

BIOLOGY Prelims I

MAHENDRA TUTORIALS

Time : 3 Hrs.

(4 Pages)

Max. Marks : 70

Note :

- (i) All questions are compulsory. .
 - (ii) Neat and labelled diagrams must be drawn wherever necessary
 - (iii) Figures to the right indicate full marks.
 - (iv) Answer to every question must be written on a new page.
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SECTION – I

Q.1. Select and write the most appropriate answer from the given alternatives for each sub-question : **[7]**

- (i) Which of the following is responsible expression of a trait?
 - (a) Recon (b) Muton
 - (c) Cistron (d) Codon
- (ii) An improved insect resistant variety “Pusa Gaurav” is variety of
 - (a) Brassica (b) Flat bean
 - (c) Cowpea (d) Bhindi
- (iii) The vertical distribution of trees is studied in
 - (a) Scarification (b) Stratification
 - (c) Zonation (d) Speciation
- (iv) A cross between an individual with unknown genotype for a trait with recessive plant for that trait is
 - (a) Backcross (b) Reciprocal cross
 - (c) Test cross (d) Monohybrid cross
- (v) PS-I gets the de-energized electrons from
 - (a) Water (b) Plastoquinone
 - (c) Plastocyanin (d) Cytochrome-f
- (vi) The cross pollination within the same species is also called
 - (a) Hybridization (b) Xenogamy
 - (c) Allogamy (d) Autogamy
- (vii) Which one of the following is a free living bacterial biofertilizer
 - (a) Azotobater (b) Rhizobium
 - (c) Nostoc (d) Bacillus thuringiensis

Q.2.(A) Answer in one sentence only :

[6]

- (i) What is polyblend?

- (ii) Define triple fusion.
- (iii) Where does dehydration occur in glycolysis?
- (iv) What are cytochromes?
- (v) What is the microbial source of vitamin C?
- (vi) Define bio-piracy.

(B) Give the diagrammatic representation of the structure of the Lac operon [2]

(C) Answer the following any TWO : [4]

- (i) Explain why law of segregation is also called law of purity of gametes
- (ii) Name any two antibiotics and their microbial source
- (iii) Write a note on cDNA library
- (iv) Write a note on somatic hybridization

Q.3.(A) Answer the following any TWO : [6]

- (i) Describe the steps involved in tissue culture technique
- (ii) Illustrate the mechanism of electron transport system
- (iii) Write a note on pleiotropy

(B) Give the diagrammatic representation of DNA replication [3]

Q.4. Answer the following any ONE : [7]

- (i) Write a note on Kranz anatomy. Describe C₄ pathway with examples?
- (ii) Describe the T.S. of Anther. Describe the development of male gametophyte in Angiosperms.

SECTION – II

Q.5. Select and write the most appropriate answer from the given alternatives for each sub-question : [7]

- (i) The cranial capacity of cro-magnon man was about _____
(a) 800 C.C (b) 1600 C.C
(c) 900 C.C (d) 1450 C.C
- (ii) The Human Genome project was initiated by U.S. Department of _____
(a) Agriculture (b) Energy
(c) Science (d) Technology
- (iii) Key factor in DNA profiling is _____
(a) sequence of nucleotides (b) DNA isolation
(c) VNTR (d) RFLP
- (iv) How many sperms will be formed from 200 spermatids
(a) 100 (b) 200
(c) 150 (d) 400
- (v) Infectious stage of plasmodium is _____
(a) Trophozoite (b) Sporozoite
(c) Cryptozoite (d) Metacercaria
- (vi) In a normal healthy person, normal blood glucose level is :
(a) 45 to 95 mg per 100 ml of blood
(b) 5 to 10 mg per 100 ml of blood
(c) 500 to 600 mg per 100 ml of blood
(d) 200 to 300 mg per 100 ml of blood
- (vii) Growth rate =
(a) $(\text{Mortality} - \text{Nativity}) / \text{Unit Time}$
(b) $(\text{Nativity} - \text{Mortality}) / \text{Unit Time}$
(c) $(\text{Mortality} + \text{Nativity}) / \text{Unit Time}$
(d) $(\text{Nativity} + \text{Mortality}) / \text{Unit Time}$

Q.6.(A) Answer in one sentence only : [6]

- (i) Define MOET.
(ii) What criss-cross inheritance ?
(iii) What is normal ECG ?
(iv) What are Chromomeres ?
(v) Give a reason for occurrence of abortion.
(vi) Name one haemolytic disease of new born.

(B) Sketch and label structure of sperm. [2]

(C) Answer the following any TWO : [4]

- (i) Explain in short double circulation.
(ii) Write a note on "Genetic drift".

- (iii) What is gene therapy and give its application.
- (iv) Explain 'commensalism' as an interaction with example.

Q.7.(A) Answer the following any TWO :

[6]

- (i) What is red data book? Give IUCN classification of organisms.
- (ii) Explain inheritance of colour blindness with the help of suitable chart.
- (iii) Write a note on kidney stones and its types with the help of diagram.

(B) Sketch and label structure of human eye.

[3]

Q.8. Answer the following any ONE :

[7]

- (i) Describe T.S. of thyroid gland and Write a note on function of thyroid gland and describe control mechanism of T₃ and T₄.
- (ii) Explain in detail the process of fertilization in human beings and add a note on its significance.

ALL THE BEST