

DAY — **12**

SEAT NUMBER

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| 2026                | II | 25          | 1100 | <b>J-189</b>    | (E) |
| <b>BIOLOGY (56)</b> |    |             |      |                 |     |
| Time : 3 Hrs.       |    | ( 7 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. 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

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

- (i) A cell divides mitotically into two. Daughter cells divide and redivide repeatedly. Such growth is called \_\_\_\_.
- (a) arithmetic growth  
(b) geometric growth  
(c) growth ratio  
(d) qualitative growth
- (ii) The transgenic plant Tomato contains transgene \_\_\_\_ for the production of flavonoids.
- (a) Phytoene synthase (b) Ferritin  
(c) Chalcone isomerase (d) Phytase
- (iii) The cranial capacity of Neanderthal-man was \_\_\_\_ C.C.
- (a) 650 (b) 900  
(c) 1400 (d) 1450
- (iv) Identify the organism which meet their energy and nutrient requirements by degrading the detritus:
- (a) Omnivores (b) Carnivores  
(c) Autotrophs (d) Saprotrophs
- (v) Identify the algae among the following:
- (a) *Spirulina spp.* (b) *Aspergillus niger*  
(c) *Candida utilis* (d) *Trichoderma viridi*

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- (vi) In plants, soluble food is always translocated in the form of \_\_\_\_.
- (a) glucose (b) starch  
(c) sucrose (d) fructose
- (vii) Identify invasive plant species from the following :
- (a) *Gloriosa* (b) *Michelia*  
(c) *Sansvieria* (d) *Parthenium*
- (viii) The mature plasma cell produces antibodies at the rate of \_\_\_\_ molecules per second.
- (a) 2000 (b) 1000  
(c) 900 (d) 300
- (ix) Which is the largest WBC among the following?
- (a) Eosinophil (b) Monocyte  
(c) Basophil (d) Lymphocyte
- (x) The number of deaths when environmental pressures come into play is known as \_\_\_\_.
- (a) absolute mortality  
(b) absolute natality  
(c) realized mortality  
(d) realized natality

**Q. 2. Answer the following questions :**

**[8]**

- (i) Give the function of Leydig's cells.
- (ii) Define endangered species.
- (iii) Name the gene which is inherited directly from father to son.

- (iv) The producers receive 5000 Joules of light energy, then how much energy will be transferred to the carnivores (secondary consumers)?
- (v) Define the term chlorosis.
- (vi) Give the name of key factor in DNA profiling.
- (vii) Define combined water.
- (viii) Give the role of tapetum.

## SECTION – B

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

**[16]**

- Q. 3.** Give the features of respiratory surface for gaseous exchange.
- Q. 4.** Differentiate between complete sex-linkage and incomplete sex-linkage with reference to location of the gene and inheritance.
- Q. 5.** Explain the properties of nerve fibre with reference to :
  - (a) Irritability
  - (b) Conductivity
- Q. 6.** Draw a neat diagram of a nucleosome and label the following:
  - (i)  $H_1$  histone
  - (ii) DNA
  - (iii) Octamer
- Q. 7.** Give any four advantages of micropropagation.
- Q. 8.** Name the organisms and their role in conversion of rock into soil.
- Q. 9.** Explain various harmful effects of noise pollution on human being.

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- Q. 10. Explain skeletal features of *Homo erectus*.
- Q. 11. Enlist the main objectives for improved animal breeding programmes using gene transfer technology.
- Q. 12. Mention any four factors affecting water absorption.
- Q. 13. Write briefly on Alzheimer's disease.
- Q. 14. Calculate the amount of ATP required by nitrogen fixer for the formation of 1000 molecules of ammonia. Name the specialised cell of cyanobacteria where nitrogen is fixed.

## SECTION – C

Attempt any EIGHT of the following questions :

[24]

- Q. 15. Match the respiratory surface to the organism in which it is found :

| Organisms            | Respiratory surface / organs |
|----------------------|------------------------------|
| (1) Limulus          | (a) Lungs                    |
| (2) Protists         | (b) Internal gills           |
| (3) Tadpoles of frog | (c) Book lungs               |
| (4) Fishes           | (d) External gills           |
| (5) Reptiles         | (e) Plasma membrane          |
| (6) Spiders          | (f) Book gills               |
|                      | (g) Cloaca                   |

- Q. 16. Explain criss-cross inheritance with reference to bleeder's disease by suitable charts.
- Q. 17. (a) Distinguish between hibernation and aestivation.  
(b) Give two behavioural adaptations of desert animals.

- Q. 18.** Define :
- (a) Siphonogamy
  - (b) Parthenocarpy
  - (c) Polyembryony
- Q. 19.** What is transpiration? Explain stomatal opening and closing mechanism with reference to starch-sugar interconversion theory.
- Q. 20.** Enlist any six characteristics of genetic code.
- Q. 21.** (a) Mention the name of germ layer from which adrenal cortex and pancreas are developed.
- (b) Explain the role of alpha ( $\alpha$ ) and delta ( $\delta$ ) cells of islets of Langerhans.
- Q. 22.** Define addiction. Give the physiological effects of :
- (a) Cocaine
  - (b) Cannabinoids
- Q. 23.** What is infertility? Describe in brief ZIFT and GIFT.
- Q. 24.** Draw Urey and Miller's experimental setup and label it.
- Q. 25.** (a) What is grand period of growth?
- (b) Give two examples each of :
- (1) Growth promoters
  - (2) Growth inhibitors
- Q. 26.** (a) What is biofertilizer?
- (b) Draw and label the T.S. of root nodules.

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## SECTION – D

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

[12]

- Q. 27.** With the help of labelled diagram describe the structure of human sperm.
- Q. 28.** What is cardiac cycle? Draw a normal ECG and label it. What do P-wave and QRS complex represent?
- Q. 29.** Write the name of disorders caused due to hypo and hyper secretion of adrenal corticoids. Mention any 3 symptoms of each of these disorders.
- Q. 30.** Explain nuclear and helobial type of endosperm with suitable examples.
- Q. 31.** Describe in brief :
- (a) What is germ line gene therapy? Why is it not encouraged?
  - (b) Explain somatic cell gene therapy. Mention any two acquired disorders for which it is used.



