BIOLOGY

PAPER – 1

(THEORY)

(Maximum Marks: 70)

(Time allowed: Three hours)

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

They must NOT start writing during this time.)

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*This paper comprises **TWO PARTS** – Part I and Part II.*
*Answer **all** questions.*

*Part I consists of **one** question of 20 marks having five subparts.*

Part II consists of Sections A, B and C.

*Section A consists of **seven** questions of **two** marks each.*

*Section B consists of **seven** questions of **three** marks each, and*

*Section C consists of **three** questions of **five** marks each.*

Internal choices have been provided in two questions in Section A, two questions in Section B and in all three questions of Section C.

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

PART I (20 Marks)

*Answer **all** questions.*

Question 1

(a) Answer the following questions briefly and to the point: **[8×1]**

(i) Name the antibody which is most effective in allergies.

(ii) What is the function of GEAC ?

(iii) What is a *clone?*

(iv) What do detritus food chains begin with?

(v) Give the full form of EFB.

(vi) How many chromosomes are present in meiocytes of a fruit fly?

(vii) Name the common ancestor of apes and man.

(viii) Give the scientific term used for the preservation of germplasm at a very low temperature.

(b) Each of the following sub-parts, (i) to (iv) has four choices. Choose the best option in each case: **[4×1**

(i) Eyelids in human foetus separate in:

(1) 14 weeks

(2) 16 weeks

(3) 24 weeks

(4) 40 weeks

(ii) Study the given monohybrid cross:

P_1 TT × tt

F_1 Tt

A test cross for this F_1 will be:

(1) Tt × TT

(2) Tt × tt

(3) Tt × Tt

(4) TT × tt

(iii) Montreal Protocol aims at:

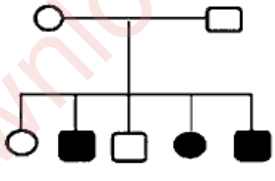
(1) Reduction of ozone depleting substances

(2) Biodiversity conservation

(3) Control of water pollution

(4) Control of CO_2 emission.

(iv) In the given pedigree chart, the trait shown is:



(1) Autosomal dominant

(2) Autosomal recessive

(3) X-linked

(4) Y-linked

(c) Give *one* significant contribution of each of the following scientists: **[4×1]**

(i) Wallace

(ii) R. Mishra

(iii) G. Gamow

(iv) Sanger

(d) Define the following: **[2×1]**

(i) Carrying capacity

(ii) Homologous chromosomes

(e) Give a reason for each of the following: **[2×1]**

(i) Bagging is essential in artificial hybridisation.

(ii) Climax stage is achieved quickly in secondary succession as compared to primary succession.

PART II

SECTION A (14 Marks)

*(Answer **all** questions)*

Question 2 **[2]**

Enumerate *any four* essential features of good and effective poultry farm management practices.

Question 3 **[2]**

What is a *single cell protein?* How is it significant for human welfare?

Question 4 **[2]**

(a) List *four* reasons for drug addiction.

OR

(b) List *four* effects of alcoholism on human health.

Question 5 **[2]**

State *four* features of flowers pollinated by insects.

Question 6 **[2]**

What is *reproductive fitness?* Explain it with the help of an example.

Question 7 **[2]**

Give *one* significant difference between *primary lymphoid organs* and *secondary lymphoid organs*. Give *one* example of each.

Question 8 **[2]**

(a) Explain the term *biofortification*. How is this technique useful for the production of *golden rice?*

OR

(b) Write a short note on *Electrophoresis*.

SECTION B (21 Marks)

*(Answer **all** questions)*

Question 9 **[3]**

Explain the evolution of long neck of giraffe according to Charles Darwin.

Question 10 **[3]**

(a) Draw a labelled diagram of the T.S. of a mature anther.

OR

(b) Draw a labelled diagram of the internal structure of human ovary.

Question 11 **[3]**

Describe the structure of a nucleosome with the help of a well-labelled diagram.

Question 12 **[3]**

(a) Explain the *Rivet Popper* hypothesis.

OR

(b) Define:

(1) Standing crop

(2) Stenothermal organisms

(3) Niche

Question 13 **[3]**

Give the biological names of the following:

(i) The mould from which penicillin is obtained.

(ii) Baker's yeast.

(iii) The microbe used to control insect larvae growing on cotton.

(iv) The microbe used to produce Swiss cheese.

(v) The fungus that is being developed as a bio-control agent.

(vi) A symbiotic nitrogen fixing bacterium found in root nodules.

Question 14 **[3]**

Explain the different types of endosperms in angiosperms.

Question 15 **[3]**

A homozygous pea plant with round seed coat and yellow cotyledons is crossed with another homozygous pea plant having wrinkled seed coat and green cotyledons.

(i) Give the types of gametes produced by plants of F_1-generation.

(ii) Give the dihybrid phenotypic ratio with the corresponding phenotypes.

(iii) State the Mendel's principle involved in this cross.

SECTION C (15 Marks)

*(Answer **all** questions)*

Question 16 **[5]**

(a) Describe the physico-chemical events that take place during fertilization in humans.

OR

(b) (i) Define and give the role of amniocentesis.

(ii) Name the causative agent and give *any one* symptom of Gonorrhoea.

(iii) What is the significance of dispersal of seeds? Give any two points.

(iv) What are seasonal breeders? Give an example.

(v) How is the chromosome number maintained in sexually reproducing organisms?

Question 17 **[5]**

(a) (i) What are *restriction endonucleases?* Give the rules of their nomenclature.

(ii) Explain the mechanism of action of restriction endonucleases that makes them suitable for genetic engineering.

OR

(b) (i) Explain what are the desirable characteristics of an ideal cloning vector used in rDNA technology.

(ii) Describe *two* vectorless methods of gene transfer used in rDNA technology.

Question 18 **[5]**

(a) Give a graphic representation of carbon cycle in nature.

OR

(b) Give a graphic representation of phosphorus cycle in nature.