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Candidates must write the Set No. on the title page of the OMR Sheet.

DAV PUBLIC SCHOOLS, ODISHA ZONE –I
PA-II EXAMINATION, 2021-22

- Check that this question paper contains 14 printed pages.
- Set number given on the right hand side of the question paper should be written on the OMR SHEET by the candidate.
- Check that this question paper contains 60 questions.

CLASS – XI

SUB: BIOLOGY(044)

Time: 90 Minutes

Maximum Marks: 35

General Instruction:

- 1. The Question Paper contains three sections.*
- 2. Section A has 24 questions. Attempt any 20 questions.*
- 3. Section B has 24 questions. Attempt any 20 questions.*
- 4. Section C has 12 questions. Attempt any 10 questions.*
- 5. All questions carry equal marks.*
- 6. There is no negative marking.*

SECTION -A

Section–A consists of 24 questions (Q.No.1 to 24). Attempt any 20 questions from this section. The first attempted 20 questions would be evaluated.

Q1. The scientific name of mango plant is correctly written as:

- A. *Mangifera indica*
- B. *Mangifera indica*
- C. *Mangifera indica*
- D. Mangifera indica

Q2. Term systematics was used by Linnaeus. It includes:

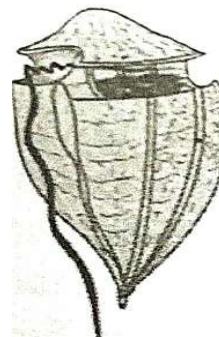
- A. diversity of organisms
- B. taxonomy and phylogeny
- C. both A & B
- D. none of the above

Q3. Which of the following bacteria play an important role in the recycling of nutrients like nitrogen, phosphorus, iron and sulphur?

- A. Chemoheterotrophic bacteria
- B. Chemosynthetic autotrophic bacteria
- C. Parasitic bacteria
- D. Saprophytic bacteria

Q4. Refer to diagram given alongside and select the incorrect option regarding it.

- A. It belongs to kingdom-Protista and is a dinoflagellate.
- B. It is mostly marine, photosynthetic with colour depending on the main pigment present in its cells.
- C. These organisms release toxins in large amount and kill other marine animals.
- D. They have two flagella, a short and a long one.



Q5. Which one of the following organisms is scientifically incorrectly named and incorrectly described?

- A. *Plasmodium* -A Protozoan pathogen causing malaria.
- B. *Trypanosoma* -The parasite of sleeping sickness.
- C. *Euglena*-A Chrysophyte, which shows bioluminescence.
- D. Lichens-Very good pollution indicators.

Q6. In fungi, the various types of spores are produced in distinct structures known as:

- A. spore sac
- B. fruiting body
- C. peristome
- D. pollen sac

Q7. In fungi, the fusion of protoplasm between two motile or non-motile gametes is called:

- A. plasmokinesis
- B. karyogamy
- C. cytokinesis
- D. Plasmogamy

Q8. Which one of the following Classes consists of coenocytic, multinucleate and aseptate mycelium?

- A. Phycomycetes
 B. Basidiomycetes
 C. Ascomycetes
 D. Deuteromycetes

Q9. Viroids differ from viruses in having:

- A. DNA molecules with protein coat.
 B. DNA molecules without protein coat.
 C. RNA molecules without protein coat.
 D. RNA molecules with protein coat.

Q10. In a bryophyte, the sporophyte

- A. produces gametes that give rise to the gametophytes.
 B. is partially parasitic on the gametophyte.
 C. arises from a spore produced from the gametophyte.
 D. manufactures food for itself, as well as for the gametophyte.

Q11. Choose the animals that belong to phylum— Echinodermata from the options.

- A. Sea urchin, cuttlefish and sea lily
 B. *Echinus*, sea hare and sea cucumber
 C. *Ophiura*, *Chaetopleura* and *Echinus*
 D. *Antedon*, *Ophiura* and *Echinus*

Q12. In .. ‘a’... type of inflorescence, the main axis terminates in a flower, hence is limited in growth and flowers are borne in .. ‘b’... succession. Choose the correct option to replace ‘a’ and ‘b’.

‘a’	‘b’
A. Racemose	acropetal
B. Racemose	basipetal
C. Cymose	basipetal
D. Cymose	acropetal

Q13. Find out the correct match.

‘a’	‘b’
A. Staminode	Fertile Stamens
B. Free stamens	Polyandrous
C. Stamens attached to petals	Epiphyllous
D. Stamens attached to perianth	Epipetalous

Q14. The endothelium of blood vessels is made up of simple:

- A. cuboidal epithelium
 B. columnar epithelium
 C. ciliated columnar epithelium
 D. squamous epithelium

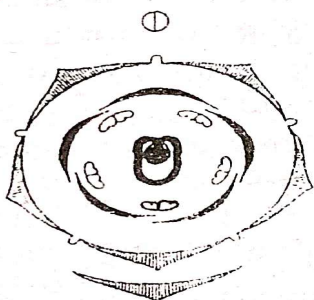
Q15. Each muscle is made up of long, cylindrical fibres arranged in parallel arrays. These fibres are composed of numerous fine fibrils called

- A. myofibrils
 B. microfilaments

C. fibroblasts

D. None of these

Q16. Choose the correct description of the flower depicted in the floral diagram given below:

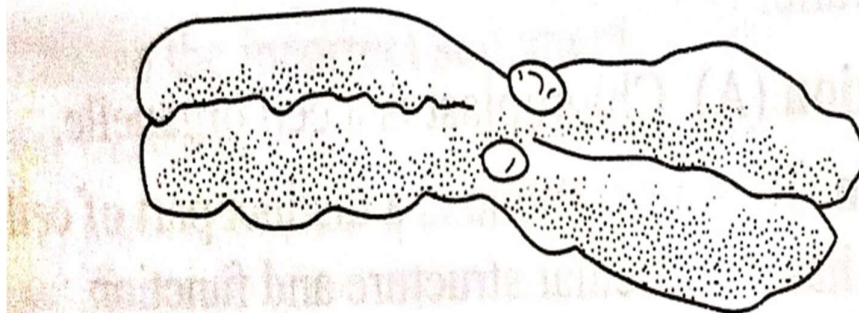


- A. United, valvate sepals; free, twisted petals; free stamens; unilocular ovary with marginal placentation.
- B. United, valvate sepals; free, imbricate petals; free stamens; unilocular ovary with axile placentation.
- C. United, valvate sepals; free, imbricate petals; free stamens; unilocular ovary with marginal placentation.
- D. United, valvate sepals; free, imbricate petals, epipetalous stamens; unilocular ovary with marginal placentation.

Q17. Given below are the sites of Protein synthesis in a eukaryotic cell. Select from the options, the correct sites of protein synthesis.

- A. cytoplasm only
- B. cytoplasm, mitochondria and chloroplast
- C. ribosomes attached on nuclear envelope only
- D. nucleolus and cytoplasm both

Q18. The below diagram shows a chromosome.



Which of the following options refer correctly to the chromosome?

Options	Number of Centromere	Number of Kinetochores	Number of Arms
A.	2	1	4
B.	2	2	4
C.	1	2	2
D.	1	2	4

Q19. A piece of carrot and a flower is put in water separately. The water became coloured in case of carrot but remained colourless in case of flower. Use this

information and select the correct option.

- A. In carrot, some pigments are found in cell sap which are water soluble.
- B. In flowers, pigments are found in chromoplast which are fat soluble and do not come out in water
- C. Both A and B.
- D. In both carrot and flower, pigments are found in cytoplasm.

Q20. A living cell which can undergo both aerobic and anaerobic respiration is placed under anaerobic condition permanently. Find out what will be the consequence.

- A. Mitochondria will multiply.
- B. Mitochondria will disappear.
- C. ER will disappear.
- D. Mitochondria and ribosomes multiply rapidly.

Q21. Based on the number of amino groups and carboxyl groups, amino acids are classified. Choose the correct option.

Options	Acidic amino acids	Basic amino acids	Neutral amino acids
A.	Lysine	Valine	Glutamate
B.	Glutamate	Valine	Lysine
C.	Lysine	Glutamate	Valine
D.	Glutamate	Lysine	Valine

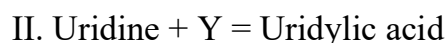
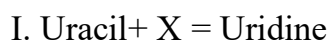
Q22. In plant cells, the number of Golgi bodies increases during:

- A. cell division
- B. food synthesis
- C. translocation
- D. respiration

Q23. If the seta of Funaria has 10 chromosomes, then find out the number of chromosomes present in primaryprotonema?

- A. 10 chromosomes
- B. 15 chromosomes
- C. 5 chromosomes
- D. 20 chromosomes

Q24. Examine the given reactions.



Find out correct option for X and Y

- A. X—Phosphate group, Y—Sugar molecule
- B. X—ribose molecule, Y—Phosphate group
- C. X—Nitrogenous base, Y—Sugar molecule
- D. X—deoxy ribose molecule, Y— Phosphate group

SECTION -B

Section – B consists of 24 questions (Q.No.25to48). Attempt any 20 questions from this section. The first attempted 20 questions would be evaluated.

QuestionNo.25to28consist of two statements —Assertion(A) and Reason(R). 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. A is False but R is true

Q25. Assertion (A): Coenzyme is a protein group without which certain enzymes are inactive or incomplete.

Reason (R): Coenzymes attached to apo-enzyme during the course of catalysis.

Q26. Assertion (A): Amphibians cannot survive in sea water.

Reason (R): Amphibians have lungs for breathing on land which would collapse under the water pressure of the sea.

Q27. Assertion (A): Algae are the primary producers of many food chains.

Reason (R): Half of the total carbon dioxide fixation on earth is carried out by algae.

Q28. Assertion (A) Squamous epithelium is also known as glandular epithelium.

Reason (R) Cells of columnar epithelium form the lining of the stomach.

Q29. Which features are common to the animals belonging to class—Amphibia and class—Reptilia?

A. The presence of tympanum, poikilotherms and usually three-chambered heart.

B. The presence of scales with internal fertilisation and usually four-chambered heart.

C. The presence of cloaca, oviparous and external fertilisation

D. The presence of moist skin .

Q30. Select the mismatch.

A. Chlorophyceae- Laminarin

B. Salvinia – Heterosporous

C. Rhodophyceae- Floridean Starch

D. Equisetum – Homosporous

Q31. Zygotic meiosis is characteristic of

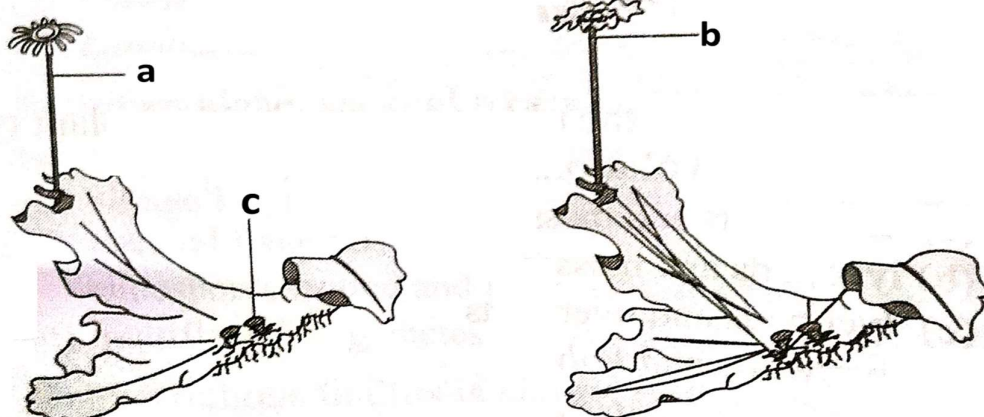
A. Marchantia

B. Chlamydomonas

C. Fucus

D. Funaria

Q32. Observe the diagrams given below and choose the correct option for a, b and c.



- A. a—Antheridiophore, b—Archegoniophore, c—Endospore
- B. a—Antheridiophore, b—Archegoniophore, c-Gemma cup
- C. a—Archegoniophore, b- Antheridiophore, c—Seta
- D. a—Archegoniophore, b—Antheridiophore, c—Gemma cup

Q33. In the cardiac muscles,

- A. contraction of one cell does not affect the other cells.
- B. intercalated discs prevent the communication among cardiac cells.
- C. cell junctions fuse the plasma membrane of adjacent cells.
- D. All of the above.

Q34. In the alternation of generation, the sporophytic generation is ...a... and the gametophytic generation is ...b... . Here, 'a' and 'b' refer to

- A. a-n, b-2n
- B. a-2n,b-n
- C. a-n, b- n
- D. a-2n, b-2n

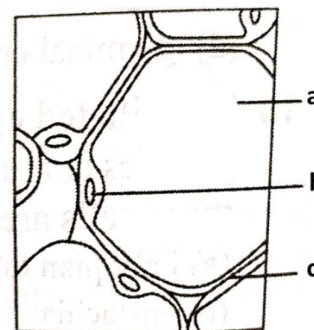
Q35. Consider the following four statements (i) - (iv) and select the correct option indicating which ones are true (T) and which ones are false (F).

- i. Cuboidal epithelium is present in tubular part of nephron in the kidney.
- ii. Simple epithelium covers the dry surface of the skin, the moist surface of buccal cavity, pharynx, inner lining of ducts of salivary glands and of pancreatic ducts.
- iii. The wall of internal organs such as the blood vessels, stomach and intestine contains skeletal muscles.
- iv. Bone marrow in some bones is the site of production of blood cells.

Options	i	ii	iii	iv
A.	F	F	T	T
B.	T	T	F	F
C.	T	E	T	F
D.	T	F	F	T

Q36. Observe the diagram of adipose tissue given alongside and identify a, b and c in it.

- A. a-Fat storage area, b- Nucleus, c- Plasma membrane
- B. a-Cytoplasm, b-Nucleus, c-Cell wall
- C. a-Fat storage area, b- Mast cell, c- Plasma membrane
- D. a-Tissue fluid, b- Collagen fibres, c-Plasmalemma



Q37. Choose the incorrect pair.

- A. Actinomorphic flower—Mustard
- B. Valvate aestivation —No overlapping of sepals or petals; Calotropis
- C. Twisted aestivation—Overlapping margins, but not in a particular direction; Cotton
- D. Vexillary aestivation ---- Observed in pentamerous flower; Pea

Q38. Suppose you added hypotonic solution to the culture of *Amoeba* and human blood smear.

And following may be your observations.

- i. Human RBC will survive but *Amoeba* will burst.
- ii. *Amoeba* will survive but human RBC will burst.
- iii. As *Amoeba* has contractile vacuoles, it will survive.
- iv. As *Amoeba* has a rigid wall, it will survive.

Find out which statements are correct based on your observation.

- A. (i) & (iii)
- B. (ii) & (iii)
- C. (ii) & (iv)
- D. (iii) & (iv)

Q39. Select the option, which is not correct with respect to enzyme action.

- A. Substrate binds with enzyme at its active site.
- B. Addition of a lot of succinate reverses the inhibition of succinic dehydrogenase by malonate.
- C. Malonate is a competitive inhibitor of succinic dehydrogenase.
- D. A non-competitive inhibitor binds the enzyme at the active site.

Q40. Arachidonic acid and palmitic acid have ---- & ----- carbon atoms, respectively including the carboxyl carbon.

Complete the given statement by filling the most appropriate option in the blank.

- A. 22, 15
- B. 21, 14
- C. 20, 16
- D. 23, 10

Q41. Point out the wrong matching.

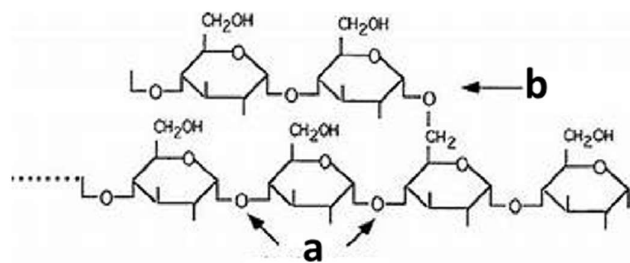
- A. Lysosome–Cellular digestion
- B. Ribosome - Carbohydrates
- C. Plastid - Photosynthesis
- D. Nucleolus –RNA Synthesis

Q42. Choose the correct statement/statements.

- i. Bond energy (ATP) is utilised for biosynthesis, osmotic and mechanical work that we perform.
- ii. When glucose is degraded into lactic acid in our muscles, energy is liberated.
- iii. Assembly of a protein from amino acid requires energy.
- iv. Majority of metabolic reactions can occur in isolation.
- v. There are many examples of uncatalysed metabolic reactions in a living system.

- A. iv and v B. i and iii C. i only D. i, ii and iii

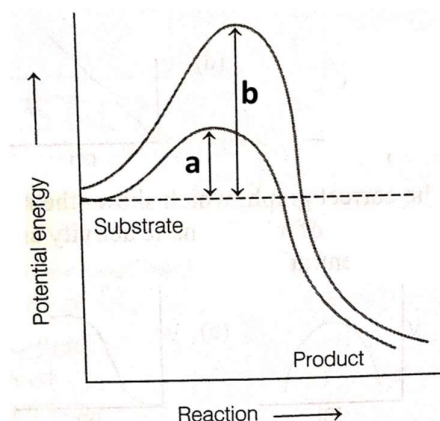
Q43. Identify 'a' and 'b' bonds in the following diagrammatic representation of a portion of glycogen.



Choose the correct option.

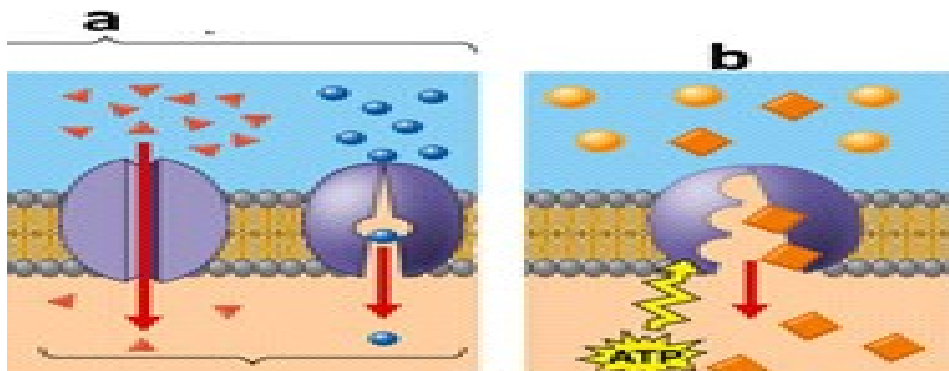
- A. a= 1,4-glycosidic bonds, b = 1,6-glycosidic bonds
- B. a= 1,6-glycosidic bonds, b = 1,4-glycosidic bonds
- C. a = 1,1-glycosidic bonds, b = 1,1-glycosidic bonds
- D. a = 1,4-glycosidic bonds, b =1,4-glycosidic bonds

Q44. Which of the following describes the given graph correctly?



- A. Endothermic reaction with energy-**a** in the presence of enzyme and **b** in the absence of enzyme.
- B. Exothermic reaction with energy-**a** in the presence of enzyme and **b** in the absence of enzyme.
- C. Exothermic reaction with energy-**a** in the absence of enzyme and **b** in the presence of enzyme.
- D. Endothermic reaction with energy-**a** in the absence of enzyme and **b** in the presence of enzyme.

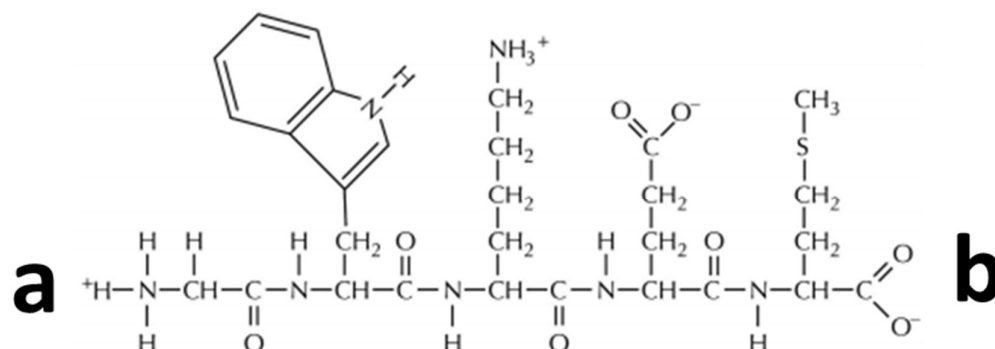
Q45. Observe the diagrams (a&b) and find out which type of transport each one represents.



Choose the correct function of both the type of transport based on the diagram given above.

- A. a= Active transport: Non-selective in nature and doesn't require energy, b = Passive transport: Selective in nature and requires energy
- B. a= Passive transport: Selective in nature and doesn't require energy, b = Active transport: Selective in nature and require energy
- C. a= Passive transport: Non-selective in nature and doesn't require energy, b = Active transport: Selective in nature and doesn't require energy
- D. a= Active transport: Selective in nature and requires energy, b = Passive transport: Selective in nature and doesn't require energy

- Q46. Observe the short peptide chain given below. Identify 'a' and 'b'. Calculate no of water molecule to be used to break this short peptide into amino acids.**

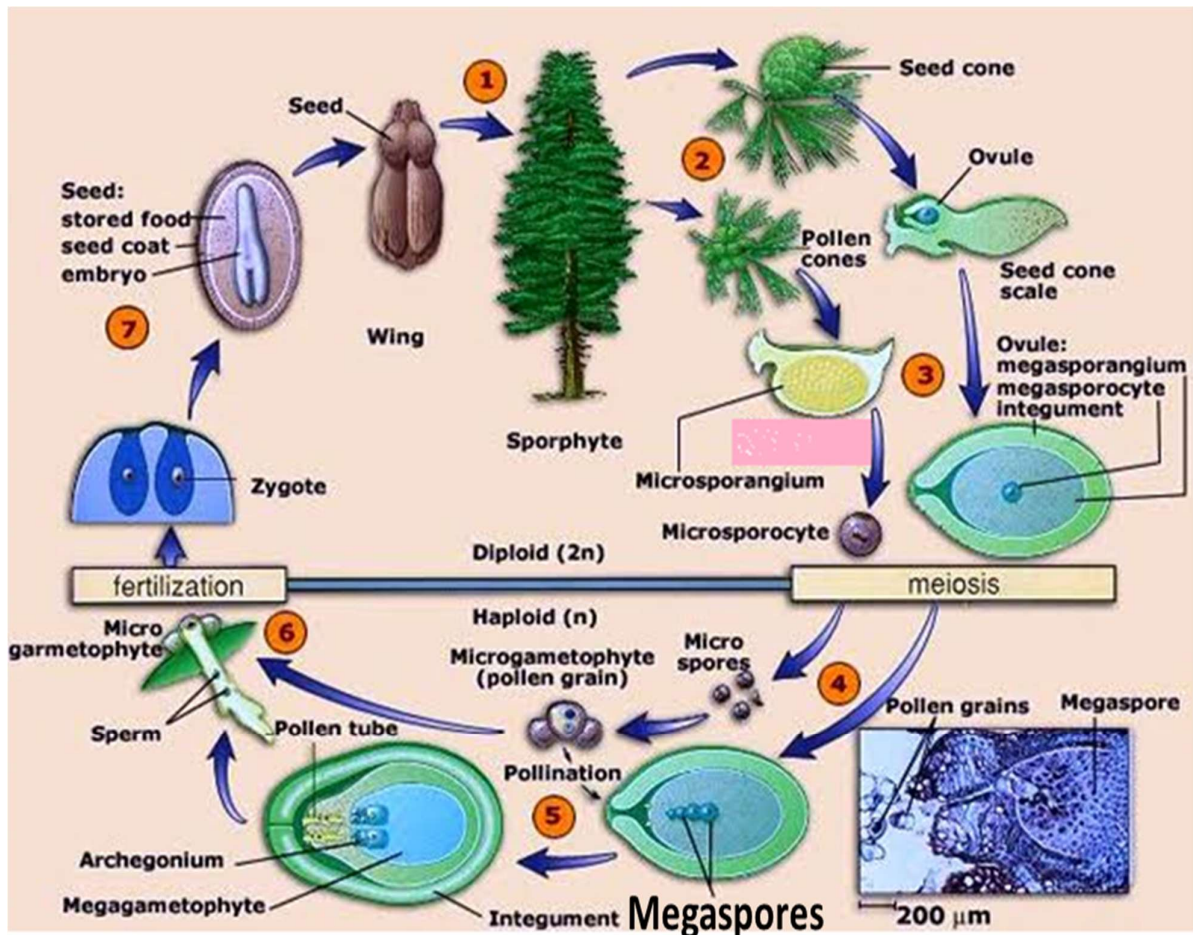


- A. a- N- terminus, b- C- terminus;4H₂O
 B. a- C- terminus, b- N- terminus;4H₂O
 C. a- N- terminus, b- C- terminus;6H₂O
 D. a- N- terminus, b- C- terminus;3H₂O
- Q47. Select the correct sequential arrangement of formation of cilia.**
- A. Centrosome-Basal body- Centriole- Cilia
 B. Centrosome- Centriole - Basal body - Cilia
 C. Basal body- Centriole - Basal body – Cilia
 D. Basal body - Centrosome - Centriole- Cilia
- Q48. Outer and inner membrane of chloroplast are:**
- A. structurally and functionally similar
 B. structurally and functionally dissimilar
 C. structurally different but functionally similar
 D. structurally similar but functionally different

SECTION -C

Section-C consists of **one case** followed by 6 questions linked to this case (Q.No.49 to 54). Besides this, 6 more questions are given. Attempt any 10 questions in this section. The first attempted 10 questions would be evaluated.

The gymnosperms are plants in which the seeds are not enclosed by any fruit wall. The gymnosperms are heterosporous producing microspores and megaspores within sporangia present on microsporophylls and megasporophylls respectively. Some plants like *Pinus* are monoecious and rest are dioecious like *Cycas*. Life cycle of gymnosperm is given below.



Read the passage and observe & analyze the diagram while answering the following questions from Q. No. 49 to 54.

Q49. Fruits are not found in gymnospermic plants because

- A. They are seedless plants.
- B. They are not pollinated.
- C. They have no ovary.
- D. Process of fertilization does not take place in them.

Q50. Which among the following are incorrect?

- A. Micro sporophylls bearing strobili are called micro sporangiate.
- B. Micro sporangiate strobiliare also called as male strobili because they contain microspores.
- C. Gametophytes can't exist independently in gymnosperms.
- D. Micro sporangiate and macro sporangiate strobili exist within the same plant in *Cycas*.

Q51. Calculate the number of chromosomes present in megaspore and embryo, if the number of chromosomes present in leaf of sporophyte belonging to Gymnosperm is 50.

- A. Megaspore-25; Embryo- 50
- B. Megaspore-50; Embryo- 25
- C. Megaspore-50; Embryo- 100
- D. Megaspore-100; Embryo- 50

Q52. Gymnospermic ovule contains more than one zygote (refer the above diagram). Point out the correct reason for this:

- A. More than one megasporocytes (megaspore mother cells) are present within ovule.
- B. Each ovule contains one megasporocyte and one archegonium.
- C. Each ovule contains more than one archegonia and each archegonium contains more than one eggs.
- D. Each ovule contains one archegonium that in turn contains one egg.

Q53. Find the correct sequence of arrangement of reproductive structures.

- A. Male cone- Megasporophyll- Megasporangium- Microspore
- B. Male cone- Megasporophyll- Microsporangium- Microspore
- C. Female cone- Megasporophyll- Megasporangium- Megaspore
- D. Female cone- Microsporophyll- Megasporangium- Microspore

Q54. Microsporocyte forms microspores and microspores undergo mitosis to produce male gametophytes. Find out the number of chromosomes present in microspore and male gametophytic cells, if the number of chromosomes present in microsporocyte is 90.

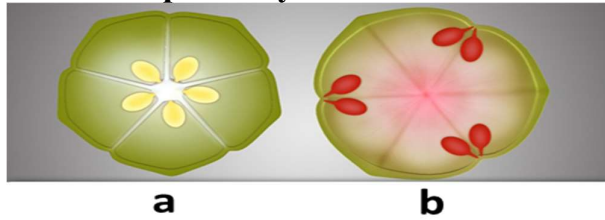
- A. Microspore- 45, Male gametophyte- 45
- B. Microspore- 90, Male gametophyte- 45
- C. Microspore- 45, Male gametophyte- 90
- D. Microspore- 90, Male gametophyte- 90

Q55. Read the following statements and select the correct option.

- (i) Blood cells produce the filaments of structural proteins called collagen and elastin.
- (ii) Neuroglial cells protect and support the nephrons.
- (iii) Osteocytes are present in spaces called lacunae.
- (iv) Skeletal muscle fibres are bundled together in a parallel fashion.
- (v) Biceps are involuntary and striated.

- A. Statements (iii) and (iv) are correct
- B. Statements (ii),(iii) and (iv) are correct
- C. Statements (ii) and (iv) are correct
- D. Statements (i) and (iii) are correct

Q56. Identify the types of placentation in the given diagrams (a & b) seen in tomato and mustard respectively.



Find out the correct statement for the above mentioned placentation.

- A. a- Axial- Septa absent, b- Parietal-Septa present
- B. a- Parietal - Septa absent, b- Axial –False septa
- C. a- Parietal - Septa present, b- Axial -Septa absent
- D. a- Axial- Septa present, b- Parietal-False septa

Q57. Read the given statements.

Gynoecium occupies the highest position while the other floral parts are situated below it.

Ovary is superior.

Examples are Brassica, Hibiscus, brinjal, etc.

Which condition of flowers is being described by the above statements?

- A. Hypogyny
- B. Perigyny
- C. Epigyny
- D. None of these

Q58. Find odd one out:

- A. Monocarpellary
- B. Apocarpous
- C. Monoadelphous
- D. Unilocular

Q59. Identify the correct pair.

Options	Proteins	Functions
A.	Collagen	Hormone
B.	Antibody	Fights against infectious agents
C.	Insulin	Intercellular ground substance
D.	Trypsin	Enables glucose transport in cell

Q60. Which is a secondary metabolite?

- A. Chlorophyll
- B. Amino acid
- C. Nucleoside
- D. Anthocyanin

*****ALL THE BEST*****