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ANNUAL EXAMINATION (2022 – 2023)

Subject: Biology(044)
Class : XI

MM: 70
Time:3 Hrs.

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 labeled diagrams should be drawn.

SECTION A

1. Each part of plant breathes on its own. Roots of plants in haline marshy soil getsuffocated if these do not have
 - a. Mycorrhizae
 - b. Pneumatophores
 - c. Haustoria
 - d. Rhizoids
2. Given below are some bacteria and their shapes. Select the correct match

	Bacteria		Shape
A	Lactobacillus	i	Comma
B	Streptococcus	ii	Spherical
C	Vibrio cholerae	iii	Rod
		iv	Spiral

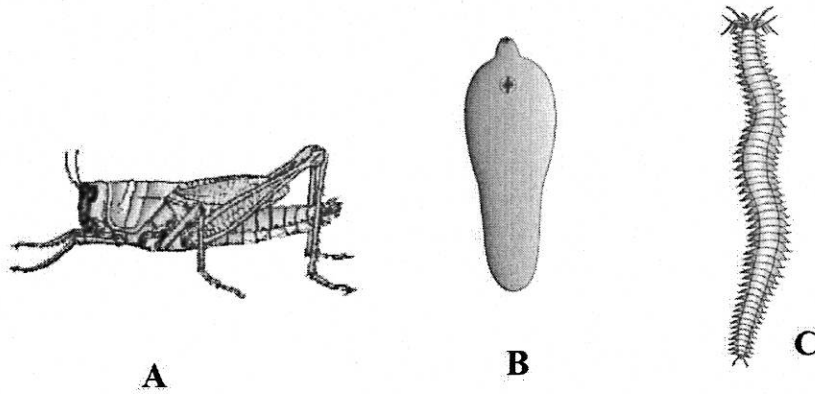
- a. A-i, B-ii, C-iv
 - b. A-iii, B-ii, C-i
 - c. A-iii, B-iv, C-ii
 - d. A-ii, B-iii, C-iv
3. Given below are different sub-stages of prophase I. Match them with their correctfeature.

	Column I		Column II
I	Zygotene	i	Formation of bivalent
II	Pachytene	ii	Terminalization of chiasmata
III	Diakinesis	iii	Dissolution of synaptonemal complex
IV	Leptotene	iv	Crossing over mediated by recombinase
V	Diplotene	v	Chromosomes start condensing

- a. I-v, II-i, III-iv, IV-iii, V-ii
- b. I-i, II-iii, III-ii, IV-v, V-iv
- c. I-i, II-iv, III-ii, IV-v, V-iii
- d. I-v, II-iv, III-ii, IV-i, V-iii

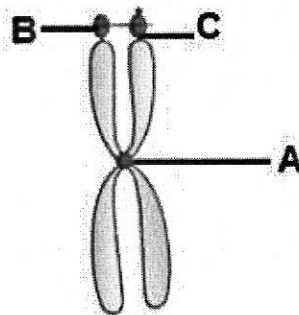
4. Which of the following cells of an adult will **NOT** exhibit mitosis?
- Blood cells
 - Cells lining the gut
 - Heart cells
 - Cells of upper layer of epidermis
5. Choose the **INCORRECT** statement/statements.
- Gelidium* belonging to class Rhodophyceae yields Agar.
 - Chlorella* belonging to class Phaeophyceae is a rich source of protein.
 - Laminaria* belonging to class Phaeophyceae is used as sea food.
 - Porphyra* belonging to class Chlorophyceae is used in preparation of ice creams.
6. Circular DNA is found in
- i only
 - iii only
 - ii and iii
 - ii and iv
7. A pregnant female delivers a baby who suffers from stunted growth, mental retardation, low intelligence quotient and abnormal skin. This may be because of
- low secretion of growth hormone
 - cancer of thyroid gland
 - over secretion of pars distalis
 - deficiency of iodine in diet.
8. In resting state, sodium-potassium pump transports
- three sodium ions outside for two potassium ions into the cell
 - two sodium ions outside for three potassium ions into the cell
 - three sodium ions outside for three potassium ions into the cell
 - two sodium ions outside for two potassium ions into the cell
9. During non-cyclic photophosphorylation water acts as a/an
- reducing agent
 - oxidizing agent
 - phosphorylating agent
 - stabilising agent
10. Which of the following combinations of hormones binds with intracellular receptors?
- Insulin, FSH, Cortisol
 - Glucagon, Testosterone, FSH
 - Thyroxine, Testosterone, Estradiol
 - Insulin, Androgen, PTH

11. Given below are the figures of a few organisms. Find the correct option with respect to their excretory organs.



- a. A- Malpighian tubules, B- flame cells, C- nephridia
- b. A – green gland, B - nephron, C- nephridia
- c. A – Malpighian tubules, B- nephridia, C- flame cells
- d. A – flame cells, B – nephridia, C – nephron

12. What does A, B and C represent in the given figure?



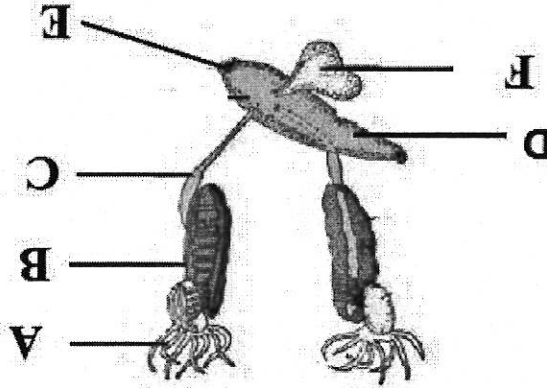
A B C

- a. Centriole Telomere Primary constriction
- b. Centriole Satellite Secondary constriction
- c. Centromere Satellite Secondary constriction
- d. Centromere Telomere Primary constriction

- Name the non-membrane bound organelle found in both prokaryotic and eukaryotic cells. Differentiate between the two.
19. A student visited a zoological park and saw panthera Tigris printed on a placard outside the tiger enclosure. As a biology student identify the errors he observed in this name. Who proposed this naming system?
20. a) The partial pressure of oxygen in the atmospheric air drops in bronchioles even before exchange begins in alveoli. Justify.

OR

18. Write the significance of this feature in an organism.
18. Which biomolecules are responsible for providing fluidity to plasma membrane.
- Common duct for urine and sperm.
 - Common opening for egestion and excretion.
 - Organ which stores urine temporarily.
 - Organ which stores undigested food.



17. Based on the clues given below, identify and name the organ marked in the given figure

SECTION B

13. Assertion: Mitochondria of active cell has more number of cristae and F₀-F₁ particles.
Reason: F₀-F₁ particles are involved in ATP production.
14. Assertion: The axon terminals contain neurotransmitter filled vesicles.
Reason: These neurotransmitters can help in the transmission of impulse in any direction.
15. Assertion: Pruning enhances growth of lateral branches.
Reason: Pruning promotes ethylene production.
16. Assertion: Viruses are obligate parasites.
Reason: They are inert outside their specific host cells.
- 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 and R is not the correct explanation of A.
 - A is true but R is false.
 - A is false but R is true.

b) Diksha was practicing breathing exercises (*Pranayam*). She exhaled forcibly and then inhaled the maximum amount of air she could. Which pulmonary capacity is being measured. Calculate the volume of air she could inhale.

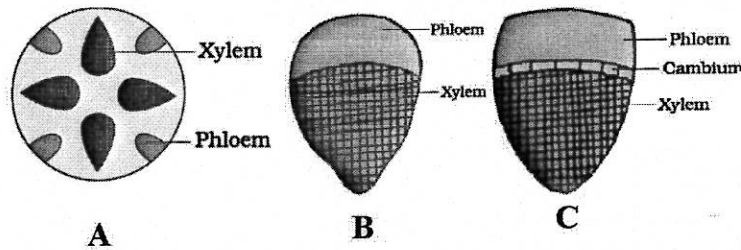
21. Neha observed the growth pattern in a stem of plant and recorded her observations as

	Day 1	Day 2	Day 3	Day 4	Day 5
Stem length (in cm)	4	6	8	10	12

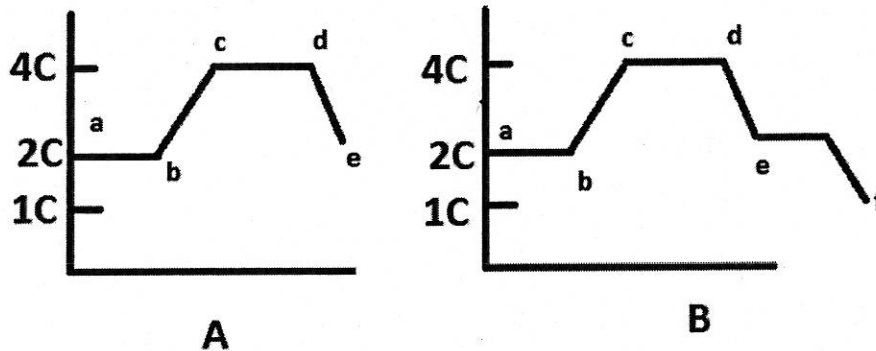
- Identify the type of growth pattern observed.
- Write its mathematical expression.

SECTION C

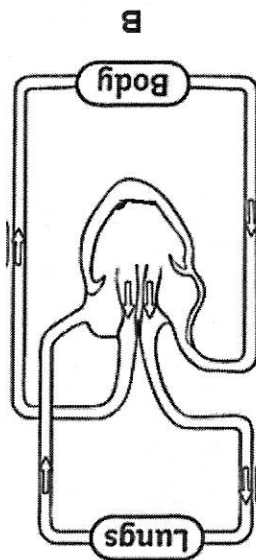
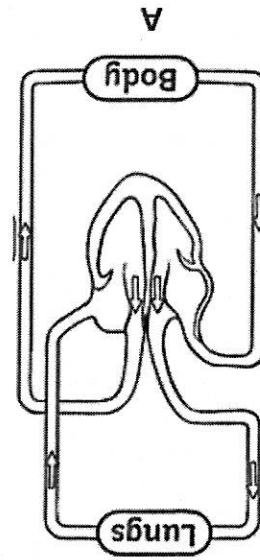
22. In the following figures showing vascular bundles



- Identify the type A, B and C.
 - Name the type of the plant and the plant part in which the above are found.
23. Compare any three classes of Kingdom Fungi on the basis of their mycelium and mode of asexual reproduction.
24. Study the graphs shown below for DNA content in a normally dividing cell till the division is completed. Answer the following questions.



- Identify the type of cell division depicted in A and B.
 - Which line segment represents the S phase. Justify.
25. To prepare respiratory balance sheet of glucose oxidation, it is assumed that no intermediate compound enters or exits the pathway. During certain circumstances, a glycerol molecule enters as DHAP. Calculate the gross ATP molecules produced by DHAP molecule.



29. Observe the diagram and answer the questions that follow.

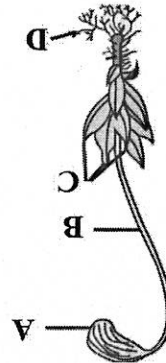
Q. 29 and 30 are case based questions. Each question has subparts with internal choice in one subpart.

SECTION D

28. Give reasons
 a. *Scotiodon* needs to swim constantly.
 b. Birds have pneumatic bones.
 c. *Platyus*, though oviparous, is a mammal.
 Describe the major structural forms of joints in human body

OR

27. Explain the mechanism of sliding filament theory.
 a. Label the parts B, C and mention their ploidy.
 b. State the functions of parts A and D.



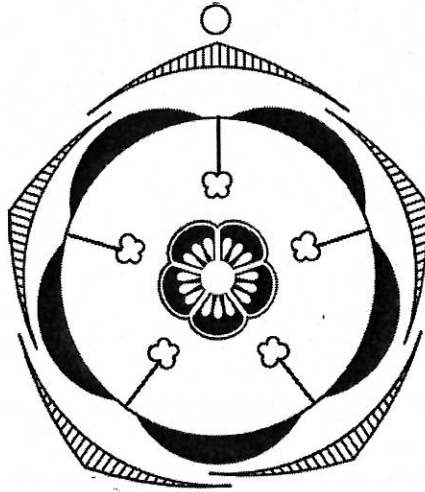
26. In the plant figure shown below

- Name the structure which is present in A but absent in B.
- Which group of organisms has type A and which group has type B type of circulation?
- What could be the possible disadvantage of type B circulation?

OR

Prepare a flow chart representing the type of circulation shown in type A.

30. Given below is a floral diagram.



- Identify the aestivation shown in the calyx and corolla of the above flower.
- Name the type of placentation seen in its ovary. Give example of a flower showing such placentation.
- Write the floral formula of the given flower.

OR

Enlist four characteristics of its androecium.

SECTION E

31. Diagrammatically represent the Hatch and Slack Pathway.

OR

Diagrammatically represent the chemiosmotic hypothesis of chloroplast.

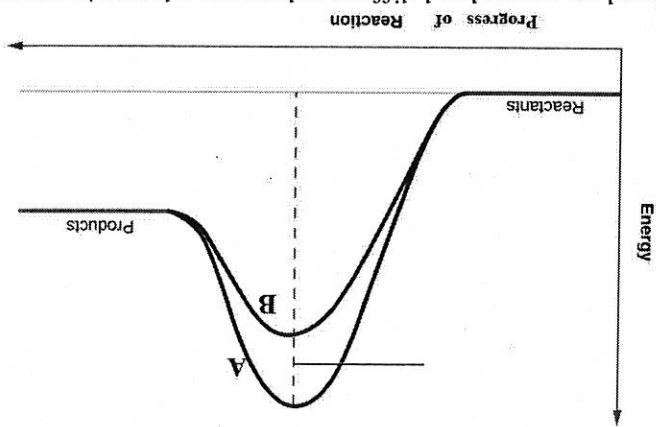
32. a) Give the polarity of x and x' in the line diagram of DNA double helix given below.

- If a DNA fragment has 800 bp in it, calculate the length of DNA in Angstrom.
- If a DNA fragment of 1000 bp has 400 Adenine nitrogen bases, calculate the amount of Guanine, Thymine and Cytosine in it.
- Give one structural difference in the building block of DNA and RNA.



Observe the given graph showing a chemical reaction taking place in the presence and absence of an enzyme.

OR



a) Based on energy level difference between substrate/reactant and product,

identify the type of reaction.

b) Which of the two curves depicts the reaction catalysed by enzyme? Give

reason.

c) If a chemical closely resembling the substrate is added to the reaction,

which of the curves in the graph will be affected and why?

33. Kidneys of mammals have special arrangement for conserving water.

a. Discuss the structural arrangement which facilitates this water conservation.

b. Explain the mechanism that helps in the production of concentrated urine.

OR

Kidneys have built-in mechanism for regulation of their function.

a. Explain the regulatory apparatus present in kidney.

b. With the help of flow chart explain its regulatory mechanism.
