

DAY — 12

SEAT NUMBER

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2023	III	08	1100	J-285	(E)
BIOLOGY (56)					
Time : 3 Hrs.		(8 Pages)		Max. Marks : 70	

General Instructions :

The question paper is divided into **four** sections.

(1) **Section A :** Q. No. 1 contains **Ten multiple choice** type of questions carrying **one** mark each.

(i) For each multiple choice type of question, it is mandatory to write the correct answer along with its alphabet, e.g., (a) / (b) / (c) / (d) etc. No mark/s shall be given if **ONLY** the correct answer or alphabet of the correct answer is written.

(ii) In case of **MCQ**, evaluation will be done for the **first attempt** only.

Q. No. 2 Contains **Eight very short answer** type of questions carrying **one** mark each.

(2) **Section B :** Q. No. 3 to 14 are **short answer** type of questions carrying **two** marks each. (Attempt any **Eight**)

(3) **Section C :** Q. No. 15 to 26 are **short answer** type of questions carrying **three** marks each. (Attempt any **Eight**)

(4) **Section D :** Q. No. 27 to 31 are **long answer** type of questions carrying **four** marks each. (Attempt any **Three**)

(5) Begin the answer of each section on a new page.

SECTION – A

[10]

Q. 1. Select and write the correct answer for the following multiple choice type of questions :

- (i) Histones are rich in _____ .
(a) Lysine and Arginine
(b) Leucine and Methionine
(c) Serine and Leucine
(d) Phenyl alanine and Lysine
- (ii) How many mitotic divisions take place during the formation of a female gametophyte from a functional megaspore?
(a) One
(b) Two
(c) Three
(d) Four
- (iii) Which of the following is the only gaseous plant growth regulator?
(a) ABA
(b) Cytokinin
(c) Ethylene
(d) Gibberellin
- (iv) The pH of nutrient medium for plant tissue culture is in the range of _____ .
(a) 2 to 4.2
(b) 5 to 5.8
(c) 7 to 7.5
(d) 8 to 9.5
- (v) Rivet Popper Hypothesis is an analogy to explain the significance of _____ .
(a) Biodiversity
(b) natality
(c) sex-ratio
(d) age distribution ratio
- (vi) Which of the following group shows ZW-ZZ type of sex determination?
(a) Pigeon, Parrot, Sparrow
(b) Parrot, Bat, Fowl
(c) Bat, Fowl, Crow
(d) Sparrow, Fowl, Cat

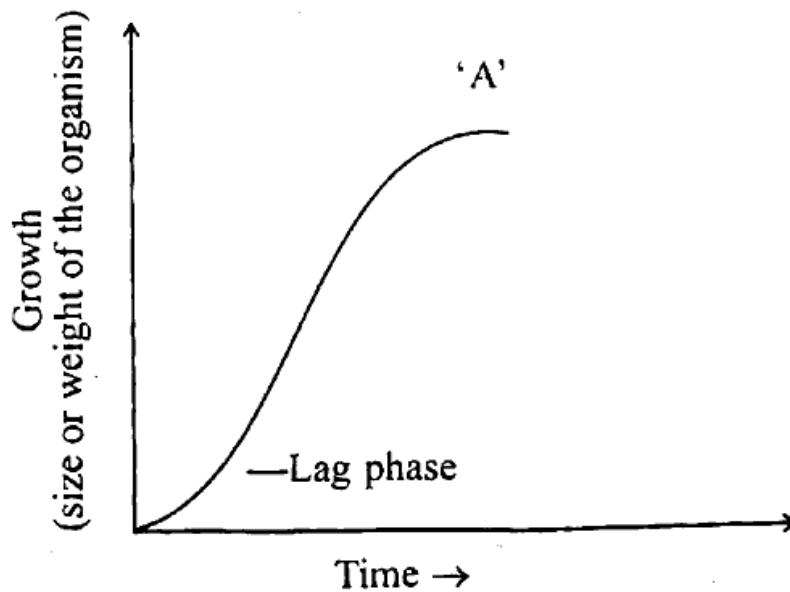
- (vii) In Hamburger's phenomenon, _____ .
- (a) Cl^- diffuse into WBCs
 - (b) Cl^- diffuse into RBCs
 - (c) Na^+ diffuse into RBCs
 - (d) Na^+ diffuse into WBCs
- (viii) Calcium and Phosphate ions are balanced between blood and other tissues by _____ .
- (a) Thymosin and Parathormone
 - (b) Calcitonin and Somatostatin
 - (c) Collip's hormone and Calcitonin
 - (d) Calcitonin and Thymosin
- (ix) Identify the INCORRECT statement.
- (a) In a flaccid cell, T.P. is zero
 - (b) In a turgid cell, DPD is zero
 - (c) In a fully turgid cell, TP = OP
 - (d) Water potential of pure water is negative
- (x) Which of the following is a hormone releasing contraceptive?
- (a) Cu-T
 - (b) Cu-7
 - (c) Multiload-375
 - (d) LNG-20

Q.2. Answer the following questions :

[8]

- (i) Which disease is caused by HPV?
- (ii) Which device is used to clean both dust and gases from polluted air?
- (iii) Mention the name of sterile animal produced by intergeneric hybridisation.
- (iv) Give the name of first transgenic plant.

- (v) A child has low BMR, delayed puberty and mental retardation. Identify the disease.
- (vi) Identify 'A' in the given graph of population growth :



- (vii) Complete the following box with reference to symptoms of mineral deficiency :

Abscission	Pre-mature fall of flowers, fruits and leaves
<input type="text"/>	Appearance of green and non-green patches on leaves

- (viii) Give an example of plant having both kidney and dumb-bell shaped guard cells in stomata.

SECTION – B

Attempt any EIGHT of the following questions :

[16]

Q. 3. Define the terms :

- (a) Gross Primary Productivity
 (b) Net Primary Productivity

- Q. 4. Draw a neat diagram of thyroid gland and label thyroid follicle, follicular cells and blood capillaries.
- Q. 5. (a) Give reason – ABA is also known as antitranspirant.
(b) Explain the role of chlorophyllase enzyme in banana.
- Q. 6. Complete the chart showing human proteins produced by rDNA technology to treat human diseases and re-write.

Disorders/diseases	Recombinant Proteins
	Erythropoietin
Asthma	
	Tissue plasminogen activator
Emphysema	

- Q. 7. (a) Define – Imbibition
(b) Explain how imbibition helps root hairs in adsorption of water.
- Q. 8. Draw a neat diagram of the conducting system of human heart and label AV node, Bundle of His and Purkinje fibres.
- Q. 9. Distinguish between heterochromatin and euchromatin with reference to staining property and activity.
- Q. 10. Complete the following chart regarding energy flow in an Ecosystem and re-write :

?	Herbivores
Primary Producer	?
?	Man, Lion
Secondary consumer	?

- Q. 11. (a) What is biofortification?
(b) Mention one example each of fortification with reference to –
(i) Amino acid content (ii) Vitamin-C content

Q. 12. Differentiate between X-chromosome and Y-chromosome with reference to —

- (a) length of non-homologous regions
- (b) type as per position of centromere.

Q. 13. Define the terms :

- (a) Genetic drift
- (b) Homologous organs

Q. 14. (a) What is *ex-situ* conservation?

- (b) Mention any two places where the *ex-situ* conservation is undertaken.

SECTION – C

Attempt any EIGHT of the following questions :

[24]

Q. 15. (a) Define – Incomplete dominance.

- (b) If a red flowered *Mirabilis jalapa* plant is crossed with a white flowered plant, what will be the phenotypic ratio in F₂ generation? Show it by a chart.

Q. 16. (a) Differentiate between sympathetic and parasympathetic nervous system with reference to the following :

- (i) Pre and post ganglionic nerve fibres.
- (ii) Effect on heart beat.

- (b) Give reason — All spinal nerves are of mixed type.

Q. 17. (a) Draw a suitable diagram of replication of eukaryotic DNA and label any three parts.

- (b) How many amino acids will be there in the polypeptide chain formed on the following mRNA?

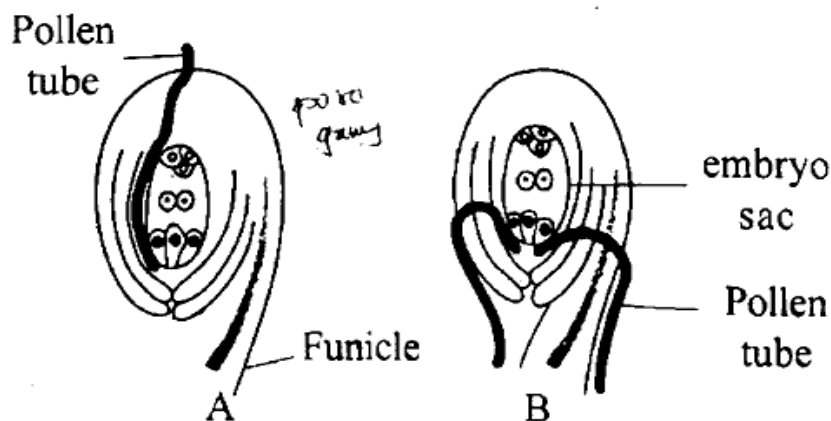
5'GCCACAUGGAGAUGACGACAAAAUUUUACUAGAAAA3'

Q. 18. Describe the steps in breathing.

- Q. 19. (a) What is spermatogenesis?
 (b) Draw a neat and labelled diagram of spermatogenesis.
- Q. 20. (a) What is a connecting link?
 (b) Which fossil animal is considered as the connecting link between reptiles and birds? Give any one character of each class found in it.
- Q. 21. Complete the following chart regarding population interaction and re-write :

Sr.No.	Name of interaction	Interaction between
1	—?—	<i>Plasmodium</i> and Man
2	—?—	Leopard and Lion
3	—?—	Clown fish and Sea-anemone

- Q. 22. (a) What is composition of bio-gas?
 (b) Mention any four benefits of bio-gas.
- Q. 23. (a) Give reason — Water acts as thermal buffer.
 (b) Draw a neat and proportionate diagram of root hair and label mitochondria, nucleus and vacuole.
- Q. 24. Explain three main functions of free antibodies produced by B-lymphocytes. <https://www.maharashtrastudy.com>
- Q. 25. (a) Following are the diagrams of entry of pollen tube into ovule. Identify the type A and B.



- (b) Give any four points of significance of double fertilization.
- Q. 26.** (a) Name the hormone which is responsible for apical dominance.
- (b) A farmer wants to remove broad-leaved weeds from the jowar plantation in his field. Suggest any plant hormone to remove such weeds.
- (c) Mention any two applications of cytokinin.

SECTION – D

Attempt any **THREE** of the following questions :

[12]

- Q. 27.** (a) What is blood pressure?
- (b) Give the name of the instrument which is used to measure the blood pressure.
- (c) Differentiate between an artery and a vein with reference to lumen and thickness of wall.
- Q. 28.** (a) Describe any three adaptations in anemophilous flowers. Mention any one example of the anemophilous flower.
- (b) Describe any three adaptations in hydrophilous flowers. Mention any one example of the hydrophilous flower.
- Q. 29.** (a) What is polymerase chain reaction (PCR)?
- (b) Describe three steps involved in mechanism of PCR.
- Q. 30.** (a) Give any four significances of fertilization in human.
- (b) Mention the names of any two organs each derived from ectoderm and mesoderm.
- Q. 31.** (a) Give any two functions of cerebellum.
- (b) Write the names of any four motor cranial nerves with their appropriate serial number.
- (c) Which hormones stimulate liver for glycogenesis and glucogenolysis?

