

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.
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.

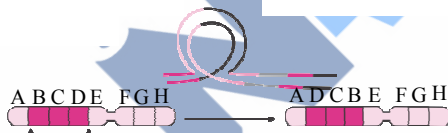
SECTION – A

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

- i. How many meiotic and mitotic divisions occur during the development of male gametophyte from the microspore mother cell?
 - (A) One meiotic and two mitotic
 - (B) Two meiotic only
 - (C) Two mitotic only
 - (D) One mitotic and one meiotic

- ii. During replication of DNA, the separated strands are prevented from recoiling by using _____.
 - (A) single strand binding protein
 - (B) reverse transcriptase
 - (C) endonuclease
 - (D) polymerase

iii.



Which event is represented by the above diagram, related to chromosomal aberrations?

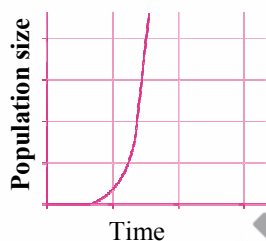
- (A) Deletion
 - (B) Duplication
 - (C) Inversion
 - (D) Translation
- iv. _____ hormone responsible for efflux of k^+ ions from guard cells and act as antitranspirant.
 - (A) Gibberellins
 - (B) Cytokinin
 - (C) Ethylene
 - (D) Abscissic acid
- v. Test tube baby technique is called _____.
 - (A) *In-vitro* fertilization
 - (B) *In-situ* fertilization
 - (C) *In-vivo* fertilization
 - (D) Artificial insemination
- vi. While playing cricket Raju faces problem of severe pain and heaviness in the chest. Pain spreads from neck, lower jaw, left arm and to left shoulder. From above symptoms identify disease
 - (A) Malaria
 - (B) Angina pectoris
 - (C) Kidney failure
 - (D) Typhoid
- vii. _____ layer is in close contact of CNS in human being.
 - (A) Cranium
 - (B) Dura matter
 - (C) Arachnoid matter
 - (D) Pia matter

- viii. Cellular factors in innate immunity is provided by _____.
- (A) phagocytes (B) antibody
(C) T - lymphocyte (D) B - lymphocyte
- ix. Pick out the appropriate association representing brood parasitism.
- (A) Hermit crab and sea anemone (B) Asian koel and common Indian crow
(C) Algae and fungi (D) Buffalo and cattle egret
- x. Annealing step of PCR, operates at _____ °C.
- (A) 90 – 98 (B) 40 – 60
(C) 70 – 75 (D) 100 – 120

Q.2. Answer the following questions:

[8]

- i. Name the part of gynoecium that determines the compatibility of pollen grains.
- ii. Which is the primary precursor of IAA in plants?
- iii. Name the cell which is responsible for nitrogen fixation in cyanobacteria.
- iv. How many Biodiversity hotspots have been identified around the world?
- v. Name the plant disease caused by *Agrobacterium tumefaciens*.
- vi. Identify the trophoblast cells which are in contact with embryonal knob during blastulation.
- vii. From the given diagram, identify the type of population growth curve:



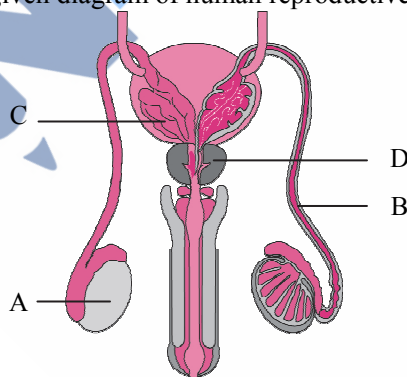
- viii. What do you mean by Pioneer species?

SECTION - B

Attempt any EIGHT of the following questions:

[16]

- Q.3.** Identify A, B, C, D, in the given diagram of human reproductive system:



- Q.4.** Identify chromosomal disorder caused due to non-disjunction of 21st number of chromosome and enlist its symptoms.
- Q.5.** Write the aims of human genome project.
- Q.6.** Match the parts of ovule given in column I with parts of seed given in column II:

	Column I		Column II
(a)	egg	(1)	testa
(b)	nucellus	(2)	tegmen
(c)	outer integument	(3)	perisperm
(d)	inner integument	(4)	embryo

- Q.7. Enlist the characteristics of Neanderthal Man.
- Q.8. Define the following:
 (a) Gravitational water (b) Hygroscopic water
 (c) Combined water (d) Capillary water
- Q.9. Give different properties of water.
- Q.10. A person met with a small accident and bleeds, but very soon stops bleeding. Explain the physiological process responsible for this.
- Q.11. Match the antibiotics in column I with their microbial sources in column II:

Column I		Column II	
(a)	Chloromycetin	(1)	<i>Streptomyces griseus</i>
(b)	Erythromycin	(2)	<i>Streptomyces aurifaciens</i>
(c)	Streptomycin	(3)	<i>Streptomyces Venezuelae</i>
(d)	Terramycin	(4)	<i>Streptomyces erythreus</i>

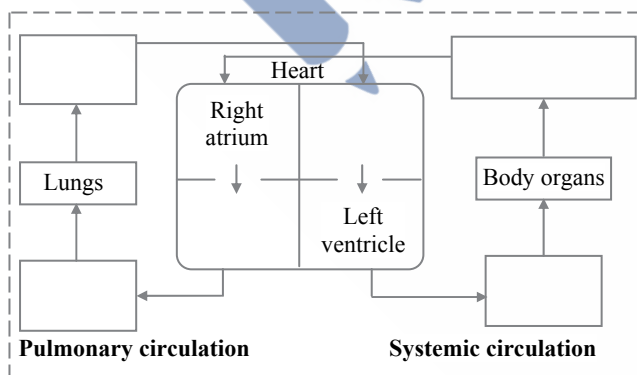
- Q.12. Abscissic acid is the common name given to two identical substances isolated separately. Name them. Give the chemical features of abscissic acid.
- Q.13. What are the effects of biotechnology with relation to human health?
- Q.14. Give the adaptations shown by desert animals.

SECTION – C

Attempt any EIGHT of the following questions:

[24]

- Q.15. Explain natural selection with example of industrial melanism.
- Q.16. Describe physiological effect and applications of gaseous hormone in plants.
- Q.17. What is ecological succession?
 Name various seral stages from pioneer species to climax community with suitable example in hydrarch succession.
- Q.18. With the help of a neat, labelled diagram describe the structure of root hair.
- Q.19. Complete the following flow diagram of double circulation:



- Q.20. Distinguish between hyperthyroidism and hypothyroidism.
- Q.21. Give the applications of DNA fingerprinting.
- Q.22. Write a note on *In-situ* and *Ex-situ* conservation.
- Q.23. Explain the properties of nerve fibres.
- Q.24. Give the causative agent, mode of transmission and symptoms of typhoid.

Q.25. Match the following products with their microbial sources:

Products		Microbial Sources	
(a)	Vitamin B ₂	(1)	<i>Rhizopus arrhizus</i>
(b)	Fumaric acid	(2)	<i>Candida lipolytica</i>
(c)	Vitamin B12	(3)	<i>Trichoderma Konigii</i>
(d)	Lipase	(4)	<i>Neurospora gossypii</i>
(e)	Cellulase	(5)	<i>Psuedomonas denitrificans</i>
(f)	Citric Acid	(6)	<i>Aspergillus niger</i>

Q.26. Explain any three examples of biopiracy.

SECTION – D

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

[12]

Q.27. With the help of neat and labelled diagrams, distinguish between artery and vein.

Q.28. State the names of hormone and glands secreting them:

- Growth of thyroid gland.
- Controls tubular absorption of water in kidney.
- Stimulates liver and muscles for glycogenesis.
- Development of immune system and maturation of T-lymphocyte.

Q.29. Describe outbreeding devices which encourages cross pollination.

Q.30. Explain the law of dominance and compare how it differs from incomplete dominance and co-dominance.

Q.31. Describe hormonal control in various phases of menstrual cycle.

