

COMPETENCY-FOCUSED PRACTICE QUESTIONS

ICSE - CLASS X 2024

BIOLOGY

PREFACE

With a growing emphasis on competency-based education globally, the educational landscape in India has also steered towards high-quality learning experiences that allow learners to incorporate critical thinking and problem-solving approaches. This approach goes beyond rote memorisation and focuses on developing the skills and knowledge that students need to apply in their real-world scenarios.

The Council for the Indian School Certificate Examinations (CISCE), as a national-level progressive examination board, has taken several steps to infuse competency-based education in CISCE schools through teacher capacity-building on item development for competency-based assessments and the incorporation of competency-focused questions at the ICSE and ISC levels from the examination year 2024.

To further facilitate the adoption of competency-based assessment practices in schools and to support teachers and students towards the preparation for attempting higher-order thinking questions in future board examinations, Item Banks of **Competency-Focused Practice Questions** for selected subjects at the ICSE and ISC levels have been developed. This Item Bank consists of a rich variety of questions, both objective and subjective in categories, aimed at enhancing the subject-specific critical and analytical thinking skills of the students.

In this Item Bank, each question is accompanied by the topic and cognitive learning domain/s that it intends to capture. The cognitive domains reflected in these questions include understanding, analysis, application, evaluation and creativity, along with some questions of the higher-order recall domain. The Answer Key at the end presents the possible answers to a given question, but it is neither limiting nor exhaustive.

These practice questions are also meant to serve as teacher resources for classroom assignments and as samplers to develop their own repository of competency-focused questions. Apart from offering a good practice of higher-order thinking skills, engaging with these questions would allow students to gauge their own subject competencies and use these *assessments for learning* to develop individual learning pathways.

During the development of this Item Bank, a large pool of questions was prepared by a team of experienced CISCE teachers. The questions that were finalised by the internal and external reviewers as being higher-order competency-focused questions have been collated in this item bank.

I acknowledge and appreciate all the ICSE and the ISC subject matter experts who have contributed to the development and review of these high-quality competency-focused questions for CISCE students.

We are hopeful that teachers and students will utilise these questions to support their teaching-learning processes.

July 2024

Dr. Joseph Emmanuel Chief Executive & Secretary CISCE

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	Empowering Minds & Transforming Lives since 1958	

COMPETENCY-FOCUSED PRACTICE QUESTIONS

ICSE - CLASS X

Biology

I: Multiple Choice Questions (1 Mark Each)

S.No.	Questions	
1.	[Pollution]	
	Rita suffers from constant headaches and high blood pressur an airport. What could be the <i>most likely</i> cause of her condition	
	Rita suffers from constant headaches and high blood pressur an airport. What could be the <i>most likely</i> cause of her conditi (a) Noise pollution (b) Air pollution (c) Nuclear pollution (d) Water pollution	[Analysis]
2.	[Human Anatomy and Physiology] An exo-endocrine gland in the human body is:	
	(a) Pituitary gland (b) Pancreas (c) Salivary gland (d) Adrenal gland	
	(d) Adrenal gland	[Application & Analysis]
3.	[Human Anatomy and Physiology] Assertion: If both kidneys fail, urea from the blood is remove Reason: Accumulation of urea in the human body is toxic.	ed by dialysis.
	(a) A is True, and R is false.(b) A is False, and R is true.	
	(c) Both A and R are true.	
	(d) Both A and R are false.	[Application & Analysis]
4.	[Human Anatomy and Physiology]	
	Rajesh was told to buy a blue cloth by his craft teacher. He colour from green and hence brought a green cloth to class. V have resulted in this?	
	(a) Myopia(b) Cataract(c) Colour blindness	
	(d) Hyperopia	[Analysis]

S.No. **Questions** 5. [Plant Physiology] Mary sprinkled 5 kg of common salt on the grass growing on her lawn. After a couple of days, she observed that the grass had wilted and died. This was due to which of the following conditions? (a) Endosmosis (b) Turgidity (c) Deplasmolysis (d) Plasmolysis [Understanding & Analysis] [Human Anatomy and Physiology] 6 In cholera, patients suffer from vomiting and watery bowels. They may die due to the: (a) poisoning by the accumulation of high quantities of urea in the body. (b) ability of the intestines to absorb water into the blood. (c) excretion of almost all the water by the kidneys. (d) the failure of the kidneys. [Understanding] ENIAN SCHOOL CEAT 7. [Basic Biology] A. NEW DELHI & Transformi The given figures A and B show _____ and ____ stages of cell division. (a) prophase, metaphase (b) telophase, anaphase (c) metaphase, anaphase (d) anaphase, telophase [Analysis] 8. [Human Anatomy and Physiology] A person is suffering from kidney failure. He is put on a dialysis machine by the doctors. The osmotic pressure of dialysis fluid should be: (a) equal to that of blood. (b) more than that of blood. (c) less than that of blood. (d) equal to zero. [Application]

Questions
[Human Anatomy and Physiology]
A squirrel is in a scary situation. The secreted adrenaline prepares the body to meet the situation. Which of the following is NOT TRUE for this situation?
(a) Adrenaline prepares the body to fight danger.
(b) Extra energy and strength are provided to the body.(c) At the time of the stress, fewer hormones are released into the blood.
(d) Adrenaline prepares the body to run away from danger. [Understanding]
[Human Anatomy and Physiology]
Assertion (A): The main pulmonary artery pumps oxygenated blood from the right vertical into the lungs.
Reason (R): Inside the lungs, the artery divides and divides several times to form capillaries around the air sacs.
(a) A is True, and R is false.(b) A is False, and R is true.
(c) Both A and R are true. (d) Both A and R are false. [Understanding]
[Human Anatomy and Physiology]
Given below are some common reflexes in humans.
i. Quick closing of the eyelids when a strong beam of light is flashed across.
ii. Apply brakes to your vehicle if anything suddenly comes in front.iii. Playing a musical instrument NEW DELHI
iv. Coughing reflex, when the food is swallowed, enters the windpipe.
The conditioned reflexes are:
(a) i and ii
(b) ii and iii(c) iii and iv
(d) i and iv [Analysis]
[Plant Physiology]
Electrons released on splitting of water molecules in photosynthesis are used in producing:
(a) NADP
(b) NADPH (c) ATP
(d) O_2 [Analysis]

Questions S.No. 13. [Human Anatomy and Physiology] The four major steps in seeing an object are: i. interpretation by the brain. ii. focussing of image. iii. entry of light rays. iv. transmission of nerve impulses from the retina & brain. The correct sequence will be: (a) i, ii, iii, iv (b) ii, iii, iv, i (c) iii, ii, iv, i (d) iv, i, ii, iii [Understanding] 14. [Human Anatomy and Physiology] Based on the given figure, identify the structural as well as the functional unit of kidney: (a) A (b) B (c) C (d) D [Analysis] 15. [Human Anatomy and Physiology] Assertion: Seminiferous tubules produce sperms. Reason: Seminiferous tubules secrete Oxytocin, which aids in the production of sperm. (a) A is True, and R is false. (b) A is False, and R is true. (c) Both A and R are true. (d) Both A and R are false. [Analysis]

S.No.	Questions
16.	[Human Anatomy and Physiology]
	Assertion: The nerve impulse travels from the axon of a neuron to the axon of another neuron.
	Reason: The end portion of the axon has swollen ends, which store neurotransmitters.
	(a) A is True, and R is false.(b) A is False, and R is true.(c) Both A and R are true.
	(d) Both A and R are false. [Understanding]
17.	[Human Anatomy and Physiology]
	Thomas played cricket on a hot summer afternoon. His urine output was much less, though he drank plenty of water. What could be the possible cause?
	P - Kidneys reabsorb a lot of water NEW DELHI Q - Sweat glands are active R - Kidneys absorb less water S - Sweat glands are inactive (a) R and Q (b) P and Q (c) P and S (d) R and S [Analysis & Application]
18.	[Pollution] Acid rain is caused due to polluted cases like Co. So. and oxides of nitrogen. The
	Acid rain is caused due to polluted gases like Co ₂ , So ₂ , and oxides of nitrogen. The pollution which does not take place immediately after acid rain is:
	(a) Air pollution
	(b) Water pollution(c) Soil Pollution
	(d) Noise Pollution [Understanding & Analysis]

S.No.	Questions
19.	[Human Anatomy and Physiology] Surya's father was diagnosed with Diabetes mellitus. The doctor advised him to avoid certain foods. Which are the foods he should avoid eating?
	P - Sweets Q - Leafy vegetables R - Bananas S - Pulses
	(a) P and R (b) Q and S (c) R and S (d) P and Q [Application]
20.	[Human Anatomy and Physiology] During light adaptation:
	 (a) Rods and cones become active. (b) Rods and cones become inactive. (c) Rods become active and cones inactive. (d) Cones become active and rods inactive. [Understanding & Analysis]
21.	[Plant Physiology] A cell of a leaf of an aquatic plant is kept in a 5% salt solution for some time. The phenomenon which will take place is/are: (a) turgidity (b) plant Physiology [Plant Physiology] [P
	(b) plasmolysis (c) turgidity and flaccidity (d) plasmolysis and flaccidity [Application]

II: Fill In the Blank Type (1 Mark Each)

S.No.	Questions
22.	[Plant Physiology] Osmosis is controlled by the concentration of molecules. [Analysis]
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23.	[Plant Physiology]
	An animal cell is kept in a lower solute concentration fluid. The cell will (Enlarge / Shrink) [Application]
24.	[Plant Physiology]
	Plants absorb water from the roots because the cell sap is (more, less) concentrated than the surrounding fluids. [Analysis]

S.No.	Questions
25.	[Human Anatomy and Physiology]
	Human red blood cells, when kept in a hypertonic solution, occurs. (Osmosis, endosmosis, exosmosis) [Application]
26.	[Plant Physiology]
	Given below is an experimental setup. Read the information given below the diagram and answer the questions from 26-30.
	INITIAL LEVEL RISES SUGAR SOLUTION CELLOPHANE WATER
	Concentrated sugar solution is taken in the thistle funnel. The mouth of the thistle funnel is covered with cellophane paper. The thistle funnel is inverted in a beaker containing water.
	The above experiment demonstrates [Recall]
27.	[Plant Physiology] NEW DELHI
	After a few hours, the level of the sugar solution in the thistle funnel.
	[Understanding]
28.	[Plant Physiology]
	It allows only molecules to pass through it freely. [Application]
29.	[Plant Physiology]
	It prevents the passage of molecules. [Application]
30.	[Plant Physiology]
	A control experiment can be set up by taking plain in the thistle funnel and placing it in another beaker containing water. [Application]

III: Short Answer Questions (2 Marks Each)

S.No.	Questions
31.	[Human Anatomy and Physiology]
	Haemorrhage frequently happens in viral dengue fever. Compare this condition with haemophilia. [Evaluate]
32.	[Plant Physiology]
	Differentiate in the rate of photosynthesis for the increase in temperature.
	(a) 20° to 30°C (b) 40°C to 50°C [Analysis]
33.	[Basic Biology]
	Name the nitrogenous base with which Guanine pairs up in the helical structure of DNA and through how many hydrogen bonds? [Understanding]
34.	[Human Anatomy and Physiology]
	When an irritant enters the nose, a sneezing reflex happens. Identify the stimulus and the response. [Application]
35.	[Basic Biology]
	An atomic explosion in 1945 in Japan led to a large number of persisting deformities in the bodies of plants and animals. What might have happened? [Analysis]
36.	[Human Anatomy and Physiology] Transforming Lives since 1958
	Why is a bicuspid valve in the human heart named so? [Understanding]
37	[Plant Physiology]
	Under which condition does a leaf take carbon dioxide from the atmosphere?
	[Analysis]
38.	[Human Anatomy and Physiology]
	A pregnant lady is suffering from viral fever. Will the foetus be infected? [Analysis]
39.	[Human Anatomy and Physiology]
	Why the blood flows through the glomerulus under great pressure? [Understanding]
40.	[Basic Biology]
	Differentiate between genotype and phenotype. [Analysis]
41.	[Pollution]
	The number of asthma patients increases during winters in metropolitan cities like Delhi. Why is it so? How can it be reduced? [Analysis]

S.No.	Questions
42.	[Population] In our country, the infant mortality rate is high, but the population is still increasing in India. Explain. [Analysis]
43.	[Human Evolution] Justify the statement – "Vermiform appendix is a vestigial organ in humans." [Evaluate]
44.	[Human Anatomy and Physiology] What is Adrenal Virilism? [Understanding]
45.	[Human Anatomy and Physiology] Explain the function of corpus luteum when: (a) ovum is fertilised. (b) ovum is not fertilised. [Evaluate]
46.	[Human Anatomy and Physiology] Shruti's mother gave birth to two male babies. Both the babies had a strong resemblance to each other. The doctor said that they have been formed from a single ovum. [1958] (a) What kind of twins are they?
	(b) Why are they of the same gender? [Analysis & Application]
47.	[Human Anatomy and Physiology] State the effect of Adrenaline on: (a) Pupils of eyes (b) Heartbeat [Application]
48.	[Human Anatomy and Physiology] When is albumin passed out in urine? Name this condition. [Understanding]
49.	[Human Anatomy and Physiology] Mention the significance of the Testes being located inside the scrotum. [Understanding & Application]

51. [Human Anatomy and Physiology] Keshav enters a dark room from a brightly lit area. He experiences difficulty in viewing objects, but gradually his vision improves. Explain the role of the photoreceptors in this case. [Analysis & Application] 52. [Human Anatomy and Physiology] On a winter night, a group of workers slept in a closed room, having a burning furnace to keep themselves warm. Most of them died in their sleep. What is the reason for their fatality? [Understanding & Analysis]	S.No.	Questions
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Empowering Minds & Transforming Lives since 1958		

IV: Long Answer Questions (3 Marks Each)

S.No.	Questions
53.	[Human Anatomy and Physiology]
	Rohit's father has increased thirst and hunger with frequent urination. He also gets fatigued very often. His doctor advised him to get a blood sugar profile test done.
	(a) Name the disease based on the symptoms given above.(b) Which is the hormone whose deficiency causes this disorder?(c) What is the technical term for high blood sugar level? [Understanding & Analysis]

S.No. **Questions** 54. [Human Anatomy and Physiology] Farhan's classroom is very close to the compound wall of his school. He was observing two pigeons sitting on the wall. He could see one bird clearly, but the image of the second bird was blurred as the pigeon was a little away from the first. (a) Name the defect of the eye Farhan is suffering from. (b) Where is the image of the second pigeon formed in his eyeballs? (c) What lens can be used to correct the defect? [Analysis & Application] [Human Anatomy and Physiology] CHOOL 55. Manoj was writing a composition on "The importance of Education in life". ives since 1950 **Empowering Minds & Tran** (a) Name the part of the brain that Manoj uses for writing the composition. (b) Is it a voluntary or involuntary action? (c) Trace the nervous pathway using the following terms: Muscles of the hand, Sensory nerves, Fingertips, Motor nerves, and Brain.

[Recall & Application]

S.No.	Questions
56.	[Plant Physiology]
	Study the diagram given below and answer the questions that follow:
	Leaf shoot Air bubble Graduated capillary tube Coloured water
	 (a) Identify the apparatus. (b) What is it used to measure? (c) Mention any one limitation of using the apparatus. [Analysis]
57.	[Plant Physiology] The statements given below are false. Correct and rewrite the complete statements: (a) Fruit ripening is induced by Abscisic acid. (b) Roots show negative Hydrotropism. (c) Thigmotropism can be demonstrated by using a Clinostat. [Analysis]
58.	[Basic Biology] Empowering Minds & Transforming Lives since 1958
	Two heterozygous pea plants having round seeds (Rr) are crossed with each other.
	 (a) Write the Phenotypic ratio of the offspring. (b) What will the genotypic ratio of the offspring be? (c) Which of the above two traits is recessive? [Analysis & Application]
59.	[Plant Physiology]
	How is the rate of transpiration affected under the following environmental conditions:
	(a) High temperature (b) Low hymidity
	(b) Low humidity (c) Low intensity of sunlight [Analysis & Understanding]

Answer Key

S.No.	Expected Answers
1.	(a) Noise pollution
2.	(b) Pancreas
3.	(c) Both A and R are true
4.	(c) Colour blindness
5.	(d) Plasmolysis
6.	(a) poisoning by the accumulation of high quantities of urea in the body.
7.	(c) metaphase, anaphase
8.	(a) equal to that of blood
9.	(c) At the time of the stress, fewer hormones are released into the blood.
10.	(b) A is False, and R is true
11.	(b) ii and iii
12.	(c) ATP CISCE
13.	(c) iii, ii, iv, i
14.	(c) iii, ii, iv, i (c) C (d) C (e) C (f) C (f) C (f) C (g) C
15.	(a) A is True, and R is false
16.	(b) A is False, and R is true
17.	(b) P and Q
18.	(a) Air pollution
19.	(a) P and R
20.	(d) Cones become active and rods inactive.
21.	(d) plasmolysis and flaccidity
22.	water
23.	enlarge
24.	more

S.No.	Expected Answers
25.	exosmosis
26.	osmosis
27.	rises/increases
28.	water
29.	Sugar
30.	water
31.	In viral dengue fever, the number of platelets falls to a very low count, and coagulation occurs, leading to haemorrhage. While haemophilia is a genetic disorder in which blood does not clot properly.
32.	(a) The rate of photosynthesis gets doubled.(b) Photosynthesis stops.
33.	Cytosine, 3 H-bonds
34.	Stimulus – Irritant Response – Sneezing
	Response – Sneezing
35.	The mutation alters the hereditary material of an organism's cells.
36.	It has two flaps.
37.	When the concentration of Co2 is higher outside the leaf than inside.
38.	No, the placenta does not allow the passage of germs from the mother to the foetus.
39.	The efferent (outgoing) arteriole is narrower than the afferent (incoming) arteriole. So, pressure increases.
40.	Genotype is the combination of genes, and phenotype is the expressed character.
41.	Smog (smoke + fog) leads to asthma. Air pollution causes respiratory problems. Installation of tall chimneys in factories with filters, electrostatic precipitators.
42.	People from the economically weaker sections think if safer to produce more children so that at least some may survive.
43.	The vermiform appendix projects from the blind end of the caecum and is a functionless (vestigial) organ in humans.
44.	Overgrowth of the adrenal cortex in a mature woman results in the development of a beard, moustache and deep voice.
45.	(a) Corpus luteum releases progesterone and keeps the uterus in a state suitable for implantation.

S.No.	Expected Answers
	(b) The Corpus luteum stops producing progesterone.
46.	(a) Identical twins(b) Since they develop from a single ovum, the gender of the twins is determined at the time of fertilisation.
47.	(a) Pupils dilate(b) Heartbeat increases
48	Due to high blood pressure, or due to increased permeability of the bowman's capsule membrane on account of bacterial infection, albumin may be passed out via urine. Albuminuria
49.	To maintain a temperature of 2-3°C less than body temperature for sperms to mature. Protect testes from injuries
50.	Food, Water
51.	Rhodopsin gets bleached in bright light. It takes a few seconds for it to regenerate in dim light. Then, the vision improves. Iodopsin does not function in dim light.
52.	Burning furnace emits CO. This combines with oxygen to form a stable compound, Carboxyhaemoglobin, which cuts off the supply of oxygen to tissues.
53.	(a) Diabetes mellitus (b) Insulin (c) Hyperglycemia
54.	(a) Myopia (b) Behind the retina (c) Concave
55.	(a) Cerebrum(b) Voluntary(c) Fingertips, Sensory nerves, Brain, Motor nerves, Muscles of hand
56.	(a) Ganong's Potometer(b) To measure the water uptake by the cut shoot(c) Difficult to introduce an air bubble
57.	(a) Fruit ripening is induced by Ethylene/ Senescence and falling of leaves is induced by Abscisic acid.(b) Shoots show negative Hydrotropism, / Roots show negative Phototropism.(c) Geotropism can be demonstrated by using a Clinostat.
58.	(a) 3:1 (b) 1:2:1 (c) Wrinkled seeds
59.	(a) More Transpiration

S.No.	Expected Answers
	(b) More Transpiration(c) Less Transpiration





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