ICSE Biology (Science Paper 3)

Complete Chapter-wise Question Bank (2023 - 2027)

> **Source Key & Guide**
> • B26 / B25 / B24 / B23 = Board papers (2026 to 2023)
> • S27 / S26 / S25 / S24 / S23 = Specimen papers (2027 to 2023)
> • Note: Marks are shown in [ ]. '[1 of 5]' denotes one part of a 5-mark question. Diagram references are in brackets.

1. CIRCULATORY SYSTEM

MCQs / Assertion-Reason

1. **[B26 Q1(ii)]** During ventricular systole, the atrioventricular valves (P) ___ and the semilunar valves (Q) ___. (a) P close, Q open (b) P close, Q close (c) P open, Q close (d) P open, Q open **[1]**

2. **[S25 Q1(iv)]** Same question as above (repeated in the 2025 specimen). **[1]**

3. **[B26 Q1(x)]** Correct sequence of blood flow in pulmonary and systemic circulation? (a) RA→RV→Lungs→LA→LV→Body (b) LV→LA→Body→RA→RV→Lungs (c) LV→LA→Lungs→RV→RA→Body (d) RA→RV→Body→LA→LV→Lungs **[1]**

4. **[S27 Q1(x)]** Path of blood flow during pulmonary circulation? (a) Right auricle, Right ventricle, Pulmonary artery, Lungs, Pulmonary veins, Left auricle (b) Left auricle, Left ventricle, Pulmonary veins, Lungs, Pulmonary artery, Right auricle (c) Left auricle, Left ventricle, Aorta, Tissues, Vena cava, Right auricle (d) Right auricle, Right ventricle, Pulmonary veins, Lungs, Pulmonary artery, Left auricle **[1]**

5. **[B26 Q1(vi)]** A: Leukoderma is the biological term for blood cancer. R: An abnormal increase in the number of WBCs causes blood cancer. **[1]**

6. **[S27 Q1(xii)]** A: Pericardial fluid is present between the heart and pericardium. R: The human heart has four chambers. **[1]**

7. **[S24 Q1(v)]** Oxygenated blood to the heart is supplied by: (a) Hepatic artery (b) Coronary artery (c) Renal artery (d) Pulmonary artery **[1]**

8. **[B24 Q1(viii)]** If a person has a heart attack, what must be done immediately? P. Loosen clothing Q. Lie down in an airy room R. Rush to hospital S. Engage in conversation. (a) P and Q (b) P and S (c) R and S (d) P, Q and R **[1]**

9. **[S26 Q1(i)]** Allen's blood report showed an abnormal decrease in RBCs. He is suffering from: (a) Polycythemia (b) Erythropenia (c) Glycosuria (d) Haemophilia **[1]**

10. **[S26 Q1(v)]** [Diagram of a Neutrophil] The function is: (a) secreting hormone (b) transporting food (c) phagocytosis (d) producing antibodies **[1]**

11. **[B23 Q1(iii)]** The heart sound 'Dup' is produced when: (a) Semilunar valves open (b) Atrioventricular valves close (c) Semilunar valves close (d) Atrioventricular valves open **[1]**

12. **[B23 Q1(vii)]** The life span of an RBC is: (a) 120 days (b) 220 days (c) 20 days (d) 2 weeks **[1]**

13. **[B23 Q1(xiv)]** Oxygenated blood to the liver is supplied by: (a) Hepatic artery (b) Hepatic vein (c) Inferior vena cava (d) Hepatic portal vein **[1]**

14. **[S23 Q1(i)]** A muscular wall is absent in: (a) Capillary (b) Arteriole (c) Venule (d) Vein **[1]**

Name / Fill in the blanks / Location

15. **[B25 Q2(ii)]** [Diagram of human heart] Fill in the blanks: heart enclosed by membrane (a); ventricles give rise to two large vessels (b) and (c); flaps of cuspid valves kept in position by (d); (e) arteries supply oxygenated blood to the heart walls. **[5]**

16. **[S26 Q2(ii)]** Same heart passage as above, with choices in brackets (Pericardium/Pleura, Pulmonary vein/Pulmonary artery, Aorta/Venacava, Chordae tendinae/Endometrium, Hepatic/Coronary). **[5]**

17. **[S24 Q2(i)(a)]** Name the respiratory pigment in erythrocytes. **[1 of 5]**

18. **[S25 Q2(iv)(c)]** Name the smallest blood vessels in the human body. **[1 of 5]**

19. **[B23 Q2(v)(d)]** State the exact location of Papillary muscles. **[1 of 5]**

20. **[S23 Q2(v)(c)]** State the exact location of Chordae tendineae. **[1 of 5]**

Odd one out / Sequence

21. **[B26 Q2(iii)(d)]** Cervix, Chordae Tendinea, Papillary Muscles, Sinoatrial node **[1 of 5]**

22. **[B24 Q2(iv)(a)]** Prothrombin, Thrombin, Fibrinogen, Albumin **[1 of 5]**

23. **[B24 Q2(iv)(b)]** Tonsils, Glomerulus, Spleen, Lymph nodes **[1 of 5]**

24. **[B24 Q2(iv)(c)]** Neutrophils, Basophils, Monocytes, Eosinophils **[1 of 5]**

25. **[B24 Q2(iv)(e)]** Pulmonary artery, Renal artery, Coronary artery, Hepatic artery **[1 of 5]**

26. **[S27 Q2(iii)(a)]** Neutrophil, Monocyte, Eosinophil, Basophil **[1 of 5]**

27. **[S27 Q2(iii)(d)]** Haemoglobin, Fibrin, Prothrombin, Fibrinogen **[1 of 5]**

28. **[B25 Q2(iii)(b)]** Arrange: Hepatic portal vein, Stomach, Hepatic vein, Liver **[1 of 5]**

29. **[S25 Q2(iii)(e)]** Arrange: Lungs, Right auricle, Inferior venacava, Pulmonary Artery **[1 of 5]**

30. **[S24 Q2(ii)(c)]** Arrange: Fibrin, Thrombin, Fibrinogen, Platelets **[1 of 5]**

31. **[S23 Q2(ii)(c)]** Arrange: Pulmonary Vein, Left Ventricle, Aorta, Left auricle **[1 of 5]**

Short answers / Diagrams

32. **[B26 Q5(i)]** RBCs do not have nuclei. Discuss its advantage. **[1]**

33. **[B24 Q8(iv)]** Why are RBCs efficient in their functions though they lack nucleus and mitochondria? **[2]**

34. **[B24 Q5(iv)]** Give the exact location of (a) Pericardium (b) Bicuspid valve. **[2]**

35. **[B24 Q6(i)]** Define the term Diapedesis. **[1]**

36. **[B24 Q6(iii)]** Carbon monoxide is dangerous when inhaled in excess. Comment on the statement. **[2]**

37. **[B24 Q7(iii)]** Mention two structural differences between an artery and a vein. **[2]**

38. **[S24 Q7(iii)]** State two structural differences between an artery and vein. **[2]**

39. **[B24 Q8(ii)(a)]** Name the mineral element required for clotting of blood. **[1 of 2]**

40. **[B25 Q4(ii)]** Name the white blood cells that (a) show phagocytosis (b) produce antibodies. **[2]**

41. **[S25 Q5(iv)]** Write any two functions of Lymph. **[2]**

42. **[B23 Q3(ii)]** Mention any two functions of blood. **[2]**

43. **[S23 Q5(ii)]** What is the significance of the Hepatic Portal Vein? **[2]**

44. **[S26 Q3(v)]** Draw a neat, labelled diagram of a cross section of an Artery and a Vein. **[3]**

45. **[S23 Q7(v)]** Draw neat, labelled diagrams showing the cross sections of an Artery and a Vein. **[3]**

46. **[B23 Q8(v)]** [Diagram depicting human heart during a specific phase]: (a) Which part of the heart is in the contraction phase? (b) Give a suitable reason to justify your answer. (c) Distinguish between Systole and Diastole. **[3]**

47. **[S24 Q8(v)]** [Diagram of human blood smear, parts 1 to 4] (a) One structural difference between 1 and 2. (b) Function of part 3. (c) Name the part labelled 4. **[3]**

48. **[S27 Q8(v)]** Draw a neat, labelled diagram of a human blood smear. **[3]**

2. EXCRETORY SYSTEM

MCQs / Assertion-Reason

1. **[B26 Q1(xii)]** A person with kidney failure has proteins in the urine. This condition is called: (a) Haematuria (b) Glycosuria (c) Albuminuria (d) Anaemia **[1]**

2. **[S25 Q1(i)]** The Loops of Henle lie in: (a) Renal Cortex (b) Renal Medulla (c) Renal Pelvis (d) Renal Artery **[1]**

3. **[S25 Q1(xi)]** A: We urinate more in summer. R: Sweat glands are more active in summer. **[1]**

4. **[S24 Q1(vi)]** A: There is frequent urination in summer than in winter. R: In summer we lose a lot of water as sweat, so the kidneys reabsorb more water. Hence, urine formed is less in summer than in winter. **[1]**

5. **[S27 Q1(ii)]** Rohan felt dizzy while playing cricket on a hot afternoon and was advised oral rehydration solution. Most likely reason? (a) Excessive urination (b) Asphyxiation (c) Low blood glucose level (d) Excessive perspiration **[1]**

6. **[S27 Q1(iv)]** Level of urea in the two blood vessels after a protein meal: (a) Renal Artery High; Renal Vein High (b) Renal Artery High; Renal Vein Low (c) Both Low (d) Renal Artery Low; Renal Vein High **[1]**

7. **[S27 Q1(v)]** A patient suffering with severe cholera: (a) passes very little urine due to severe dehydration (b) passes excessive urine due to kidney overactivity (c) has blood in the urine as the first symptom (d) produces normal amounts of urine despite severe fluid loss **[1]**

8. **[S27 Q1(viii)]** [Nephron diagram, parts 1 to 7] Which parts of the nephron are present in the renal cortex and renal medulla? (a) Cortex 1,2,3; Medulla 4,5,6,7 (b) Cortex 1,2,3,4,5; Medulla 6,7 (c) Cortex 4,5,6,7; Medulla 1,2,3 (d) Cortex 1,2,3,4; Medulla 5,6,7 **[1]**

9. **[B23 Q1(ix)]** The pale yellow colour of normal human urine is due to the pigment: (a) Melanin (b) Anthocyanin (c) Urochrome (d) Haemoglobin **[1]**

10. **[S23 Q1(xv)]** Urine is carried from the kidney to the urinary bladder by: (a) Uterus (b) Urethra (c) Umbilical cord (d) Ureter **[1]**

Name the following / Sequence / Odd one out

11. **[B24 Q2(i)(d)]** The main nitrogenous waste formed in the body. **[1 of 5]**

12. **[S24 Q2(i)(d)]** The duct which carries urine from the urinary bladder to outside the body. **[1 of 5]**

13. **[S23 Q2(i)(b)]** Name the knot-like mass of blood capillaries in Bowman's capsule. **[1 of 5]**

14. **[B26 Q2(iii)(c)]** Urochrome, Urea, Uric acid, Nucleic acid **[1 of 5]**

15. **[S26 Q2(iii)(d)]** Ureter, Urethra, Uterus, Renal Pelvis **[1 of 5]**

16. **[S24 Q2(iv)(b)]** Renal pelvis, Renal artery, Renal Cortex, Renal medulla **[1 of 5]**

17. **[S24 Q2(iv)(c)]** Urochrome, Urea, Keratin, Uric acid **[1 of 5]**

18. **[B23 Q2(iv)(c)]** Uterus, Urethra, Urinary bladder, Ureter **[1 of 5]**

19. **[B24 Q2(ii)(d)]** Arrange: Loop of Henle, Distal convoluted tubule, Bowman's Capsule, Proximal convoluted tubule **[1 of 5]**

20. **[S25 Q2(iii)(b)]** Arrange: Urethra, Urinary bladder, Ureter, Kidney **[1 of 5]**

21. **[B26 Q2(v)]** [Kidney L.S. with Renal Medulla, Renal Artery, Renal Vein, Renal Cortex, Pelvis, Ureter] Match each structure with its function: (a) Has Malpighian capsules (b) Carries oxygenated blood (c) Transports urine to urinary bladder (d) Has Henle's loops (e) Carries deoxygenated blood (f) Receives urine which flows into ureter. Example: Pelvis – (f) **[5]**

Short answers / Diagrams

22. **[B24 Q3(iii)]** Differentiate between Afferent arteriole and Efferent arteriole (diameter). **[2]**

23. **[B24 Q8(i)]** Define the term ultrafiltration. **[1]**

24. **[B25 Q5(i)]** What is Micturition? Explain. **[1]**

25. **[B25 Q8(i)]** Explain the term Excretion. **[1]**

26. **[S26 Q4(i)]** What is Excretion? **[1]**

27. **[S23 Q5(i)]** Define Excretion. **[1]**

28. **[B25 Q8(ii)]** State the difference between Nephron and Neuron. **[2]**

29. **[S25 Q5(iii)]** State the difference between Micturition and Parturition. **[2]**

30. **[S26 Q7(iv)]** Mention the regions of the kidney where we can find glomerulus and Henle's loop. **[2]**

31. **[B23 Q7(ii)]** Renal cortex has a dotted appearance and Renal medulla has a striped appearance. Explain. **[2]**

32. **[S25 Q8(v)]** Draw a neat, labelled diagram of a Malpighian Capsule. **[3]**

33. **[B23 Q6(v)]** Draw a neat, labelled diagram of a Malpighian Capsule. **[3]**

34. **[S23 Q5(v)]** Draw a neat, labelled diagram to show the internal structure of a human kidney. **[3]**

3. NERVOUS SYSTEM

MCQs / Assertion-Reason

1. **[B26 Q1(ix)]** Bharat missed the school bus; this stimulated the sympathetic nerves, resulting in: (a) Constriction of coronary arteries (b) Muscle relaxation (c) Decrease in respiration rate (d) Bronchodilation **[1]**

2. **[B26 Q1(xi)]** After a head injury, Karan's pupils lost the capacity to constrict in bright light. Which structure was damaged? (a) Suspensory ligaments (b) Medulla oblongata (c) Eye lens (d) Eye lid **[1]**

3. **[B24 Q1(xiii)]** A: Sympathetic nervous system prepares the body for violent action against abnormal conditions. R: Sympathetic nervous system accelerates heartbeat. **[1]**

4. **[B25 Q1(xi)]** A: Arachnoid layer helps in speeding up the transmission of nerve impulses along the axons. R: Axon endings at the synapse secrete acetylene (as printed). **[1]**

5. **[S25 Q1(v)]** The two cerebral hemispheres are joined by a sheet of fibres called: (a) Pons (b) Corpus luteum (c) Hypothalamus (d) Corpus callosum **[1]**

6. **[S24 Q1(xv)]** Lata looked on either side of the road and then crossed. Which are involved? 1. Cerebrum 2. Cerebellum 3. Skeletal muscles 4. Medulla Oblongata. (a) Only 3 (b) Only 1 and 3 (c) Only 1, 3 and 4 (d) Only 1, 2 and 3 **[1]**

7. **[S26 Q1(viii)]** Reflex actions provide a survival advantage because they: (a) are controlled by the cerebrum (b) are controlled by the medulla oblongata (c) require no conscious thought, allowing rapid responses (d) always involve the spinal cord **[1]**

8. **[S27 Q1(ix)]** Tina's mouth started watering thinking of her favourite food. This is a/an: (a) voluntary action (b) somatic reflex (c) acquired reflex (d) natural reflex **[1]**

9. **[B23 Q1(x)]** Stimulation of the nerves of the sympathetic nervous system: (a) Accelerates heartbeat (b) Constricts pupil of eyes (c) Increases peristalsis (d) Retards heartbeat **[1]**

10. **[S23 Q1(xii)]** The outermost covering of the brain is: (a) Arachnoid (b) Pia mater (c) Pericardium (d) Dura mater **[1]**

Name / Sequence / Odd One Out / Location

11. **[S26 Q2(i)(e)]** The fluid present between the layers of meninges. **[1 of 5]**

12. **[S27 Q2(i)(e)]** The neurotransmitter stored in the axon endings of neurons. **[1 of 5]**

13. **[B25 Q2(iv)(b)]** The part of the brain that regulates the peristaltic movement of the alimentary canal. **[1 of 5]**

14. **[S24 Q2(i)(e)]** The collective term for the protective membranes of the brain. **[1 of 5]**

15. **[S25 Q2(ii)]** [T.S. of spinal cord] Fill in the blanks: spinal cord is part of the (a) Nervous System; grey matter consists of (b); white matter consists of (c); concerned with (d) actions below the neck; (e) is the bony structure that protects it. **[5]**

16. **[S26 Q2(iii)(b)]** Pons, Epidermis, Xylem, Phloem **[1 of 5]**

17. **[B25 Q2(iii)(c)]** Arrange: Cyton, Dendrites, Synaptic cleft, Axon endings **[1 of 5]**

18. **[B24 Q2(ii)(c)]** Arrange: Effector, Receptor, Motor neuron, Sensory neuron **[1 of 5]**

19. **[B23 Q2(ii)(c)]** Arrange: Receptor, Response, Effector, Spinal Cord **[1 of 5]**

20. **[S23 Q2(iv)(c)]** Odd one out: Spinal cord, Cerebrum, Pons, Cerebellum **[1 of 5]**

21. **[B23 Q2(v)(b)]** State the exact location of Dura mater. **[1 of 5]**

22. **[S23 Q2(v)(b)]** State the exact location of Corpus callosum. **[1 of 5]**

Short answers

23. **[B24 Q4(v)]** Mohan shooting a basketball: (a) Which part of the brain helps him concentrate? (b) Sense organ that helps gauge distance between ball and basket? (c) Part of the brain that co-ordinates all voluntary muscles? **[3]**

24. **[S26 Q3(iii)]** Ayush focusing on a carrom match: (a) Which part of the brain helps him focus? (b) Part of the brain that co-ordinates his muscles while using the striker? **[2]**

25. **[B24 Q5(i)]** Name the type of nerve which has the fibres of both sensory and motor neurons. **[1]**

26. **[S24 Q4(i)]** Mention the exact location of Corpus callosum. **[1]**

27. **[S24 Q8(iii)]** Mention one function each for Cerebrum and Cerebellum. **[2]**

28. **[B23 Q7(iii)]** What are two functions of the Cerebellum? **[2]**

29. **[S23 Q6(iii)]** State the function of Medulla Oblongata with a suitable example. **[2]**

30. **[B26 Q4(ii)]** How are the Cytons and Axons of neurons arranged in (a) Cerebrum (b) Spinal Cord? **[2]**

31. **[B26 Q7(iii)]** (a) Explain the term Synapse. (b) Name the neurotransmitter that allows transmission of impulses across the synapse. **[2]**

32. **[B26 Q8(ii)]** (a) Name the fluid present between the meninges in the spinal cord. (b) What is its function? **[2]**

33. **[B25 Q7(v)]** Vineet's coffee: (a) Organ stimulated by caffeine which makes him alert? (b) Collective term for the protective membranes of that organ? (c) Which part of the autonomic nervous system increases adrenaline secretion? **[3]**

34. **[S26 Q5(iv)]** Mention the number of cranial nerves and spinal nerves in a human being. **[2]**

35. **[S26 Q7(ii)]** Distinguish between Sympathetic system and Parasympathetic system on the basis of heartbeat. **[2]**

36. **[B23 Q7(i)]** What is a Reflex action? **[1]**

37. **[B26 Q6(v)]** [Copy the given diagram of a cross section of the spinal cord] (a) Name the structure. (b) Label Grey matter and White matter. **[3]**

4. SENSE ORGANS (EYE and EAR)

MCQs / Assertion-Reason

1. **[B25 Q1(ii)]** The structure at the junction of the choroid and iris, itself a part of the choroid: (a) Ciliary body (b) Suspensory ligament (c) Pupil (d) Lens **[1]**

2. **[B24 Q1(vii)]** The ear ossicle that transports sound vibrations to the inner ear: (a) Stapes (b) Malleus (c) Incus (d) Cochlea **[1]**

3. **[B24 Q1(ix)]** Adjusting the focal length of the eye lens for different distances is done by: (a) Cornea (b) Iris (c) Ciliary muscles (d) Sclera **[1]**

4. **[B25 Q1(xiii)]** Owls see well at night due to: (a) Cones and Rhodopsin (b) Rods and Iodopsin (c) Rods and Rhodopsin (d) Cones and Iodopsin **[1]**

5. **[S25 Q1(ii)]** The antiseptic present in tears: (a) Iodine (b) Hydrogen peroxide (c) Lysozyme (d) Lysosome **[1]**

6. **[S25 Q1(vii)]** A: Rods and Cones are photoreceptors in the sclera of the eyeball. R: Rods are sensitive to dim light. **[1]**

7. **[S25 Q1(xii)]** Rahul inserted a hairpin in his ear and felt sharp pain with loss of hearing. This was due to: (a) Rupture of eardrum (b) Rupture of vestibule (c) Rupture of cornea (d) Rupture of pinna **[1]**

8. **[S24 Q1(iii)]** Peter inserted a stick into his ear and lost hearing due to rupture of: (a) Ear drum (b) Pericardium (c) Cornea (d) Pinna **[1]**

9. **[S26 Q1(vii)]** Aruna came out of a theatre into bright sun, felt dazzled, and her vision normalised after a few minutes. This is due to: (a) Accommodation of eye (b) Mutation (c) Polarisation (d) Adaptation of eyes **[1]**

10. **[S26 Q1(xv)]** Aditya, who roller-skates: which terms help maintain body balance? (a) Cerebellum, Semicircular canals, Vestibule (b) Vestibule, Sclera, Cerebrum (c) Malleus, Semicircular canals, Utriculus (d) Sacculus, Stapes, Cochlea **[1]**

11. **[B23 Q1(xiii)]** Vitreous humour is present between: (a) Cornea and Iris (b) Lens and Retina (c) Iris and Lens (d) Cornea and Lens **[1]**

12. **[S23 Q1(x)]** The part of the human eye where rods and cones are located is: (a) Iris (b) Retina (c) Sclera (d) Choroid **[1]**

13. **[S23 Q1(xi)]** Organ of Corti is present in: (a) Utriculus (b) Sacculus (c) Cochlea (d) Incus **[1]**

Name / Odd one out / Sequence

14. **[B26 Q2(i)(b)]** A defect in the eye in which some parts of the object are in focus while other parts are blurred. **[1 of 5]**

15. **[B24 Q2(i)(b)]** Same question as above. **[1 of 5]**

16. **[B25 Q2(i)(c)]** The ear ossicle which opens into the oval window of the cochlea. **[1 of 5]**

17. **[S27 Q2(i)(b)]** The fluid present between the cornea and lens of the eye. **[1 of 5]**

18. **[B25 Q2(iv)(c)]** A structure that collects the sound waves and conducts them through the external auditory canal. **[1 of 5]**

19. **[S26 Q2(iii)(c)]** Tympanum, Pinna, Auditory canal, Malleus **[1 of 5]**

20. **[S24 Q2(iv)(d)]** Oval window, Cochlea, Auditory canal, Round window **[1 of 5]**

21. **[B24 Q2(ii)(b)]** Arrange: Pupil, Aqueous humour, Retina, Vitreous humour **[1 of 5]**

22. **[S24 Q2(ii)(b)]** Arrange: Cochlea, Malleus, Pinna, Stapes **[1 of 5]**

23. **[S25 Q2(iii)(c)]** Arrange: Auditory canal, Organ of Corti, Stapes, Malleus **[1 of 5]**

24. **[B23 Q2(ii)(d)]** Arrange: Fovea, Lens, Cornea, Conjunctiva **[1 of 5]**

25. **[S23 Q2(ii)(b)]** Arrange: Tympanum, Incus, Malleus, Stapes **[1 of 5]**

26. **[S23 Q2(ii)(e)]** Arrange: Aqueous humour, Optic nerve, Retina, Lens **[1 of 5]**

27. **[B23 Q2(iv)(e)]** Odd one out: Malleus, Incus, Cochlea, Stapes **[1 of 5]**

Long structured questions (5 marks)

28. **[S24 Q2(iii)]** Fill in the blanks: technical term for short sightedness (a); eyeball is (b) from front to back or the lens is too (c); corrected by suitable (d) lens; power of lens mentioned in (e). **[5]**

29. **[S26 Q2(iv)]** Rajeev's eye-clinic poster: (a) fluid that lubricates the eye (b) cells for colour vision (c) nerve from eyeball to brain (d) structure that gives colour to the eyes (e) part that allows entry of light rays. **[5]**

30. **[S25 Q2(v)]** [Cross section of human eye, structures (a) to (e)] Match with functions: 1. Protects retina 2. Regulates size of pupil 3. Alters shape of lens 4. Keeps lens moist 5. Transmits nerve impulses to brain 6. Holds lens in position. Example: (f) – 6. **[5]**

31. **[S27 Q2(iv)]** Tanya's earache from a throat infection: (a) Structure connecting throat and ear (b) Collective term for the three cartilaginous structures in the middle ear (c) Sensory organ in cochlea (d) Significance of tiny hair in auditory canal (e) Function of auditory nerve. **[5]**

Short answers

32. **[B26 Q3(ii)]** Eagles have binocular vision. What is the advantage of such a vision? **[2]**

33. **[B24 Q7(ii)]** Which parts of the ear are responsible for (a) Static equilibrium (b) Dynamic equilibrium? **[2]**

34. **[S24 Q8(ii)]** Name the two sensory cells in the retina meant for light adaptation. **[2]**

35. **[B25 Q5(iv)]** Rachna, a gymnast, has dizziness and loses balance: (a) Which part of the membranous labyrinth maintains balance on the beam? (b) Which type of balance does it maintain? **[2]**

36. **[B25 Q6(iii)]** Ahmed had a severe throat infection, then developed an earache. What could be the reason for the pain in his ears? Explain. **[2]**

37. **[B25 Q6(iv)]** Mr. Sharma (76) has gradually blurring vision, diagnosed as cataract: (a) Which part of the eye does cataract affect? (b) Why does the vision become blurred? **[2]**

38. **[S25 Q8(iv)]** Chris watching fireworks: (a) Trace the path of light rays using: Fovea, Lens, Conjunctiva, Pupil, Cornea (b) Nerve that carries the impulse for vision to the brain. **[2]**

39. **[S26 Q6(iv)]** Which part of the ear equalizes air pressure on either side of the ear drum? Where is this structure located? **[2]**

40. **[S26 Q8(iv)]** We should not insert sharp objects into the ear to remove ear wax. Give a suitable reason. **[2]**

41. **[S27 Q8(iii)]** What is the reason for Hyperopia? How can it be corrected? **[2]**

42. **[B23 Q7(iv)]** Distinguish between Semicircular canals and Utriculus based on their function. **[2]**

43. **[S23 Q5(iii)]** State two functions of vitreous humour. **[2]**

44. **[S23 Q7(i)]** Explain the term: Accommodation of eye. **[1]**

45. **[B24 Q7(v)]** Mahesh could not see the heart diagram on the blackboard clearly (blurred): (a) Defect of the eye (b) Where is the image formed? (c) Type of lens in his spectacles? **[3]**

46. **[B26 Q5(v)]** Tara's 70-year-old grandmother has difficulty threading a needle (age-related disorder): (a) Name the eye disorder (b) How can it be corrected? (c) Where is the image formed? **[3]**

47. **[B26 Q8(v)]** Rajat Singh (stone quarry worker) lost hearing; loud noise damaged part of his internal ear, tympanic membrane intact: (a) Collective term for the structure in the internal ear (b) Sensory organ in the cochlea that was damaged (c) What kind of pollution do the workers face? **[3]**

48. **[S25 Q7(v)]** Kathak learners feel dizzy while spinning: (a) Part of the membranous labyrinth responsible (b) Give a suitable reason (c) Nerve that carries the impulse for dizziness to the brain. **[3]**

49. **[S23 Q6(v)]** [Diagram of the membranous labyrinth with semicircular canals labelled 'A']: (a) Identify the structure. (b) In which part of the ear is it located? (c) What is the function of the part marked A? **[3]**

5. ENDOCRINE SYSTEM

MCQs / Assertion-Reason

1. **[B24 Q1(iv)]** The hormone that affects urination: (a) Adrenaline (b) Vasopressin (c) Oestrogen (d) Thyroxine **[1]**

2. **[B25 Q1(iv)]** The hormone that induces vigorous uterine contractions in a pregnant mother: (a) Oestrogen (b) Prolactin (c) Oxytocin (d) Progesterone **[1]**

3. **[B25 Q1(ix)]** A: Deficiency of Antidiuretic hormone causes an increase in urination. R: ADH acts on the kidney to reabsorb water from the kidney tubules. **[1]**

4. **[B25 Q1(xv)]** [Picture of a face with swelling at the neck] Identify the defect and the cause: (a) Simple goitre, under secretion of thyroxine (b) Ex-ophthalmic goitre, over secretion of thyroxine (c) Simple goitre, over secretion of thyroxine (d) Ex-ophthalmic goitre, under secretion of thyroxine **[1]**

5. **[S25 Q1(viii)]** Priya matched hormones with effects: P – stimulates conversion of glycogen to glucose; Q – reabsorption of water by the nephrons. Correct pair? (a) P Insulin, Q Glucagon (b) P Adrenaline, Q Oxytocin (c) P Glucagon, Q Vasopressin (d) P Vasopressin, Q Adrenaline **[1]**

6. **[S26 Q1(iv)]** Reena gets emotionally stressed as exams approach. Which hormone is responsible? (a) Adrenaline (b) Thyroxine (c) Insulin (d) Growth hormone **[1]**

7. **[S26 Q1(vi)]** A: Pituitary gland is known as the master gland. R: It regulates the activities of other exocrine glands. **[1]**

8. **[B23 Q1(v)]** Alpha cells of Pancreas secrete: (a) Glycogen (b) Glucose (c) Glucagon (d) Insulin **[1]**

9. **[S23 Q1(v)]** Cretinism and Myxedema are due to: (a) Hypersecretion of thyroxine (b) Hypersecretion of growth hormone (c) Hyposecretion of thyroxine (d) Hypersecretion of growth hormone **[1]**

Odd one out / Sequence / Match

10. **[B26 Q2(iii)(a)]** Auxin, Oxytocin, Gibberellin, Cytokinin **[1 of 5]**

11. **[B26 Q2(iii)(b)]** Growth Hormone, Vasopressin, Thyroid Stimulating Hormone, Gonadotropic Hormone **[1 of 5]**

12. **[S24 Q2(iv)(e)]** ADH, TSH, ACTH, NADP **[1 of 5]**

13. **[S27 Q2(iii)(b)]** TSH, ADH, ACTH, FSH **[1 of 5]**

14. **[B25 Q2(iii)(d)]** Arrange: Insulin release, High blood sugar, Lowers blood sugar, Stimulates glucose uptake from blood **[1 of 5]**

15. **[S23 Q2(i)(c)]** Name the mineral element required for the synthesis of thyroxine. **[1 of 5]**

16. **[B23 Q2(iii)]** Match Column I with Column II: (a) Hyposecretion of Thyroxine in adults (b) Hyposecretion of Insulin (c) Hypersecretion of Growth hormone in childhood (d) Hyposecretion of ADH (e) Hypersecretion of Thyroxine with [Diabetes insipidus, Myxedema, Dwarfism, Gigantism, Diabetes mellitus, Exophthalmic goitre, Cretinism]. **[5]**

17. **[S23 Q2(iv)(a)]** Odd one out: Thyroid gland, Lacrimal gland, Pituitary gland, Adrenal gland **[1 of 5]**

18. **[S23 Q2(iv)(e)]** Odd one out: Auxin, Oxytocin, Gibberellin, Cytokinin **[1 of 5]**

19. **[B23 Q2(v)(a)]** State the exact location of Thyroid gland. **[1 of 5]**

20. **[B23 Q2(v)(e)]** State the exact location of Islets of Langerhans. **[1 of 5]**

21. **[S23 Q2(v)(e)]** State the exact location of Adrenal glands. **[1 of 5]**

Long structured questions

22. **[B26 Q2(iv)]** Mohit, 30, sedentary software professional, high blood sugar despite normal weight: (a) hormonal disorder (b) hormone responsible (c) organ that secretes it (d) one symptom (e) one lifestyle change to lower blood sugar. **[5]**

23. **[B25 Q2(v)]** [Outline of human body with endocrine glands (a) to (f)] Match glands (a) to (e) with functions: 1. Prepares body to face stress 2. Secretes tropic hormones 3. Secretes Oestrogens 4. Maintains blood sugar level 5. Regulates basal metabolism 6. Secretes Testosterone. Example: (f) – 6. **[5]**

24. **[B24 Q2(v)]** Match Column I (Leydig Cells, Stoma, Ova, Cranial nerve, Cretinism) with Column II (1. Lack of thyroxine in children 2. 12 pairs 3. Testosterone 4. Diffusion of respiratory gases 5. Haploid cells 6. 31 pairs 7. Diploid cells). *(mixed: also touches Reproductive and Nervous)* **[5]**

25. **[S24 Q2(v)]** Match Column I (Spinal Cord, Adrenal medulla, Number of autosomes in man, Kidney, Adrenal cortex) with Column II (1. Adrenalin 2. 44 3. Nephrons 4. 46 5. Thyroxine 6. Neurons 7. Cortisones). *(mixed)* **[5]**

26. **[S27 Q4(i)]** Pallavi, 30, shows male characteristics (moustache, beard, chest hair): (a) Biological term for the disorder [1] (b) Hormone responsible; gland that secretes it [2] (c) Explain the term hormone [2] (d) Expand TSH and ACTH [2]. **[7]**

Short answers

27. **[B24 Q6(ii)]** Distinguish between Diabetes mellitus and Diabetes insipidus (endocrine gland concerned). **[2]**

28. **[S26 Q4(ii)]** Differentiate between Diabetes mellitus and Diabetes insipidus with reference to the hormone involved. **[2]**

29. **[B26 Q6(ii)]** A 17-year-old girl with irregular menstrual cycle, diagnosed with Adrenal Virilism [picture of facial hair]: (a) Hypersecretion of which hormone causes it in females? (b) One symptom of the disorder. **[2]**

30. **[B24 Q7(i)]** Define the term hormone. **[1]**

31. **[S25 Q4(i)]** Why is Adrenaline called 'The Emergency Hormone'? **[1]**

32. **[S25 Q4(ii)]** Expand ADH. Give one example of a diuretic substance. **[2]**

33. **[S25 Q4(iii)]** Mention the significance of (a) Iodine in our food (b) Magnesium for green plants. **[2]**

34. **[S25 Q6(ii)]** What are Tropic hormones? Give one example. **[2]**

35. **[S26 Q6(iii)]** Expand (a) ACTH (b) ADH. **[2]**

36. **[B24 Q8(ii)(b)]** Name the mineral element required for synthesis of thyroxine. **[1 of 2]**

37. **[S23 Q5(iv)]** Which gland secretes Glucagon? What is its effect on blood sugar level? **[2]**

6. REPRODUCTIVE SYSTEM

MCQs / Assertion-Reason

1. **[B25 Q1(iii)]** A: Seminal vesicles pour an alkaline secretion into the semen as it passes through the ureter. R: The female vagina is acidic and needs to be neutralized for sperm survival. **[1]**

2. **[S25 Q1(iii)]** A: The foetus respires but does not breathe. R: The maternal blood supplies oxygen to the foetus through the placenta. **[1]**

3. **[S25 Q1(vi)]** The onset of menstruation in a human female is called: (a) Menopause (b) Menarche (c) Ovulation (d) Oogenesis **[1]**

4. **[S26 Q1(xi)]** Same question as above. **[1]**

5. **[B26 Q1(xv)]** During which phase of the menstrual cycle does the endometrium shed? (a) Follicular (b) Ovulatory (c) Menstrual (d) Luteal **[1]**

6. **[S26 Q1(x)]** The hormone that maintains thickening of the endometrium during pregnancy: (a) Oestrogen (b) ACTH (c) Progesterone (d) Oxytocin **[1]**

7. **[S26 Q1(xiv)]** Tanvi matched menstrual phases with days: P Follicular – Day 5–12; Q Luteal – Day 15–28; R Menstrual – Day 3–5; S Ovulatory – Day 13 or 14. Identify the correct sequence: (a) P,Q,R,S (b) Q,S,R,P (c) R,P,S,Q (d) S,R,P,Q **[1]**

8. **[S24 Q1(x)]** The structure related to storage and maturation of sperms in a human male: (a) Epididymis (b) Epidermis (c) Epithelium (d) Endothelium **[1]**

9. **[B23 Q1(i)]** The sex chromosome in a human ovum is: (a) X chromosome (b) Y chromosome (c) Both X and Y chromosomes (d) Either X or Y chromosome **[1]**

10. **[S23 Q1(ii)]** On which day of the menstrual cycle does ovulation take place? (a) 1st day (b) 5th day (c) 14th day (d) 28th day **[1]**

11. **[S23 Q1(viii)]** The part that is cut in Vasectomy is: (a) Urethra (b) Oviduct (c) Fallopian tube (d) Vas deferens **[1]**

12. **[S23 Q1(ix)]** Gestation period of human foetus is: (a) 40 days (b) 280 days (c) 280 weeks (d) 40 months **[1]**

Name / Odd / Match / Location

13. **[B26 Q2(i)(d)]** The surgical technique for females that can be used to prevent pregnancy. **[1 of 5]**

14. **[B24 Q4(i)]** Biological term for the surgical method of contraception in human females. **[1]**

15. **[B24 Q2(i)(e)]** The process of attachment of fertilized ovum to the wall of uterus. **[1 of 5]**

16. **[B25 Q2(i)(a)]** The fully developed part of the ovary containing a mature ovum. **[1 of 5]**

17. **[B25 Q2(iv)(a)]** The canal through which the testes descend into the scrotum just before birth of a male baby. **[1 of 5]**

18. **[S27 Q2(i)(c)]** Same question as above. **[1 of 5]**

19. **[S25 Q2(i)(c)]** The structure that connects placenta and the human foetus. **[1 of 5]**

20. **[S25 Q2(iv)(b)]** A cell formed by the fusion of gametes. **[1 of 5]**

21. **[S26 Q2(i)(b)]** The inner lining of the uterus. **[1 of 5]**

22. **[B26 Q2(iii)(e)]** Morula, Blastocyst, Oviduct, Foetus **[1 of 5]**

23. **[S27 Q2(iii)(e)]** Vas deferens, Endometrium, Seminiferous tubule, Vas efferens **[1 of 5]**

24. **[B25 Q2(iii)(e)]** Arrange: Sperm duct, Seminiferous tubule, Epididymis, Efferent ducts **[1 of 5]**

25. **[S24 Q2(ii)(e)]** Arrange: Embryo, Foetus, Blastocyst, Morula **[1 of 5]**

26. **[B23 Q2(i)(c)]** Name the permanent stoppage of menstruation in human females around the age of 45 years. **[1 of 5]**

27. **[B23 Q2(ii)(e)]** Arrange: Testis, Urethra, Sperm duct, Epididymis **[1 of 5]**

28. **[S23 Q2(ii)(d)]** Arrange: Sperm, Urethra, Sperm duct, Epididymis **[1 of 5]**

29. **[B23 Q2(iv)(d)]** Odd one out: Menstrual phase, Telophase, Follicular phase, Luteal phase **[1 of 5]**

30. **[B23 Q2(v)(c)]** State the exact location of Amniotic fluid. **[1 of 5]**

31. **[S23 Q2(v)(d)]** State the exact location of Prostate gland. **[1 of 5]**

Long structured questions (5 marks)

32. **[B26 Q2(ii)]** [Diagram of human sperm] Fill in blanks: cap-like organelle (Lysosome/Acrosome); enzyme (Hyaluronidase/Amylase); nucleus has (23/46) chromosomes; middle piece has (Chloroplast/Mitochondria); (Semen/Hymen) is a mixture of sperms and fluids from male accessory glands. **[5]**

33. **[S27 Q2(ii)]** Ovary passage; select from [fertilisation, 280, uterus, oviduct, ova, 40, ovulation, ovules, parturition]: (a) gametes produced by ovaries (b) release of mature ovum from Graafian follicle (c) menstrual flow occurs when ___ of the female gamete fails (d) implantation of embryo is in the ___ (e) gestation period lasts ___ weeks. **[5]**

34. **[S26 Q2(v)]** [Male reproductive system diagram] Match structure with function: (a) Secrete Testosterone (b) Transports sperms to Epididymis (c) Stores sperms till maturation (d) Transports sperms to urethra (e) Produce sperms (f) Regulates temperature of Testis. Example: Scrotum – (f). **[5]**

35. **[S27 Q2(v)]** [Diagram of uterus with foetus] Match structure with function: (a) Allows diffusion of glucose from maternal blood into foetal blood (b) Tube-like structure transporting substances to and from foetus (c) Protective membrane surrounding foetus (d) Cushions the foetus and absorbs shocks (e) Dilates to enable birth of baby (f) Site of fertilisation. Example: Fallopian tube – (f). **[5]**

Short answers

36. **[S26 Q3(i)]** Explain the term Menarche. **[1]**

37. **[S24 Q4(iii)]** Differentiate between Menarche and Menopause. **[2]**

38. **[S24 Q4(ii)]** What are the two hormones secreted by Corpus luteum? **[2]**

39. **[S24 Q4(iv)]** What is the significance of placenta in the growth of foetus? **[2]**

40. **[B26 Q5(iii)]** A 28-year-old pregnant woman's placenta is functioning well: (a) One function of the placenta (b) What connects the placenta to the foetus? **[2]**

41. **[B25 Q7(iii)]** Mention any two functions of amniotic fluid. **[2]**

42. **[B25 Q5(iii)]** Differentiate between the functions of Urethra and Uterus. **[2]**

43. **[B24 Q6(iv)]** [Section of human ovary, parts 1 and 2] (a) Name the process for release of part 1 (b) Name the structure marked 2. **[2]**

44. **[B26 Q4(v)]** Akshay's father had prostate tumour surgery and now has urinary incontinence [diagram]: (a) Where is the prostate gland located? (b) Why does it produce an alkaline secretion? (c) Structure that regulates flow of urine from bladder into urethra. **[3]**

45. **[B26 Q5(iv)]** Mention any two secondary sexual characteristics in a 15-year-old boy. **[2]**

46. **[B26 Q7(iv)]** What is the role of (a) Leydig cells (b) Seminiferous tubules? **[2]**

47. **[S25 Q6(iv)]** What is the significance of Testes being placed in Scrotal sacs? **[2]**

48. **[S25 Q7(ii)]** Mention the surgical methods of contraception in (a) Men (b) Women. **[2]**

49. **[S25 Q8(ii)(b)]** Rewrite the correct statement: "Seminiferous tubules secrete Testosterone." **[1 of 2]**

50. **[S26 Q8(iii)]** Identical twins are always of the same gender. Explain why. **[2]**

51. **[S27 Q8(iv)]** State one difference between identical twins and fraternal twins. **[2]**

52. **[B23 Q6(iii)]** Mention any two functions of the human foetal placenta. **[2]**

53. **[B23 Q6(iv)]** What is the significance of the human testes being located in scrotal sacs outside the abdomen? **[2]**

54. **[S23 Q7(iii)]** Mention two functions of Amniotic fluid. **[2]**

55. **[S23 Q8(iii)]** Differentiate between Menarche and Menopause. **[2]**

Diagrams

56. **[S24 Q4(v)]** Draw a neat, labelled diagram of a human gamete that has the sex chromosome Y. **[3]**

57. **[S25 Q6(v)]** Draw a neat, labelled diagram of a human sperm. **[3]**

58. **[B23 Q4(v)]** Draw a neat, labelled diagram of a human sperm. **[3]**

7. HUMAN EVOLUTION

MCQs / Assertion-Reason

1. **[B25 Q1(v)]** A scientist cut the tails of all mice and made them reproduce. What will be the phenotype of the offspring? (a) All tailless (b) Mix of tailed and tailless (c) All will have tails (d) Cannot be predicted **[1]**

2. **[S25 Q1(ix)]** A well-developed chin is observed in: (a) Homo habilis (b) Homo erectus (c) Homo sapiens (d) Australopithecus **[1]**

3. **[S25 Q1(xiv)]** Examples of vestigial organs in humans, who was correct? Raj: Wisdom teeth and Pinna; Sonu: Body hair and large intestine; Lata: Vermiform appendix and wisdom teeth; Abhay: Pinna and Ossicles. (a) Abhay and Sonu (b) Sonu and Lata (c) Raj and Lata (d) Abhay and Raj **[1]**

4. **[S26 Q1(ix)]** Industrial melanism is the phenomenon by which the peppered moth: (a) dies due to industrial growth (b) in polluted areas became darker for better camouflage (c) became lighter due to natural selection (d) became resistant to industrial pollution **[1]**

5. **[B24 Q1(xv)]** Industrial Melanism was observed in: (a) Mice (b) Peppered Moth (c) House Flies (d) Crow **[1]**

Name / Odd one out / Sequence

6. **[B26 Q2(i)(e)]** The evolutionary process by which new species arise from existing ones. **[1 of 5]**

7. **[B25 Q2(i)(e)]** An insect which is a classic example of natural selection due to industrial melanism. **[1 of 5]**

8. **[S27 Q2(iii)(c)]** Wisdom tooth, Pinna, Tongue, Vermiform appendix **[1 of 5]**

9. **[B24 Q2(ii)(a)]** Arrange: Australopithecus, Cro-Magnon, Homo erectus, Neanderthal man **[1 of 5]**

Short answers

10. **[B26 Q4(i)]** What is the scientific name of modern man? **[1]**

11. **[S24 Q7(i)]** What is the scientific name for man? **[1]**

12. **[B26 Q4(iii)]** (a) Who proposed the theory of Natural Selection? (b) Name the organism used as an example to explain Industrial Melanism. **[2]**

13. **[S27 Q8(i)]** Who proposed the theory of 'Natural Selection'? **[1]**

14. **[B24 Q5(ii)]** Differentiate between Australopithecus and Modern man based on body hair. **[2]**

15. **[S26 Q8(ii)]** Mention two body features of Australopithecus. **[2]**

16. **[S27 Q8(ii)]** Mention two characteristic features of Australopithecus. **[2]**

17. **[B25 Q8(iv)]** Give any two characteristic features of a Cro-Magnon man. **[2]**

18. **[S24 Q7(iv)]** Mention any two features of the Cro-Magnon man. **[2]**

19. **[B25 Q6(ii)]** What are Vestigial organs? Give one example of a vestigial structure in the human mouth. **[2]**

20. **[S24 Q7(ii)]** What are vestigial organs? Give one example. **[2]**

(Note: Human Evolution was excluded from the 2023 syllabus.)

8. POPULATION

MCQs

1. **[B24 Q1(xiv)]** Birth rate is the number of live births per thousand persons in: (a) 1 year (b) 2 years (c) 10 years (d) 20 years **[1]**

2. **[B25 Q1(i)]** The number of live births per thousand people per year is called: (a) Mortality (b) Population density (c) Population growth rate (d) Natality **[1]**

3. **[S24 Q1(vii)]** The age restrictions for marriage for boys and girls by law in India: (a) Boys 18, Girls 21 (b) Boys 17, Girls 16 (c) Boys 21, Girls 18 (d) Boys 20, Girls 17 **[1]**

4. **[S26 Q1(xiii)]** Cultural revolution favours a steep rise in human population. Correct sequence of revolutions: (a) Tool making, Scientific and Industrial, Agricultural (b) Agricultural, Tool making, Scientific and Industrial (c) Scientific and Industrial, Agricultural, Tool making (d) Tool making, Agricultural, Scientific and Industrial **[1]**

5. **[B26 Q1(vii)]** A health organisation wants to educate a rural audience about population control using visually engaging methods. Which would be effective? P. Posters Q. Loudspeakers R. Film shows S. Street plays. (a) P, R and S (b) Q, R and S (c) P, Q and R (d) P, Q and S **[1]**

6. **[B23 Q1(viii)]** The statistical study of human population is called: (a) Mortality (b) Demography (c) Natality (d) Equality **[1]**

Name / Define / Match / Explain

7. **[S25 Q2(i)(d)]** The statistical study of human population. **[1 of 5]**

8. **[B26 Q6(i)]** Explain the term 'Population Density' with reference to human beings. **[1]**

9. **[S26 Q7(i)]** Explain the term Natality. **[1]**

10. **[S23 Q2(i)(e)]** Name the statistical study of human population. **[1 of 5]**

11. **[S23 Q2(iii)(a & d)]** Match Column I with Column II: (a) Natality – Birth rate; (d) Mortality – Death rate. **[2 of 5]**

Short answers

12. **[B24 Q5(iii)]** "Birth rate in India is very high." Mention two reasons in support. **[2]**

13. **[B25 Q7(ii)]** [Overpopulation picture] Human population has increased tremendously; death rate reduced and life expectancy increased. (a) Any one reason for reduction in death rate (b) Any one resource under pressure due to population explosion. **[2]**

14. **[S27 Q5(iii)]** Mention two reasons for population explosion in India. **[2]**

15. **[S27 Q5(v)]** List any three resources that come under pressure due to rising population. **[3]**

16. **[B23 Q5(i)]** Explain the term 'Population density'. **[1]**

17. **[B23 Q5(ii)]** Name the two surgical methods of population control. **[2]**

18. **[B23 Q5(iii)]** Mention two factors responsible for population explosion in India. **[2]**

19. **[B23 Q5(iv)]** Name any two resources which come under pressure due to rising population. **[2]**

20. **[S23 Q7(ii)]** Give two reasons for a sharp rise in world human population. **[2]**