

Newton's Academy

BIOLOGY

Time: 3 Hrs.

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.
- (3) **Section C:** Q. No. 15 to 26 are **short answer** type of questions carrying **three** marks each.
- (4) **Section D:** Q. No. 27 to 31 are **long answer** type of questions carrying **four** marks each.
- (5) Begin the answer of each section on a new page.

SECTION – A

Q.1. Select and write the correct answer for the following multiple choice type of questions: [10]

- (i) In lac operon the structural gene z codes for _____ enzyme.

(a) β -galactosidase	(b) β -galactoside permease
(c) transacetylase	(d) RNA polymerase
- (ii) The special hygroscopic tissue found in the aerial roots of some epiphytic plants is _____.

(a) velamen	(b) epiblema
(c) endodermis	(d) xylem
- (iii) Due to specific mating behaviour, the members of population do not mate in _____ type of isolation.

(a) Ecological	(b) Seasonal
(c) Ethological	(d) Mechanical
- (iv) The sequence of nitrogenous bases on DNA molecule is ATCGA. Which of the following is the correct complementary sequence of nitrogenous bases on mRNA Molecule?

(a) TAGCT	(b) TAGCA
(c) UAGCU	(d) UACGU
- (v) The oral vaccine for prevention of typhoid recommended by WHO is _____.

(a) typhoid polysaccharide	(b) typhin V
(c) typherix	(d) Ty2la
- (vi) The large holes in Swiss cheese are developed due to the production of large amounts of _____.

(a) O ₂	(b) CO ₂
(c) N ₂	(d) H ₂
- (vii) Miyawaki is a method of plantation adapted by the government for the project mission Harit Kranti from the country.

(a) Japan	(b) Bhutan
(c) China	(d) America
- (viii) In ecological succession, the _____ community does not evolve further.

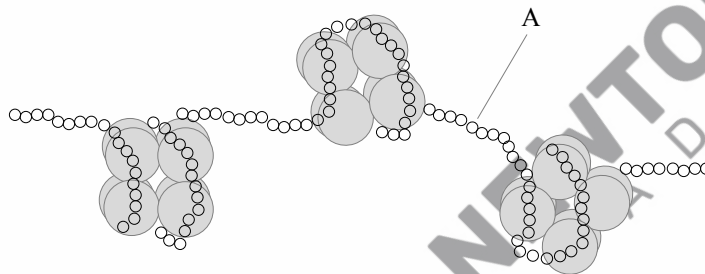
(a) seral	(b) pioneer
(c) intermediate	(d) climax

- (ix) Which of the following sets or organisms are used as cloning organisms in plant biotechnology?
- (a) *E.coli* and *Rhizobium* (b) *E.coli* and *Agrobacterium tumefaciens*
 (c) *Azobacterium* and *Rhizobium* (d) *E.coli* and *Azobacterium*
- (x) *Aspergillus niger* is the microbial source of _____.
- (a) Vitamin C (b) Vitamin B₂
 (c) Vitamin B₁₂ (d) Vitamin B₆

Q.2. Answer the following questions:

[8]

- (i) Write the name of the small molecule required to initiate / start the process of synthesis of new complementary strand during replication of DNA.
- (ii) Name the country where industrial melanism was observed in moths due to industrialization.
- (iii) Give the other name for epidermal cells in roots of plants.
- (iv) Name the hormone used for early rooting in propagation by cutting.
- (v) In human pharynx, there is a set of lymphoid organs called _____.
- (vi) State the other name for Dentist's nerve.
- (vii) Name the type of Mycorrhiza that grows in between and within the cortical cells of root.
- (viii) Identify the part labelled 'A' in the given diagram:

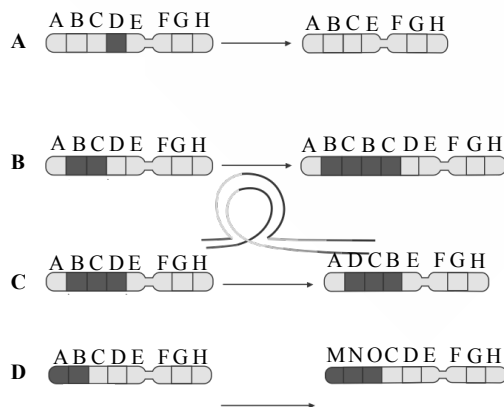


SECTION – B

Attempt any EIGHT of the following questions:

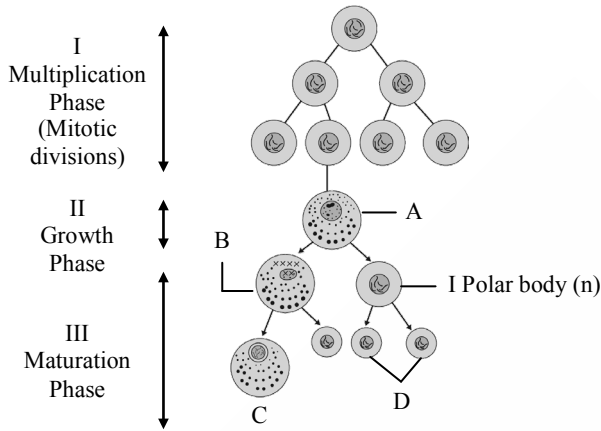
[16]

- Q.3.** Sketch and label the diagram of ovule most commonly seen in angiosperms.
- Q.4.** Explain "Law of dominance" with suitable example.
- Q.5.** A woman is unable to conceive due to blockage in her upper segment of oviduct. State the infertility treatment to be given to her and describe it.
- Q.6.** Identify the types of chromosomal aberrations in the following figures A, B, C, D:



- Q.7.** The process of transcription takes place on a part of DNA molecule known as transcription unit. Draw a well labelled diagram of the same showing different regions of the unit.

Q.8. Identify labels A, B, C, D:



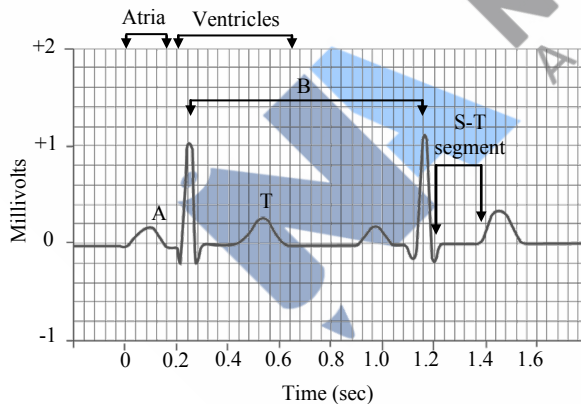
Q.9. Match the pairs and rewrite:

Column I		Column II	
(a)	Connecting link between ape and man	(1)	<i>Homo erectus</i>
(b)	Ape man	(2)	<i>Homo habilis</i>
(c)	Handy man like	(3)	Neanderthal man
(d)	Advanced prehistoric man	(4)	<i>Australopithecus</i>

Q.10. Define polyembryony. State its different types.

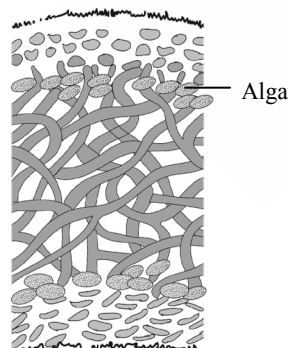
Q.11. Which are the major abiotic factors that influence habitat?

Q.12. Identify A and B in the given diagram and explain T wave.



Q.13. Water acts as a thermal buffer. Justify the statement.

Q.14. The following diagram indicates which type of interaction? Write a note on the same.



SECTION – C
Attempt any EIGHT of the following questions:
[24]

Q.15. Suresh is doing his studies on a plant related to absorption of water. He found different forms of water available in the soil.

- (i) Name them.
- (ii) Which form of water is absorbed by the plants?
- (iii) Name the region in the soil from where roots absorb water.

Q.16. Name the stress hormone in plants. Describe its physiological effects.

Q.17. (a) Sketch and label the diagram of brain to show ventricles in coronal plane.

(b) Name the cavity which is continuation of IV ventricle.

Q.18. Complete the following chart and rewrite:

Blood Group	Genotype	Antigen on the Surface of RBC	Antibody in serum
A	$I^A I^A$ or $I^A I^O$	–	–
–	$I^B I^B$ or $I^B I^O$	B	a
AB	–	A and B	(Nil)
–	$I^O I^O$	(Nil)	–

Q.19. Explain the various steps of biogas production.

Q.20. How ‘melt in mouth’ vaccines are administered? Mention any two benefits of the same.

Q.21. Enumerate or enlist the various levels of biodiversity. Explain any one of it.

Q.22. Write down various sequential stages of hydrarch succession in plants after phytoplankton stage.

Q.23. With the help of a suitable example, write the mechanism of hormone action through membrane receptors.

Q.24. Classify the given proteins produced by rDNA technology to treat various diseases in human and rewrite as shown in the table:

Disorders / Diseases / Health Conditions	Recombinant Protein (s)
Atherosclerosis Anaemia Parturition Blood clots Diabetes Haemophilia A Haemophilia B	Platelet derived growth factor
(Factor VIII, Insulin, Relaxin, Factor IX, Erythropoietin, Tissue plasminogen activator)	

Q.25. Write a note on transport of carbon dioxide by bicarbonate ions at tissue level.

Q.26. Anita observed apical dominance in her plant. Name and describe the plant hormone that will reverse the effect.

SECTION – D
Attempt any THREE of the following questions:
[12]

Q.27. (a) Kabban Park in Bengaluru is having dull flowers with strong fragrance, abundant nectar and edible pollen grains. Identify the type of pollination, the flowers are adapted for.

(b) The process of fruit formation without fertilization is termed as _____.

(c) Differentiate between albuminous and exalbuminous seeds.

Q.28. Give reasons :

(a) Though fertilization takes place in the ampulla of fallopian tube, implantation of embryo takes place after reaching the uterus only.

(b) Corpus luteum persists in the ovary after fertilization.

(c) Explain the role of oxytocin hormone and describe the dilation stage of parturition.

- Q.29.** Give the graphic representation of back cross and test cross. Differentiate between them.
- Q.30.** (a) Name the nerve fibres internally connecting the cerebral hemispheres.
(b) Name the sulci which divide each cerebral hemisphere into 4 lobes.
(c) Describe the various functional areas found in the different lobes of cerebral hemispheres.
- Q.31.** (a) Describe the structure of lymphocytes and mention its types.
(b) Name the disorder caused due to abnormal and uncontrolled increase in number of WBCs.
(c) State the functions of neutrophils.

