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) Chalone 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*

(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.

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 (α) and delta (δ) 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.

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.

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