

General Instructions

- (i) All questions are compulsory.
- (ii) The question paper has five sections and 33 questions. All questions are compulsory.
- (iii) 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.
- (iv) 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.
- (v) Wherever necessary, neat and properly labelled diagrams should be drawn.

SECTION A (1 Marker)

1. Mitosis results in producing two cells which are similar to each other. What would be the consequence, if each of the following irregularities occur during mitosis?
 - i) Duplication of DNA does not occur
 - ii) Cytokinesis does not occur

Fill in the blanks

2. The bacteria which are found in paddy fields are called _____
3. The excretory organ in *Balanoglossus* is _____
4. _____

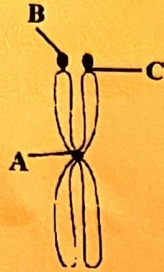


Identify the body form and give one example of the organism exhibiting such body form.

5. List two factors that contribute for the dissociation of oxy-haemoglobin in the arterial blood.

6. Which bacteria are most abundant in nature? Give one importance of such bacteria in the field of medicine.
7. The heart rate of an athlete is 90 beats per minute. Calculate the cardiac output of the athlete.

8.



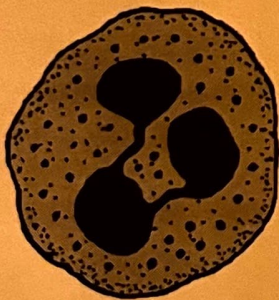
- a) Label C
- b) Identify the type of chromosome.

9.



Y contains a rasping organ. What is it called and mention its function.

10.



Identify the human blood cell type. Mention its function.

11. X \Rightarrow Transport vesicle containing enzyme \Rightarrow Golgi apparatus \Rightarrow Y \Rightarrow autophagy
Identify X and Y.

12. Give two examples of basidiocarp bearing saprophytic fungi.

ASSERTION REASON BASED QUESTIONS (Ques13-Ques16)

Answer these questions selecting the appropriate option given below:

- a) Both A and R are true and R is the correct explanation of A
 - b) Both A and R are true and R is not the correct explanation of A
 - c) A is true but R is false
 - d) Both A and R are false
13. Assertion : Archaeobacteria are able to survive in harsh habitats.
Reason : Archaeobacteria survive in extreme conditions due to the presence of peptidoglycan in their cell wall.
14. Assertion : Fungi are cosmopolitan.
Reason : They prefer to grow in warm and humid places.

OR

14. Assertion : Aschelminthes are called pseudocoelomates.
Reason : In aschelminthes, mesoderm is present as scattered pouches in between ectoderm and endoderm.
15. Assertion : The cardiac output of an adult athlete and an ordinary man is mostly the same.
Reason : It is not possible to change the stroke volume and heart rate.
16. Assertion : Over two-thirds of all named species on earth are arthropods.
Reason : They are bilaterally symmetrical, triploblastic, segmented and coelomate animals.

SECTION B (2 Markers)

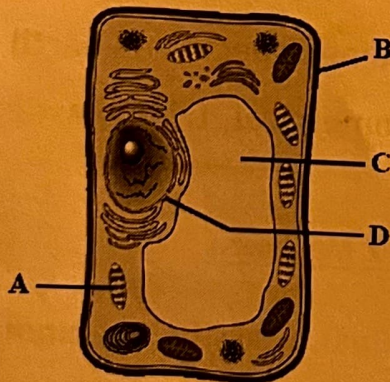
17. Observe the given picture of the animal. Classify it. Comment on its mode of reproduction and development.



18. Many Platyhelminthes are found as endoparasites. Give an example and list the features that help them survive as parasites.
19. Onion root tip cells has 14 chromosomes in each cell.
- How many chromosomes will the cell have at G1 phase, at G2-phase and metaphase phase?
 - If the DNA content after M-phase is 2C, would have been the DNA content of the cells at G1, after S and at G2?
20. a) Mention the role of the 'part' of the respiratory system starting from external nostrils till terminal bronchioles.
- b) Why does exchange of gases occur only in the alveoli and not any other part of the respiratory system?
21. Distinguish between—
- Chromoplast and Leucoplast(with respect to pigment and function)
 - 80S and 70S ribosomes

OR

21. Identify two structures that are unique to the cell depicted below. How does part C help the cell?



SECTION C (3 Markers)

22. Give reason for the following—
- Atrial systole precedes the ventricular systole.
 - Two kingdom classification was inadequate and ambiguous.
 - Vital capacity is considerably reduced in chronic smokers.

23. A cell with 8 chromosomes undergoes gametogenesis. Illustrate the bivalent chromosomes at diplotene stage and metaphase-I stage.

24. *Basidiomycetes* grows on soil, on logs and tree stumps, its mycelium is branched and septate and does not reproduce asexually. How does it reproduce sexually? Explain.

OR

24. a) What are the two different ways by which fungi live as symbionts? How are they different from each other?

b) Give two economic importance of fungi like, *Alternaria* and *Trichoderma*. [2+1]

25. a) With the help of diagram only, explain the conducting system of heart beat in humans.

b) What do you understand by congestive heart failure? [2+1]

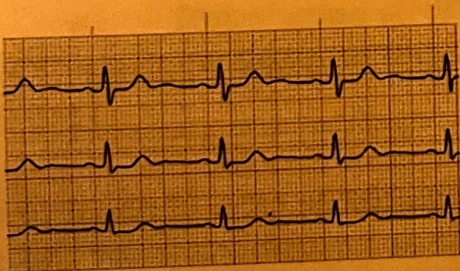
26. a) Differentiate between Poikilotherms and Homoiotherms.

b) Draw a schematic sketch of a chordate mentioning the typical chordate Features. [1+2]

27. a) How does cytokinesis in plant cells differ from animal cells?

b) When is a recombination nodule formed in the homologous pair? What is its significance? [2+1]

28.

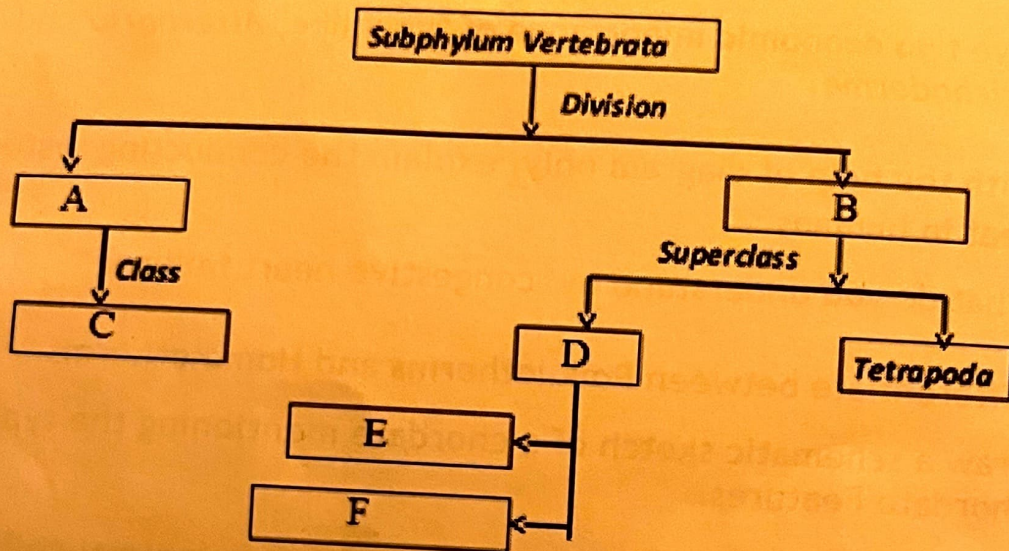


a) How can one determine the rate of heartbeat based on the above illustration?

b) Draw a standard electrocardiogram. Write the significance of each Wave. [1+2]

Section D (Case based) 4 Marker

29. Vertebrates are among the most recognizable organisms of the animal kingdom. More than 62,000 vertebrate species have been identified. The vertebrate species now living represent only a small portion of the vertebrates that have existed. The best-known extinct vertebrates are the dinosaurs, a unique group of reptiles, which reached sizes not seen before or after in terrestrial animals. Given is the flowchart for division of subphylum vertebrata.



Answer the following questions based on the above classification.

- Identify A and B
- Write four unique features of class C.
- Which class of Tetrapods have dry cornified skin? What are the epidermal scales called?
[1+2+1]

Rekha's sister has come from a nearby village to the city, Chennai to consult a doctor. She has a five year old daughter and is pregnant for the second time. Rekha explains to her all about blood group and Rh incompatibility. She comforts her saying medicines are available to take care of consequences of incompatibility.

- What complications may arise during the second pregnancy?
- How could this complication be avoided?
- Why would there be no complications during the first pregnancy?
[2+1+1]

Section E (5 Marker)

31. a) List advanced features of Mammals over Aves.
b) Mention two advanced features of Echinoderms.
c) Illustrate pseudocoelomate condition? [2+2+1]

OR

31. a) With the help of examples, compare phylum Aschelminthes with Annelida.
b) List adaptive features of Aves that help in their habitat.
c) Illustrate diploblastic organisation. [2+2+1]
32. a) Both lysosomes and vacuoles are endomembrane structures, yet they differ in terms of their function. Comment.
b) Chloroplast in a eukaryotic cell may have originated from a bacterial invasion. Which features of chloroplast support the suggestion. Explain.
c) What is the arrangement of axonemal microtubule in the flagellum? [2+2+1=5]

OR

32. a) Name the following-
- An elaborate network of filamentous proteinaceous structures present in the cytoplasm.
 - Disc shaped structures on the sides of the centromere
- b) Explain why the universal biomembrane is called fluid mosaic?
c) Compare the cell wall of bacteria, fungi and plants. [1+2+2]
33. a) Give the scientific names of following—
- A flagellated protozoan
 - The parasitic fungi on mustard
- b) Who coined the term virus? How are they different from viroids?
Name one disease caused by viroids.

c) Give reasons for the following-

a) The appearance of red tides.

b) Kingdom Protista forms a connecting link between Kingdom
Plantae, Animalia and fungi. [1+2+2]

OR

33. a) Name the following-

- Specialized cells in cyanobacteria where atmospheric nitrogen is fixed.
- The chief 'producers' in the oceans.

b) Compare cell walls of diatoms with dinoflagellates.

c) Illustrate a ciliated protozoan. [1+2+2]