

ANSWER KEY & SOLUTIONS**SET 4**

NEET (UG) 2027 PRACTICE EXAMINATION — TEST BOOKLET SET 4

Candidate	Aamirah Fathima	Total Questions	180
Maximum Marks	720	Marking Scheme	+4 / -1 / 0

KEY

1	4	2	2	3	1	4	3	5	2	6	2	7	3	8	2	9	2	10	3
11	2	12	2	13	2	14	3	15	2	16	2	17	2	18	3	19	2	20	1
21	2	22	2	23	2	24	2	25	2	26	2	27	3	28	2	29	2	30	2
31	2	32	1	33	2	34	2	35	2	36	2	37	2	38	2	39	2	40	1
41	2	42	2	43	2	44	2	45	2	46	2	47	3	48	2	49	1	50	1
51	2	52	2	53	1	54	2	55	2	56	2	57	2	58	3	59	2	60	1
61	3	62	3	63	2	64	2	65	1	66	2	67	2	68	3	69	2	70	2
71	2	72	3	73	2	74	2	75	2	76	2	77	2	78	2	79	2	80	2
81	1	82	1	83	2	84	1	85	1	86	2	87	2	88	2	89	3	90	2
91	2	92	3	93	2	94	2	95	2	96	3	97	2	98	1	99	2	100	3
101	2	102	2	103	3	104	2	105	2	106	2	107	2	108	3	109	3	110	2
111	2	112	2	113	2	114	3	115	2	116	2	117	2	118	2	119	2	120	2
121	2	122	2	123	1	124	2	125	2	126	3	127	2	128	3	129	3	130	2
131	2	132	2	133	2	134	2	135	2	136	2	137	2	138	2	139	3	140	1
141	2	142	4	143	4	144	2	145	2	146	2	147	1	148	1	149	2	150	2
151	2	152	2	153	2	154	2	155	2	156	2	157	2	158	1	159	4	160	3
161	2	162	2	163	2	164	2	165	2	166	2	167	2	168	2	169	2	170	2
171	1	172	2	173	2	174	2	175	2	176	3	177	2	178	2	179	2	180	2

PHYSICS – SOLUTIONS

1. (4) Watt

The watt is a unit of power, that is energy per unit time.

[Units & Dimensions]

2. (2) Systematic error

An instrumental zero error shifts every reading in the same direction, so it is systematic.

[Errors & Significant Figures]

3. (1) πr and $2r$

Half the circumference is πr , while the displacement is the diameter $2r$.

[Kinematics]

4. (3) Is independent of the horizontal speed

Vertical and horizontal motions are independent; time depends only on the height.

[Kinematics]

5. (2) Equal to the applied force

Static friction is self-adjusting and just balances the applied force until the limit is reached.

[Laws of Motion]

6. (2) $\sqrt{gr}$

At the top, gravity supplies the centripetal force: $mg = mv^2/r \Rightarrow v = \sqrt{gr}$.

[Laws of Motion]

7. (3) 22 J

$W = F \cdot d = 5 \times 2 + 3 \times 4 = 22 \text{ J}$.

[Work, Energy & Power]

8. (2) Zero

Work by a conservative force depends only on the end points, which coincide for a closed path.

[Work, Energy & Power]

9. (2) Zero

$\tau = rF \sin\theta$ vanishes because the perpendicular distance from the axis is zero.

[Rotational Motion]

10. (3) $(7/5)MR^2$

Parallel axis theorem: $(2/5)MR^2 + MR^2 = (7/5)MR^2$.

[Rotational Motion]

11. (2) $-Gm_1m_2/r$

The negative sign shows the bound nature of the gravitational interaction.

[Gravitation]

12. (2) The station and astronaut are both in free fall with the same acceleration

There is no normal reaction between the astronaut and the floor during free fall.

[Gravitation]

13. (2) Smaller strain and hence a larger Young's modulus

Elasticity is measured by the resistance to deformation, that is by $Y = \text{stress/strain}$.

[Elasticity]

14. (3) 2000 N

Pascal's law gives $F_2 = F_1 \times (A_2/A_1) = 20 \times 100 = 2000 \text{ N}$.

[Fluids]

15. (2) Reynolds number

Flow is generally streamline below $Re \approx 1000$ and turbulent above $Re \approx 2000$.

[Fluids]

16. (2) Decreases

$\lambda_m T = \text{constant}$, so a hotter body radiates most strongly at a shorter wavelength.

[Thermal Properties]

17. (2) No heat engine can have 100% efficiency

Some heat must always be rejected to the sink; complete conversion of heat into work is impossible.

[Thermodynamics]

18. (3) Zero

Internal energy of an ideal gas depends only on temperature, which stays constant.

[Thermodynamics]

19. (2) Inversely proportional to the number density

$\lambda = 1/(\sqrt{2} n \sigma)$, so denser gases have shorter mean free paths.

[Kinetic Theory]

20. (1) $C_p - C_v = R$

Mayer's relation follows from the extra work done in expansion at constant pressure.

[Kinetic Theory]

21. (2) Decreases exponentially with time

The dissipative force makes the amplitude fall off as $e^{(-bt/2m)}$.

[Oscillations]

22. (2) $\sqrt{6}$ times

$T \propto 1/\sqrt{g}$, so a smaller g lengthens the period by a factor of $\sqrt{6}$.

[Oscillations]

23. (2) Longitudinal and cannot be polarised

Air cannot sustain shear, so sound propagates as compressions and rarefactions.

[Waves]

24. (2) Decreases

Relative separation increases, so fewer wavefronts reach the observer per second.

[Waves]

25. (2) Charge exists only as an integral multiple of e

$q = ne$ where n is an integer and $e = 1.6 \times 10^{-19}$ C.

[Electrostatics]

26. (2) $\sigma/2\epsilon_0$ and independent of distance

Gauss's law gives a uniform field on either side of the sheet.

[Electrostatics]

27. (3) 5 μF

Capacitances simply add in parallel.

[Capacitors]

28. (2) Greater than the emf

$V = E + Ir$ when current is driven into the cell.

[Current Electricity]

29. (2) Increases

Increased lattice vibrations shorten the relaxation time of the electrons.

[Current Electricity]

30. (2) $\mu_0 I/4R$

A semicircle contributes half the field of a full loop, $\mu_0 I/2R$.

[Moving Charges & Magnetism]

31. (2) The net current enclosed by the loop

$\oint \mathbf{B} \cdot d\mathbf{l} = \mu_0 I_{\text{enclosed}}$.

[Moving Charges & Magnetism]

32. (1) 0°

The earth's field is horizontal at the magnetic equator and vertical at the poles.

[Magnetism & Matter]

33. (2) $\frac{1}{2}LI^2$

$U = \frac{1}{2}LI^2$, analogous to $\frac{1}{2}CV^2$ for a capacitor.

[Electromagnetic Induction]

34. (2) $NAB\omega$

$\epsilon = NAB\omega \sin \omega t$, so the peak value is $NAB\omega$.

[Electromagnetic Induction]

35. (2) 159 Hz

$f = 1/(2\pi\sqrt{LC}) = 1/(2\pi \times 10^{-3}) \approx 159$ Hz.

[Alternating Current]

36. (2) Reduces current without dissipating power

An ideal inductor is wattless, so no energy is wasted as heat.

[Alternating Current]

37. (2) A time varying electric field

Maxwell added the term $\epsilon_0 d\Phi_E/dt$ to make Ampere's law consistent.

[Electromagnetic Waves]

38. (2) Total internal reflection

Light repeatedly undergoes total internal reflection at the core-cladding boundary.

[Ray Optics]

39. (2) A concave lens

A diverging lens shifts the image from in front of the retina onto it.

[Ray Optics]

40. (1) A source of secondary wavelets

The new wavefront is the forward envelope of these secondary wavelets.

[Wave Optics]

41. (2) Half

$\beta = \lambda D/d$, so β is inversely proportional to the slit separation.

[Wave Optics]

42. (2) The number of photoelectrons emitted per second

Intensity determines the number of photons, not the energy of each photon.

[Dual Nature of Matter]

43. (2) A small dense positively charged nucleus

A few alpha particles bouncing back showed that positive charge is concentrated in a tiny volume.

[Atoms]

44. (2) Reverse bias

Reverse bias makes the fractional change in current with illumination easy to measure.

[Semiconductors]

45. (2) Electrons and holes recombine near the junction under forward bias

Recombination releases energy as photons of energy nearly equal to the band gap.

[Semiconductors]

46. (2) 0.5

One mole of any gas occupies 22.4 L at STP.

[Some Basic Concepts]

47. (3) 35%

Two N atoms give 28 out of a molar mass of 80 $\Rightarrow$ 35%.

[Some Basic Concepts]

48. (2) Isobars

For example ^{14}C and ^{14}N are isobars.

[Structure of Atom]

49. (1) $\Delta x \cdot \Delta p \geq h/4\pi$

Position and momentum cannot both be determined with arbitrary precision.

[Structure of Atom]

50. (1) $\text{Na} > \text{Mg} > \text{Al} > \text{Si}$

Atomic radius decreases across a period as effective nuclear charge increases.

[Classification & Periodicity]

51. (2) Diagonal relationship

The first element of a group resembles the second element of the next group.

[Classification & Periodicity]

52. (2) sp^3d , trigonal bipyramidal

Five bond pairs around phosphorus give a trigonal bipyramidal shape with axial bonds longer.

[Chemical Bonding]

53. (1) $\text{C}\equiv\text{C} < \text{C}=\text{C} < \text{C}-\text{C}$

More shared electron pairs pull the nuclei closer, so a triple bond is shortest.

[Chemical Bonding]

54. (2) Resonance

The real structure is a resonance hybrid of three equivalent canonical forms.

[Chemical Bonding]

55. (2) Intramolecular hydrogen bonding

Chelation within the molecule prevents association between molecules.

[Chemical Bonding]

56. (2) Zero

$\Delta G = 0$ defines the position of equilibrium at constant T and P.

[Thermodynamics]

57. (2) The reaction is always between H^+ and OH^- to form water

Both are completely ionised, so the only reaction is $\text{H}^+ + \text{OH}^- \rightarrow \text{H}_2\text{O}$.

[Thermodynamics]

58. (3) Does not shift the equilibrium but helps it to be attained faster

A catalyst speeds up forward and backward reactions equally.

[Equilibrium]

59. (2) 2

$[\text{H}^+] = 10^{-2} \text{ M} \Rightarrow \text{pH} = 2$.

[Equilibrium]

60. (1) An acid because it accepts an electron pair

The electron-deficient boron atom acts as an electron pair acceptor.

[Equilibrium]

61. (3) Zinc is the reducing agent

Zn loses electrons, so it is oxidised and acts as the reducing agent.

[Redox Reactions]

62. (3) Free radicals

Each atom retains one electron of the shared pair.

[Organic Chemistry – Basic Principles]

63. (2) Position isomers

They differ only in the position of the hydroxyl group on the same chain.

[Organic Chemistry – Basic Principles]

64. (2) Crystallisation

The impure solid is dissolved hot and allowed to crystallise on cooling.

[Organic Chemistry – Basic Principles]

65. (1) Ethane

Sabatier-Senderens reduction adds hydrogen across the double bond.

[Hydrocarbons]

66. (2) Cold dilute alkaline KMnO_4

The purple colour is discharged as the alkene is converted into a vicinal diol.

[Hydrocarbons]

67. (2) Benzoic acid

The side chain is oxidised completely to the carboxylic acid.

[Hydrocarbons]

68. (3) Molality

Molality is based on the mass of solvent, which does not change with temperature.

[Solutions]

69. (2) The molality of the solution

$\Delta T_f = K_f m$, a colligative property.

[Solutions]

70. (2) Maintain electrical neutrality and complete the circuit

It allows ion migration between the half cells without mixing the solutions.

[Electrochemistry]

71. (2) Applying Kohlrausch's law of independent migration of ions

Λ_m° values of strong electrolytes are combined to obtain that of the weak electrolyte.

[Electrochemistry]

72. (3) 4

Overall order is two, so the rate becomes $2 \times 2 = 4$ times.

[Chemical Kinetics]

73. (2) Roughly doubles the rate

The temperature coefficient of most reactions is about 2 to 3.

[Chemical Kinetics]

74. (2) 1.73 BM

$\mu = \sqrt{n(n+2)}$ with $n = 1$ gives $\sqrt{3} = 1.73$ BM.

[d- and f-Block Elements]

75. (2) Strong metallic bonding involving d electrons

Unpaired d electrons contribute to interatomic bonding in the metallic lattice.

[d- and f-Block Elements]

76. (2) Charge transfer from oxygen to manganese

Mn in MnO_4^- is d^0 , so the colour must come from a ligand to metal charge transfer.

[d- and f-Block Elements]

77. (2) Coordination number

Primary valency is satisfied by negative ions and secondary valency by ligands.

[Coordination Compounds]

78. (2) d^2sp^3 , 3

Cr^{3+} is $3d^3$; the three electrons stay unpaired in t_{2g} and inner d orbitals are used.

[Coordination Compounds]

79. (2) cis-[Pt(NH₃)₂Cl₂]

Only the cis isomer of diamminedichloridoplatinum(II) is therapeutically active.

[Coordination Compounds]

80. (2) A racemic mixture

The planar carbocation intermediate can be attacked from either face.

[Haloalkanes & Haloarenes]

81. (1) NaI in dry acetone

Sodium chloride precipitates in acetone, driving the equilibrium towards the iodide.

[Haloalkanes & Haloarenes]

82. (1) A primary alcohol

Formaldehyde is the only aldehyde that yields a primary alcohol with RMgX .

[Alcohols, Phenols & Ethers]

83. (2) Salicylaldehyde

Treatment with CHCl_3 and aqueous NaOH introduces a $-\text{CHO}$ group at the ortho position.

[Alcohols, Phenols & Ethers]

84. (1) Ethanal and propanone

Aliphatic aldehydes give a red precipitate of Cu_2O ; ketones do not react.

[Aldehydes, Ketones & Carboxylic Acids]

85. (1) 3-Hydroxybutanal

The β -hydroxy aldehyde formed can lose water on heating to give but-2-enal.

[Aldehydes, Ketones & Carboxylic Acids]

86. (2) p-Nitrobenzoic acid > benzoic acid > p-methoxybenzoic acid

Electron withdrawing $-\text{NO}_2$ stabilises the carboxylate; electron releasing $-\text{OCH}_3$ destabilises it.

[Aldehydes, Ketones & Carboxylic Acids]

87. (2) The lone pair on nitrogen is delocalised into the benzene ring

Resonance reduces the availability of the nitrogen lone pair for protonation.

[Amines]

88. (2) An orange azo dye

Coupling occurs at the para position to give an orange coloured azo compound.

[Amines]

89. (3) Uracil

RNA has ribose sugar and uracil in place of deoxyribose and thymine.

[Biomolecules]

90. (2) Secondary and tertiary structure

Hydrogen bonds and other weak interactions break, but the covalent backbone survives.

[Biomolecules]

91. (2) Herbarium

Each herbarium sheet carries a label giving date, place of collection and family.

[The Living World]

92. (3) Vibrio

Bacteria are classified by shape as coccus, bacillus, vibrio and spirillum.

[Biological Classification]

93. (2) Have a protein-rich pellicle and are mixotrophic

They photosynthesise in sunlight but feed heterotrophically in its absence.

[Biological Classification]

94. (2) Coenocytic aseptate hyphae and zygospores

Phycomycetes have aseptate multinucleate hyphae and produce zygospores sexually.

[Biological Classification]

95. (2) Gametophyte

The sporophyte is attached to and dependent on the photosynthetic gametophyte.

[Plant Kingdom]

96. (3) Wind

Gymnosperms produce large amounts of light, dry pollen carried by air currents.

[Plant Kingdom]

97. (2) Dicot leaves

Monocots typically show parallel venation, with Smilax as an exception.

[Morphology of Flowering Plants]

98. (1) Trimerous with a superior ovary

The perianth of six tepals in two whorls and a tricarpeal superior ovary are typical.

[Morphology of Flowering Plants]

99. (2) Non-endospermic

The food reserve is stored in the cotyledons, so the endosperm is consumed during development.

[Morphology of Flowering Plants]

100. (3) Intrafascicular plus newly formed interfascicular cambium

Cells of the medullary rays become meristematic and join the existing cambial strips.

[Anatomy of Flowering Plants]

101. (2) Gaseous exchange

These lens-shaped openings in the periderm permit exchange of gases with the atmosphere.

[Anatomy of Flowering Plants]

102. (2) Living cells with cellulose and pectin thickening at the corners

It gives mechanical support with flexibility to young stems and petioles.

[Anatomy of Flowering Plants]

103. (3) Rudolf Virchow

Virchow's addition completed the cell theory proposed by Schleiden and Schwann.

[Cell: The Unit of Life]

104. (2) Hydrolytic enzymes active at acidic pH

Their acid hydrolases can digest carbohydrates, proteins, lipids and nucleic acids.

[Cell: The Unit of Life]

105. (2) 9 + 0 with a cartwheel structure

Nine peripheral triplets and no central tubule, with a proteinaceous hub.

[Cell: The Unit of Life]

106. (2) Peptide bond

The sequence of amino acids joined by peptide bonds is the primary structure.

[Biomolecules]

107. (2) Both hydrophilic head and hydrophobic tail regions

This dual nature makes them form bilayers in an aqueous environment.

[Biomolecules]

108. (3) G₀ or quiescent stage

Such cells may re-enter the cycle if suitably stimulated.

[Cell Cycle & Cell Division]

109. (3) Diakinesis

Diakinesis marks the end of prophase I, with the nucleolus disappearing.

[Cell Cycle & Cell Division]

110. (2) It is the reaction centre pigment that finally traps and converts light energy

Accessory pigments absorb light and transfer the energy to chlorophyll a.

[Photosynthesis]

111. (2) Water to PS II to PS I to NADP⁺

This Z-scheme arrangement produces ATP, NADPH and oxygen.

[Photosynthesis]

112. (2) Carboxylation, reduction, regeneration

CO₂ is fixed to RuBP, the resulting PGA is reduced, and RuBP is regenerated.

[Photosynthesis]

113. (2) 10% of full sunlight

Beyond this, light is no longer the limiting factor.

[Photosynthesis]

114. (3) Oxygen

Oxygen combines with electrons and protons to form water.

[Respiration in Plants]

115. (2) Involves both catabolism and anabolism

Intermediates are withdrawn for the synthesis of fatty acids and amino acids.

[Respiration in Plants]

116. (2) Sigmoid

A lag phase is followed by log and stationary phases, giving an S-shaped curve.

[Plant Growth & Development]

117. (2) Dedifferentiation

Interfascicular cambium and cork cambium arise by dedifferentiation.

[Plant Growth & Development]

118. (2) Chalazal one

Three of the four megaspores degenerate and the chalazal one forms the embryo sac.

[Sexual Reproduction in Flowering Plants]

119. (2) Parthenium

Carrot grass, introduced with imported wheat, causes pollen allergy and asthma.

[Sexual Reproduction in Flowering Plants]

120. (2) Free nuclear endosperm

The surrounding white kernel is the cellular endosperm formed later.

[Sexual Reproduction in Flowering Plants]

121. (2) Bisexual flowers

The anthers must be removed before dehiscence to prevent self-pollination.

[Sexual Reproduction in Flowering Plants]

122. (2) Test cross

A test cross reveals the genotype of the dominant phenotype.

[Principles of Inheritance]

123. (1) Pleiotropy

The mutant gene causes mental retardation and reduced hair and skin pigmentation.

[Principles of Inheritance]

124. (2) Sutton and Boveri

They noted that the behaviour of chromosomes parallels the behaviour of Mendel's factors.

[Principles of Inheritance]

125. (2) 47, XXY

The affected male shows gynaecomastia and is sterile.

[Principles of Inheritance]

126. (3) A = T and G = C

Purine and pyrimidine ratios are equal because of complementary base pairing.

[Molecular Basis of Inheritance]

127. (2) 200 base pairs

About 200 bp of DNA helix is wrapped around a histone octamer.

[Molecular Basis of Inheritance]

128. (3) Splicing

hnRNA also undergoes capping with methyl guanosine triphosphate and poly-A tailing.

[Molecular Basis of Inheritance]

129. (3) 3164.7 million base pairs

The human genome contains roughly 3.2 billion base pairs.

[Molecular Basis of Inheritance]

130. (2) Brood parasitism

The eggs resemble those of the host in size and colour, so they are not detected.

[Organisms & Populations]

131. (2) Pug marks and faecal pellets

Indirect indicators are used where direct counting is impractical.

[Organisms & Populations]

132. (2) 170 billion tons

Of this, oceans contribute only about 55 billion tons despite their vast area.

[Ecosystem]

133. (2) Sedimentary cycle

The reservoir is rock, unlike carbon and nitrogen whose reservoir is the atmosphere.

[Ecosystem]

134. (2) Paul Ehrlich

Loss of key species, like rivets in the wings, can be dangerously destabilising.

[Biodiversity & Conservation]

135. (2) 1.7 to 1.8 million

Robert May places the global species diversity at about 7 million in total.

[Biodiversity & Conservation]

136. (2) Cnidaria

Sponges show only a cellular level; cnidarians have cells arranged into tissues.

[Animal Kingdom]

137. (2) Radial symmetry

Their larvae are bilaterally symmetrical but adults become radially symmetrical.

[Animal Kingdom]

138. (2) Dry cornified skin with epidermal scales

They lack skin glands, and lay shelled eggs on land.

[Animal Kingdom]

139. (3) Birds

Hollow bones reduce weight and air sacs supplement respiration during flight.

[Animal Kingdom]

140. (1) Blood

Blood is a fluid connective tissue with plasma as its matrix.

[Structural Organisation in Animals]

141. (2) Three chambered

Two atria and one ventricle, along with a sinus venosus and conus arteriosus.

[Structural Organisation in Animals]

142. (4) Residual volume

Residual volume is about 1100 to 1200 mL and cannot be expelled.

[Breathing & Exchange of Gases]

143. (4) 97%

Only about 3% of oxygen is carried dissolved in plasma.

[Breathing & Exchange of Gases]

144. (2) 0.8 s

At 72 beats per minute each cycle lasts roughly 0.8 second.

[Body Fluids & Circulation]

145. (2) 1.5 to 3.5 lakh per mm³

A count below this range can lead to clotting disorders.

[Body Fluids & Circulation]

146. (2) Passes through the heart twice per complete circuit

Pulmonary and systemic circuits keep oxygenated and deoxygenated blood separate.

[Body Fluids & Circulation]

147. (1) Podocytes

Blood is filtered so finely through these slits that the process is called ultrafiltration.

[Excretory Products]

148. (1) Uremia

Uremia is highly harmful and may be treated by haemodialysis.

[Excretory Products]

149. (2) Non-striated and involuntary

They occur in the walls of hollow visceral organs and are not under conscious control.

[Locomotion & Movement]

150. (2) Abundant myoglobin and mitochondria, relying on aerobic respiration

The high myoglobin content gives them their red colour and fatigue resistance.

[Locomotion & Movement]

151. (2) A genetic disorder causing progressive degeneration of skeletal muscle

The progressive weakening of skeletal muscles has a genetic basis.

[Locomotion & Movement]

152. (2) Influx of Na⁺

Sodium channels open and Na⁺ rushes in, reversing the membrane polarity.

[Neural Control & Coordination]

153. (2) Hypothalamus

The hypothalamus contains centres controlling these urges and also secretes hormones.

[Neural Control & Coordination]

154. (2) The optic nerve leaves the eye and photoreceptors are absent

The macula lutea with its fovea, by contrast, has the greatest density of cones.

[Neural Control & Coordination]

155. (2) Hypothalamic releasing and inhibiting hormones

Hypothalamic neurohormones reach the adenohypophysis through a portal circulation.

[Chemical Coordination]

156. (2) Pineal gland

It also influences metabolism, pigmentation and the menstrual cycle.

[Chemical Coordination]

157. (2) Stimulate glycogenolysis and raise blood glucose

Glucagon is a hyperglycemic hormone with effects opposite to those of insulin.

[Chemical Coordination]

158. (1) Promote reabsorption of Na⁺ and water

The mineralocorticoid also promotes excretion of K⁺ and phosphate.

[Chemical Coordination]

159. (4) Bartholin's gland

Bartholin's glands are located near the vaginal opening in females.

[Human Reproduction]

160. (3) 15 to 28

The luteal or secretory phase follows ovulation, when the corpus luteum is active.

[Human Reproduction]

161. (2) Golgi apparatus

It contains hydrolytic enzymes that help the sperm penetrate the ovum.

[Human Reproduction]

162. (2) Protect the foetus from mechanical shock

Nutrition and gas exchange are functions of the placenta.

[Human Reproduction]

163. (2) Cutting and tying the vas deferens

It is a terminal method of contraception performed on the male.

[Reproductive Health]

164. (2) A rapid decline in maternal and infant mortality rates

Better health facilities lowered MMR and IMR while birth rates stayed high.

[Reproductive Health]

165. (2) Protect against sexually transmitted infections

They form a barrier to the exchange of body fluids.

[Reproductive Health]

166. (2) Oparin and Haldane

They suggested that the first form of life came from pre-existing non-living organic molecules.

[Evolution]

167. (2) Analogy

A modified root and a modified stem perform the same storage function.

[Evolution]

168. (2) Evolution occurring in the present time by natural selection

Resistant variants survive and multiply when the antibiotic is applied.

[Evolution]

169. (2) Australopithecus, Homo habilis, Homo erectus, Homo sapiens

Brain capacity increased progressively along this line.

[Evolution]

170. (2) Karl Ernst von Baer

Von Baer showed that embryos never pass through the adult stages of other animals.

[Evolution]

171. (1) Entamoeba histolytica

Houseflies act as mechanical carriers, transmitting the parasite to food.

[Human Health & Disease]

172. (2) Severe problems in respiration

Streptococcus pneumoniae and Haemophilus influenzae are common causative agents.

[Human Health & Disease]

173. (2) Cell-mediated immunity involving T lymphocytes

The graft is recognised as foreign by the recipient's T cells.

[Human Health & Disease]

174. (2) Alpha interferon

Biological response modifiers such as α-interferon help the immune system destroy tumours.

[Human Health & Disease]

175. (2) Increase muscle strength and aggressiveness

Their use causes serious side effects including masculinisation and kidney damage.

[Human Health & Disease]

176. (3) The strain of the bacterium

E from Escherichia, co from coli, R from the strain RY13 and I for the first enzyme isolated.

[Biotechnology - Principles]

177. (2) A selectable marker

Antibiotic resistance genes commonly serve as selectable markers in *E. coli*.

[Biotechnology - Principles]

178. (2) Downstream processing

It is followed by formulation with preservatives and clinical trials.

[Biotechnology - Principles]

179. (2) Polymerase chain reaction

PCR amplifies even minute amounts of viral nucleic acid before symptoms appear.

[Biotechnology - Applications]

180. (2) GEAC

The Genetic Engineering Approval Committee also assesses the safety of introducing GM organisms.

[Biotechnology - Applications]