BIOLOGY

Paper – 1

(THEORY)

(Botany and Zoology)

Three hours and a quarter

(The first 15 minutes of the examination are for reading the paper only.

Candidates must NOT start writing during this time).

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*Answer **all** questions in Part I and **five** questions from Part II, choosing **three** questions from Section A and **two** questions from Section B.*

All workings, including rough work, should be done on the same sheet as, and adjacent to; the rest of the answer.

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

PART I (40 marks)

*Answer **all** questions.*

Question 1.

(a) Read the following questions carefully. For each question there are four alternatives A, B, C and D. Choose the correct alternative and write it in your answer sheet. **[4]**

(i) Green plants evolve carbon-dioxide on a hot sunny day because

A photophosphorylation takes place.

B photorespiration takes place.

C decarboxylation occurs.

D carboxylation occurs.

(ii) The number of light quanta required for evolution of 1 molecule of oxygen is called

A photosynthetic yield.

B quantum yield.

C organic yield.

D oxygen yield.

(iii) Maximum solar energy is trapped by
A planting trees.

B growing grasses.

C cultivating crops.

D growing algae in tanks.

(iv) When a potato tuber is exposed to light, it develops
A anthocyanin.

B chloroplast.

C leucoplast.

D carotene.

(v) In ABO system of blood grouping, transfusion is *not* possible from
A A to O.

B A to AB.

C B to AB.

D O to AB.

(vi) Blood capillaries are made of
A endothelium only.

B endothelium and muscle fibres.

C endothelium and connective tissue.

D endothelium, connective tissues and muscle fibres.

(vii) Agranulocytes are
A eosinophils and basophils.

B basophils and thrombocytes.

C lymphocytes and monocytes.

D lymphocytes and eosinophils.

(viii) Mammalian red blood corpuscles have short life span due to absence of
A endoplasmic reticulum.
B mitochondria.
C ribosomes.
D nucleus.

(b) Mention one significant difference between each of the following based on what is given in brackets. **[5]**

(i) pectoral girdle and pelvic girdle (function)
(ii) forward mutation and reverse mutation (organism type)
(iii) spontaneous mutation and induced mutation (origin)
(iv) monosomic mutation and polysomic mutation (changes in number of chromosomes)
(v) man and ape (blood groups)

(c) Correct the following statements by changing the underlined word. **[5]**

(i) The development of diploid embryo sac from diploid megaspore mother cell is called <u>apospory</u>.
(ii) The entry of pollen tube through the micropyle into the embryo sac is called <u>chalazogamy</u>.
(iii) <u>Micelles</u> are the fatty acids and glycerides that form fat droplets in the lymph.
(iv) Vitamin D deficiency in children causes <u>osteomalacia</u>.
(v) Pesticides used to kill rodents are called <u>nematicides</u>.

(d) Give the scientific term for the following: **[5]**

(i) Origin of life
(ii) Origin of living forms only from pre-existing living forms
(iii) Investigation of the presence of life on other heavenly bodies
(iv) Development of complex forms of life from simpler ones by gradual change
(v) Break down of nitrogenous organic compounds in the absence of air

(vi) Proteins released in minute quantities by animals or human cells on being infected by virus

(vii) Antibodies made outside the body by hybrid cell cultures

(viii) Antibodies that neutralize toxins entering the body from the outside

(ix) Treatment which involves the use of tranquilizers to slow down the brain activity in very disturbed patients

(x) Loss of memory due to excessive alcohol intake

(e) Match each item under Column A with that which is most appropriate in Column B. You must rewrite the correct matching pairs. **[5]**

Column A	**Column B**
(i) ACTH	a. corpus luteum
(ii) Acromegaly	b. heterocrine glands
(iii) Progesterone	c. chloromycetin
(iv) Isotropic band	d. vitamin A deficiency
(v) Ball and socket joints	e. anterior pituitary
(vi) Typhoid	f. hypersecretion of growth hormone
(vii) Xeropthalmia	g. hardening of arteries
(viii) Arthritis	h. inflamed and swollen joints
(ix) Pancreas and gonads	g. enartherosis
(x) Arteriosclerosis	i. myosin filament
	j. actin filament

(f) Answer the following:

(i) What would happen to an aquatic plant if the aerenchyma cells fail to develop? **[1]**

(ii) Why do xylem vessels get blocked in woody plants? **[1]**

(iii) Why do xerophytes have a well developed and extensive root system? **[1]**

(iv) State *four* symptoms of phosphorus deficiency in plants. **[2]**

(g) Define the following. **[5]**

(i) Differentiation

(ii) Rouleaux formation

(iii) Parturition

(iv) Hybridization

(v) Gene bank

(h) Write the most significant function of the following: **[6]**

(i) Artificial selection

(ii) Physiological isolation

(iii) Hydathodes

(iv) The process of imbibition for germination of a seed

(v) Premotor area in the frontal lobe of cerebrum

(vi) Acetycholine

PART II

SECTION A (30 marks)

Answer any* three *questions.

Question 2.

(a) (i) What is permanent tissue? **[1]**

(ii) Explain the general characteristics of the three types of simple permanent plant tissues with the help of the L.S diagram of each type. **[3]**

(b) Mention *six* significance of turgidity in plants. **[3]**

(c) Draw the L.S of an ovary to show the process of fertilization in angiosperms. **[3]**

Question 3.

(a) (i) Study the table given below. Copy the question number and write the answer. **[2]**

No.	Element	Deficiency Symtoms
(i)	……	Weak stalks, stunted growth, mottled chlorosis
(ii)	……	Interveinal chlorosis followed by necrosis

(iii)	……	Chlorosis in young leaves, no chloroplast formatio
(iv)	……	Accumulation of starch, sucrose and soluble nitrogen, change in pigmentation

(ii) What artificial methods are applied to improve soil fertility? List and explain briefly. **[2]**

(b) Outline any *two* differences between photoperodism and vernalization. **[2]**

(c) Give suitable reasons for the following: **[4]**

(i) Breathing through the nose is healthier than breathing through the mouth.

(ii) Gaseous exchange continues in the lungs even after maximum forceful expiration.

(iii) Blood of insects lack respiratory pigment.

(iv) Aerobic respiration generates much more energy than anaerobic respiration.

Question 4.

(a) What are fast muscle fibres? **[2]**

(b) Draw a neat labeled diagram of the vertical section of a mammalian heart. **[4]**

(c) When a potted plant is kept horizontally, its roots show downward curvature and the stem shows upward curvature. Give reasons for this phenomenon. **[3]**

(d) Defoliated plants do not flower even when exposed to appropriate amounts of light. Justify the statement. **[1]**

Question 5.

(a) With the help of a labeled diagram, explain the process of ultra filtration in the glomerus. **[4]**

(b) Why do plants fail to grow in highly saline soil? **[2]**

(c) Discuss the transmission of an impulse through a synapse. **[4]**

Question 6.

(a) Describe the process of digestion of carbohydrates in human beings.

(b) Draw a labeled diagram of a mammalian spermatozoa as seen under a light microscope. **[2]**

(c) Distinguish between compact bone and cancellate bone based on the following: **[2]**

(i) position

(ii) bony substance

(iii) lamellae

(iv) marrow cavity

(d) Explain briefly the role played by thromboplastin, thrombin and fibrin in blood coagulation. **[3]**

SECTION B (30 marks)

Answer any two questions.

Question 7.

(a) Fossils reveal the course of evolution of plants and animals. In the light of this statement answer the following: **[4]**

(i) Distribution of fossil in the rocks

(ii) Missing link

(iii) Evolutionary history of individual form and

(iv) Land patterns

(b) Write *four* applications of callus culture. **[2]**

(c) Why do pulses contain more proteins than cereals? **[2]**

(d) (i) What is sickle cell anemia? **[1]**

(ii) Explain how natural selection has favoured the Negroes with sickle-cell anemia. **[4]**

(e) How will the use of organic waste minimize the use of fire wood in the villages? **[2]**

Question 8.

(a) What do you understand by the terms inbreeding and out breeding?

(b) Explain any *three* objections of Lamarck's theory of evolution.

(c) What role does mutation play in evolution? **[2]**

(d) How has the knowledge of Biology helped in improving human health? **[2]**

(e) Excessive use of pesticides could lead to extinction of useful organisms. Justify the statement. **[2]**

(f) List *one* application of the following: **[4]**

(i) X-ray imaging

(ii) Endoscopy

(iii) Pacemaker

(iv) Electroencephalograph

Question 9.

(a) (i) Explain the *two* types of immunity. **[2]**

(ii) How does vaccination protect a person from diseases? **[2]**

(b) (i) AIDS is spreading at an alarming rate. Suggest any *two* control measures. **[1]**

(ii) What treatment is available for AIDS patients? **[1]**

(c) Outline any *four* symptoms that indicate the formation of cancer in the human body. **[2]**

(d) What is micro propagation? Mention any *three* advantages of this process. **[4]**

(e) Distinguish between inversion and translocation with the help of a simple diagram. **[3]**

Question 10.

(a) Write any *eight* morphological characters that show evolutionary trends during human evolution. **[4]**

(b) Compare the primitive earth's atmosphere and the present day atmosphere. **[4]**

(c) Explain the biological method of pest control. **[1]**

(d) What is an oxygenator? Explain the *two* types of oxygenators. **[3]**

(e) Outline *six* ways of controlling the abuse of alcohol in your locality. **[3]**