BIOLOGY

PAPER - 1

(THEORY)

(Botany and Zoology)

(Three hours)

(Candidates are allowed additional 15 minutes for ***only*** *reading the paper.*

They must NOT start writing during this time.)

Answer **all** *questions in Part I and* **six** *questions in Part II, choosing* **two** *questions from each of the three sections A, B and C.*

All working including rough work, should be done on the same sheet as,

and adjacent to, the rest of the answer.

The intended marks for questions or parts of questions are given in brackets [ ].

PART I (20 Marks)

Answer **all** *questions.*

Question 1

(a) Give a brief answer for each of the following: **[4]**

(i) What is *heterosis?*

(ii) Why is non-cyclic photo phosphorylation considered as a non-cyclic pathway?

(iii) Define *test cross.*

(iv) What are *introns*?

(b) Each of the following question(s)/statement(s) has four suggested answers. Choose the correct option in each case. **[4]**

1. Triple Fusion involves:

(i) Fusion of one male gamete with female gamete

(ii) Fusion of tube nucleus with generative nucleus

(iii) Fusion of two polar nuclei

(iv) Fusion of second male gamete with two polar nuclei

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2. An EEG represents spontaneous electrical activity of the:

(i) Kidney
(ii) Spinal cord
(iii) Heart
(iv) Brain

3. The genotype of a person with Turner's syndrome will be:

(i) 44+XXY
(ii) 44+XYY
(iii) 44+XO
(iv) 44+XXYY

4. Transcription is the transfer of genetic code from a DNA molecule to:

(i) RNA molecule
(ii) Second DNA molecule
(iii) Ribosomal sub unit
(iv) Sequence of amino acids in a protein molecule

(c) Give a scientific term for each of the following: **[4]**

(i) The first formed category of photosynthetic organisms.
(ii) The surgical removal of a section of fallopian tube.
(iii) An animal behaviour which benefits others but is of no advantage to itself.
(iv) The hydrostatic pressure developed inside the cell on the cell wall due to endosmosis.

(d) Expand the following abbreviations: **[4]**

(i) STD
(ii) NADP
(iii) MRI
(iv) DDT

(e) Name the scientists who are associated with the following: **[4]**

(i) Discovered the fossil of Australopithecus
(ii) Microspheres
(iii) Coined the term *Diffusion Pressure Deficit*
(iv) Invented the CT scan

PART II (50 Marks)

SECTION A

*Answer any **two** questions.*

Question 2

(a) Give *any three* characters that have developed during human evolution. **[3]**

(b) Explain the term *chemogeny*. **[1]**

(c) Give *any two* distinctive features of *Dryopithecus*. **[1]**

Question 3

(a) Explain the evolution of giraffe's neck according to Lamarck's theory of evolution. **[3]**

(b) Give two chromosomal similarities between man and apes. **[1]**

(c) Name *any two* temporary embryonic structures in vertebrates which provide evidence for evolution. **[1]**

Question 4

(a) *Persons suffering from sickle cell anaemia are at an advantage in Malaria infested areas*. Explain. **[3]**

(b) Define the term *gene flow*. **[1]**

(c) What are analogous organs? Describe with one example from the plant kingdom. **[1]**

SECTION B

*Answer any **two** questions.*

Question 5

(a) With the help of diagrams, name and describe the different types of placentation seen in angiosperms. **[4]**

(b) Give *four* points of anatomical differences between a monocot stem and a dicot stem. **[4]**

(c) Define the following terms: **[2]**

(i) Racemose inflorescence

(ii) Osmotic pressure

Question 6

(a) Draw a diagram of the internal structure of the human ovary. **[4]**

(b) Define the term *water potential.* What are its components? Explain. **[4]**

(c) Give definition and importance of: **[2]**

(i) Imbibition
(ii) Parturition

Question 7

(a) Give *four* adaptations in flowers pollinated by insects. **[4]**

(b) Describe the mass flow hypothesis for translocation of organic solutes (food) in plants. **[4]**

(c) Write a brief note on the causes of infertility. **[2]**

SECTION C

*Answer any **two** questions.*

Question 8

(a) Give *any four* reasons for Mendel's success. **[4]**

(b) Briefly describe the technique employed in DNA fingerprinting. **[4]**

(c) Give *any two* features of *Genetic Code*. **[2]**

Question 9

(a) Explain the mechanism of action of T cells to antigens. **[4]**

(b) Explain how insulin can be produced using recombinant DNA technology. **[4]**

(c) What is pisiculture? Give *one* advantage. **[2]**

Question 10

(a) Name the causative organism and preventive measures for each of the following: **[4]**

(i) Swine flu

(ii) Typhoid

(iii) Filariasis

(iv) Syphilis

(b) State *four* causes and *four* consequences of population growth. **[4]**

(c) Differentiate between: **[2]**

(i) Cannabinoids and Barbiturates

(ii) Biotic potential and Carrying capacity