
 (4) 3 months after fertilisation
- 161.** By the end of the second month of pregnancy, the foetus
 (1) Has fully developed lungs
 (2) Develops limbs and digits
 (3) Shows first movements and hair on the head
 (4) Is ready for delivery
- 162.** Emergency contraceptives are effective if used within
 (1) 12 hours of coitus (2) 72 hours of coitus
 (3) one week of coitus (4) one month of coitus
- 163.** Amniocentesis, when used legitimately, helps to detect
 (1) The sex of the foetus for selection
 (2) Chromosomal abnormalities and metabolic disorders in the foetus
 (3) The blood group of the mother
 (4) Ovulation time

164. The Reproductive and Child Health Care programmes aim mainly at

- (1) Increasing the birth rate
- (2) Creating awareness and providing facilities for reproductive health
- (3) Restricting medical termination of pregnancy
- (4) Promoting early marriage

165. The two key concepts of Darwinian theory are

- (1) Use and disuse, and inheritance of acquired characters
- (2) Branching descent and natural selection
- (3) Saltation and mutation
- (4) Genetic drift and gene flow

166. Hugo de Vries proposed that evolution proceeds by large, sudden, single-step changes called

- (1) Gradual variations
- (2) Saltation caused by mutation
- (3) Adaptive radiation
- (4) Convergence

167. Fossils, which provide direct evidence of evolution, are found mainly in

- (1) Igneous rocks
- (2) Sedimentary rocks
- (3) Metamorphic rocks
- (4) Volcanic ash only

168. Which of the following is a vestigial organ in humans?

- (1) The femur
- (2) The vermiform appendix
- (3) The heart
- (4) The diaphragm

169. Reproductive isolation between two populations leads to

- (1) Gene flow
- (2) Speciation
- (3) Genetic equilibrium
- (4) Hybridisation

170. The common cold, caused by rhino viruses, infects

- (1) The lungs
- (2) The nose and respiratory passage but not the lungs
- (3) The intestine
- (4) The liver

171. Ringworm is caused by fungi belonging to the genera

- (1) Microsporum, Trichophyton and Epidermophyton
- (2) Candida and Aspergillus
- (3) Entamoeba and Giardia
- (4) Salmonella and Streptococcus

172. The primary lymphoid organs of the human body are

- (1) Spleen and lymph nodes
- (2) Bone marrow and thymus
- (3) Tonsils and appendix
- (4) Peyer's patches and spleen

173. Rheumatoid arthritis is an example of

- (1) An allergy
- (2) An autoimmune disease
- (3) An immunodeficiency
- (4) A viral infection

174. A malignant tumour of the connective tissue such as bone or muscle is called a

- (1) Carcinoma
- (2) Sarcoma
- (3) Leukaemia
- (4) Lymphoma

175. Nicotine present in tobacco stimulates the adrenal medulla to release

- (1) Insulin
- (2) Adrenaline and noradrenaline
- (3) Thyroxine
- (4) Melatonin

176. Restriction endonucleases are described as molecular scissors, while the molecular glue used to join DNA fragments is

- (1) DNA polymerase
- (2) DNA ligase
- (3) Primase
- (4) Helicase

177. A good cloning vector must possess

- (1) Only an origin of replication
- (2) An origin of replication, a selectable marker and suitable restriction sites
- (3) Only antibiotic resistance genes
- (4) A large size for easy handling

178. The biolistic or gene gun method is used to introduce foreign DNA into

- (1) Animal cells only
- (2) Plant cells, by bombardment with DNA coated gold or tungsten particles
- (3) Bacteria only
- (4) Viruses

179. Transgenic mice are used in the biotechnology industry mainly to

- (1) Produce milk in bulk
- (2) Test the safety of vaccines before they are used on humans
- (3) Produce antibiotics
- (4) Digest oil spills

180. The use of bio-resources by multinational companies without authorisation or compensatory payment is called

- (1) Bioremediation
- (2) Biopiracy
- (3) Biofortification
- (4) Bioaugmentation

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>
