



Delhi Public School, Howrah

PERIODIC TEST II (2025-2026)

Class-XI

Care must be taken not to write anything on the question paper. All the questions must be attempted in the correct sequence.

Time: -3 Hours

Subject: - Biology (Code No. 044)

F.M.-70

General Instructions:

- All questions are compulsory.
- The question paper has five sections and 33 questions. All questions are compulsory.
- Section-A has 16 questions of 1 mark each; Section-B has 5 questions of 2 marks each; Section-C has 7 questions of 3 marks each; Section-D has 2 case-based questions of 4 marks each; and Section-E has 3 questions of 5 marks each.
- There is no overall choice. However, internal choices have been provided in some questions. A student has to attempt only one of the alternatives in such questions.
- Wherever necessary, neat and properly labeled diagrams should be drawn.

SECTION A

Q. No. 1 to 12 are multiple choice questions. Only one of the choices is correct. Select and write the correct choice as well as the answer to these questions.

- If in glomerular capillaries, pressure of blood is 75 mm Hg, osmotic pressure of plasma proteins is 30 mm Hg, and hydrostatic pressure of fluid in renal tubule is 25 mm Hg then net force or the filtration pressure will be calculated as- 1
 - $75 + [30 - 20]$ mm Hg
 - $75 - [30 - 20]$ mm Hg
 - $75 - [30 + 20]$ mm Hg
 - $75 + [30 + 20]$ mm Hg
- Frog shows which kind of excretion? 1
 - Ammoniotelic in water and ureotelic on land
 - Uricotelic
 - Ureotelic
 - Ammoniotelic
- What is the primary reason for the short length of the alimentary canal in frogs? 1
 - Efficient absorption of nutrients
 - Carnivorous diet
 - Reduced need for digestion
 - Limited space in the body cavity
- Anjan wants to take a quick dip in a lake. He inhales as much air as possible before jumping in. What is the amount of air that Anjan inhales in excess of his usual breathing volume called? 1
 - Tidal volume
 - Inspiratory reserve volume
 - Residual volume
 - Expiratory reserve volume

5. Given below are the characteristics of a flower.
- Zygomorphic
 - Bisexual
 - Polysepalous calyx with three sepals
 - Polypetalous corolla with three petals arranged as two separate whorls
 - Six polyandrous stamens
 - Syncarpous gynoecium with six carpels and an inferior ovary

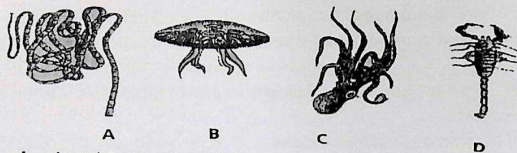
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Choose the correct floral formula for this flower.

- A. $\% \varnothing K_3 C_{2+1} A_{(6)} \overline{G}_6$
 B. $\% \varnothing K_3 C_{2+1} A_6 \overline{G}_{(6)}$
 C. $\odot \varnothing K_3 C_{3+3} A_6 \overline{G}_6$
 D. $\odot \varnothing K_{(3)} C_{(2)+(1)} A_6 \overline{G}_{(6)}$

6. The given figures (A–D) show four animals. Select the correct option with respect to a common characteristic of any two of these animals.

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- A. A and D respire mainly through body wall
 B. B and C show radial symmetry.
 C. A and B have cnidoblasts for self-defence.
 D. C and D have a true coelom.

7. A whale can inhale 20 litres of air per minute. He takes 12 breaths per minute. What is the tidal volume of the whale?

1

- A. 1667ml
 B. 240ml
 C. 500ml
 D. 667ml

8. *Magnifera indica* and *Azadirachta indica* belong to which of the following?

1

- A. Same genus
 B. Same species
 C. Same phylum
 D. Same family

9. How many statements from the following are correct for the Kingdom-Monera?

1

- I. Includes unicellular, colonial and filamentous prokaryotes.
 II. Bacteria reproduce only by fission.
 III. Nutritionally monerans are only photoautotrophs and saprophytes.
 IV. Some of the monerans can cause disease like Cholera, typhoid, tetanus etc.

- A. All are correct.
 B. I, II and III are correct.
 C. Only I is correct.
 D. I and IV are correct.

10. Maya has a cardiac output of 4500ml/min. Her heart rate is 90/min. What is the stroke volume of Maya's heart?

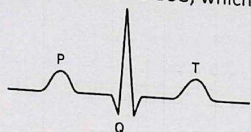
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- A. 70 ml
 B. 70 ml/min
 C. 50 ml
 D. 50 ml/min

- Which one of the following is the major difference between mosses and ferns?
- Ferns lack alternation of generation while mosses show the same.
 - Mosses are facultative aerobes while ferns are obligate aerobes.
 - Vascular bundles of ferns show xylem vessels while those of mosses lack it.
 - Sporophytes of ferns live much longer as compared to the Sporophytes of mosses.
12. At point Q in the ECG, which valve/(s) are most likely open?

1

1



- Both atrioventricular (AV) and semilunar valves.
- Only AV valves.
- Only semilunar valves.
- All valves are closed.

Question No. 13 to 16 consist of two statements – Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:

- Both A and R are true and R is the correct explanation of A.
- Both A and R are true but R is not the correct explanation of A.
- A is true but R is false.
- A is False but R is true.

13. **Assertion (A):** Living organisms are self-replicating, evolving and self-regulating units.

Reason (R): These are capable of responding to external stimuli.

14. **Assertion (A):** In potato plants, the corolla shows vexillary aestivation.

Reason (R): Corolla of the potato plant consists of five petals which are united.

15. **Assertion (A):** Cnidoblasts are present on the tentacles and the body in cnidarians.

Reason (R): Cnidoblasts are used for anchorage, defence and capture of the prey.

16. **Assertion (A):** Ultrafiltration takes place in presence of effective filtration pressure.

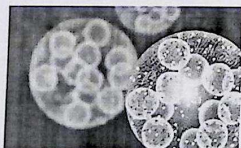
Reason(R): In ultrafiltration process, blood is filtered in Bowman's capsule, filtered fluid contain protein and blood corpuscles also.

SECTION B

17. Write the scientific name and the systematic hierarchy of the given organism.



18. Euglena has chloroplasts like plants but also shows animal-like movement. If you were asked to classify Euglena into either plant or animal kingdom, what problem would arise?
19. Mention two items that biologists agree are necessary to consider an organism "alive." For each, give an example of a non-living object that otherwise fits the definition of "alive."
20. A. What type of cell division would occur within the capsule of the *Polytrichum* sp?
- B. Develop a relation between the two pictures given below.



21. Attempt either option A or B.

- A. When a person is in an upright position, gravity causes the base of the lungs to be stretched downward more than the apex. How does this gravitational effect influence the distribution of airflow within the lungs during breathing?

OR

- B. How does the administration of 100 percent oxygen save a patient from carbon monoxide poisoning? Why wouldn't carbon dioxide work?

SECTION C

22. A. During fever, body temperature rises. How does this affect the position of the oxygen dissociation curve and why is this beneficial? 3

B. Draw a diagram of oxyhemoglobin dissociation curve.

23. A. Frog RBCs are nucleated, unlike those in mammals. How might the presence of a nucleus in RBCs influence oxygen transport efficiency compared to mammals? 3

B. If a frog's skin gets coated with an oily layer due to pollution, how would it affect its survival both in water and on land? Explain why.

24. The following table shows the osmolarity of the filtrate/tubular fluid in different parts of the nephron of a mammal: 3

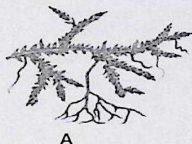
Nephron Part	Osmolarity (mOsm/L)
Proximal Convoluted Tubule	300
Descending limb (deep medulla)	1200
Ascending limb (thick)	200
Distal Convoluted Tubule	100
Collecting Duct (in medulla, ADH present)	1200

A. Why does the osmolarity increase in the descending limb but decrease in the ascending limb?

B. Which property of the ascending limb helps in creating the counter current multiplier?

C. If ADH is absent, what would be the approximate osmolarity of urine at the end of the collecting duct?

25. Riya and her friends along with their teachers went to Mussoorie on educational tour where they collected different types of pteridophytes. They are seedless vascular plants that generally occur in cool, damp and shady places. They observed the collected samples carefully. 3



A. Identify the plants A and B shown in the above figure.

B. With reference to A, which generation is dominant?

C. What is prothallus? Differentiate between the prothallus of A and B.

26. "Massive fish deaths were reported along the coastal belt due to red tides caused by a marine plankton P." 3



A. Identify P and name the kingdom to which P belong.

B. Why are red tides harmful to marine life?

C. Predict how this phenomenon might affect human communities living along the coast, both economically and ecologically.

Attempt either option A or B.

A. Give a diagrammatic representation of internal organs of frogs showing complete digestive system.

3

OR

B. Give a diagrammatic representation of male reproductive system of frog.

28. Mr. Das, 55 years old, is a chronic smoker. Recently, he feels breathless even during mild physical activity. His chest X-ray shows damaged alveolar walls, resulting in reduced surface area for gas exchange.

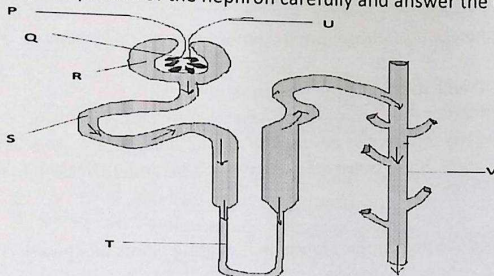
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- Which respiratory disorder is Mr. Das suffering from?
- How does the destruction of alveolar walls affect oxygen uptake?
- Why are smokers at higher risk of developing this condition?

SECTION D

29. Observe the given picture of the nephron carefully and answer the following questions:

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- If P constricts more than U in the glomerulus, what would be the effect on the glomerular filtration rate (GFR)? Explain.
- If a toxin affects part T, how will it impact the concentration of urine?

Attempt either subpart C or D

- A patient is diagnosed with renal calculi due to calcium oxalate crystals. Which part of the nephron as shown in the diagram might show obstruction due to this condition, and what could be the consequences?

OR

- If glucose is detected in the urine, which labeled part (as shown in given diagram) is most likely malfunctioning? Give reason for your answer.

30. A 45-year-old man complains of unexplained fatigue, swelling in the legs, and mild shortness of breath. His blood test and additional diagnostic results are as follows:

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BLOOD TEST REPORT

Parameter	Result	Normal Range
Hemoglobin (Hb)	13.5 g/dL	13–17 g/dL
RBC Count	5.2 million/mm ³	4.5–5.5 million/mm ³
WBC Count	7,800 /mm ³	4,000–10,000 /mm ³
Platelet Count	1.2 lakh/mm ³	1.5–4.5 lakh/mm ³
Serum Albumin	2.4 g/dL	3.4–5.4 g/dL
Sodium (Na ⁺) Level	128 mEq/L	135–145 mEq/L
Blood Urea Nitrogen (BUN)	35 mg/dL	7–20 mg/dL

- Despite normal hemoglobin and RBC levels, the patient shows fatigue and swelling. Which parameters point to a possible kidney dysfunction, and how?
- The platelet count is significantly reduced. How could this affect the patient's circulatory system, and what signs would indicate this in real life?

Attempt either subpart C or D

C. Explain how low serum albumin levels contribute to edema (swelling), even though there is no direct vascular blockage.

OR

D. The WBC count is within the normal range, yet the patient experiences frequent infections. Suggest a possible reason why infections may still occur despite a normal WBC count.

SECTION E

31. Attempt either option A or B.

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- A. i. Identify the phylum in which adults exhibit radial symmetry and larva exhibit bilateral symmetry.
- ii. Endoparasites are found inside the host body. Write the special structure possessed by these and which enable them to survive in those conditions. (Write four points)
- iii. Represent the classification of the subphylum *Vertebrata* into its major groups using a flow chart.

OR

- B. i. What is metagenesis? State an example which exhibits this phenomenon.
- ii. How does the evolution of the coelom relate to the complexity of animal body plans? Explain.
- iii. Prepare a comparative chart highlighting the differences among the phyla Coelenterata, Annelida, and Echinodermata with respect to digestive system, body symmetry, segmentation, and distinctive features.

32. Attempt either option A or B.

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A. Describe the various types of placentation (with example) found in flowering plants along with the diagrams.

OR

B. Describe the types of flowers based on the position of ovary and floral parts on thalamus along with the diagrams and example.

33. Attempt either option A or B.

5

A. I. A 68-year-old woman suddenly experienced paralysis on one side of the body due to blockage of a blood vessel in the brain.

- i) What is this medical condition called?
- ii) How is it related to disorders of blood circulation?
- iii) Suggest two preventive steps for reducing its occurrence.

II. What is the significance of the hepatic portal system in the circulatory system?

OR

B. I. A 60-year-old man experiences sudden shortness of breath and swelling in his legs. His echocardiogram shows the heart is not pumping blood efficiently.

- i) Name the medical condition.
- ii) Which side of the heart is most likely failing if the patient has pulmonary congestion?
- iii) Suggest any two lifestyle changes that can help manage this condition.

II. What chemical events take place during blood clots in order to seal the wound?