Version No.			

ROLL NUMBER						

Answer Sheet No._____

Sign. of Candidate _____

Sign. of Invigilator _____

BIOLOGY HSSC–I

SECTION – A (Marks 17)

Time allowed: 25 Minutes

Section – A is compulsory. All parts of this section are to be answered on this page and handed over to the Centre Superintendent. Deleting/overwriting is not allowed. **Do not use lead pencil.**

Q.1 Fill the relevant bubble for each part. All parts carry one mark.

1. Identify heteropolysaccharide from the following:
   - A. Chitin ◯ B. Glycogen ◯
   - C. Pectin ◯ D. Cellulose ◯

Result.pk

2. Glycolysis is a process that:
   - A. Produces ATP and NADH ◯
   - B. Produces ATP only ◯
   - C. Is **NOT** a net producer of energy rich molecules ◯
   - D. Consumes as much ATPs is produced ◯

3. Carnivorous adaptations of plants mainly compensate for soil that has relatively low content of:
   - A. Water ◯ B. Calcium ◯
   - C. Nitrogen ◯ D. Potassium ◯

4. Wood consists mainly of:
   - A. Bark ◯ B. Secondary xylem ◯
   - C. Cork ◯ D. Secondary phloem ◯

5. What does the P wave represent in an ECG?
   - A. Depolarization of the atria ◯
   - B. Depolarization of the ventricles ◯
   - C. Repolarization of the ventricles ◯
   - D. Depolarization of the atria and ventricles ◯

6. Photorespiration is a problem for plant growth because it:
   - A. Consumes excess CO_2 during the day ◯
   - B. Consumes excess CO_2 during the day and night ◯
   - C. Effectively undoes the work of photosynthesis by releasing CO_2 ◯
   - D. Provides additional means of releasing energy from fuel molecules ◯

7. In contrast to kingdom Animalia and Plantae, the organisms of kingdom Fungi have:

A. A cell wall ◯ B. Centrioles in cells ◯
C. Heterotrophic mode of nutrition ◯ D. Nuclear mitosis ◯

8. Which one of the following is not common to all divisions of vascular plants?

A. Development of seeds ◯
B. Alternation of generations ◯
C. Xylem and phloem ◯
D. Dominance of diploid generation ◯

9. Which one of the following subdivisions of the animal kingdom includes all the others in the list?

A. Protostomes ◯ B. Deuterostomes ◯
C. Bilateria ◯ D. Coelomates ◯

10. A certain poison disrupts the cytoskeleton of cell. Choose one of the following function that would be affected most probably by the poison?

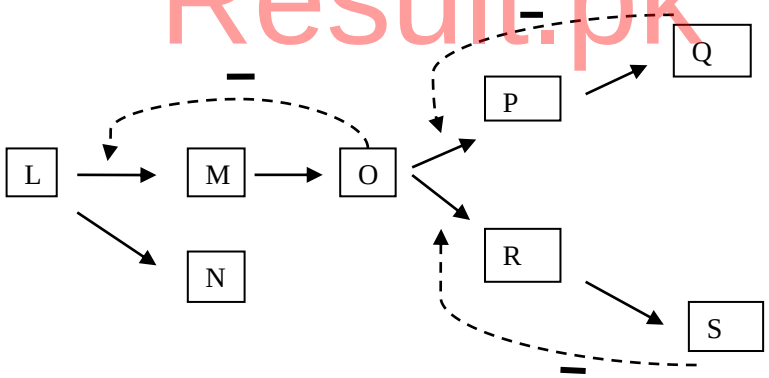
A. Digestion within lysosomes ◯ B. Protein synthesis ◯
C. Cell division ◯ D. Cellular respiration ◯

11. Aslam wants to study the detailed function of glyoxysomes as cell organelles. Suggest one of the following materials that will be more suitable for his research?

A. Muscle cells ◯ B. Mesophyll cells ◯
C. Radish root cells ◯ D. Oil seeds ◯

12. In the following branched metabolic pathway, a dotted line with a minus sign symbolizes inhibition of a metabolic step by an end product:

Result.pk



Which reaction would prevail if both Q and S are present in the cell in high concentration?

A. L → M ◯ B. M → O ◯
C. L → N ◯ D. O → P ◯

13. A microbiologist found that some bacteria infected by bacteriophages had developed the ability to make a particular amino acid that they couldn't make before. This new ability was probably a result of:

A. Conjugation ◯ B. Transduction ◯
C. Induction ◯ D. Transformation ◯

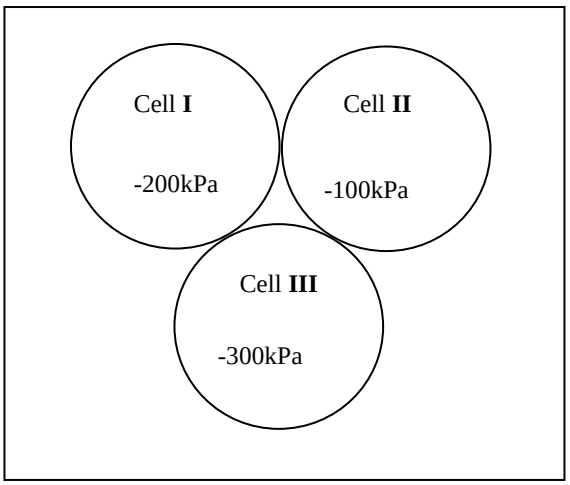
14. Only an animal species with diaphragm can be expected to have:

A. Lungs ◯ B. Hair ◯
C. Feathers ◯ D. Moist skin ◯

15. If a long day plant has a critical night length of 9 hours. Which one of the following 24 hours cycles will prevent flowering?

A. 16 hours light/08 hours dark ◯
B. 14 hours light/10 hours dark ◯
C. 15.5 hours light/8.5 hours dark ◯
D. 08 hours light/08 hours dark/flash of light/08 hours dark ◯

16. The given diagram illustrates three adjacent cells with different water potential:



The direction of movement of water molecules across the given cells would be:

A. **I→II→ III** ◯ B. **III→ II → I** ◯
C. **II→ I→ III** ◯ D. **III→ I → II** ◯

17. After surgical removal of an infected gall bladder a person must be especially careful to restrict his/her intake of:

A. Starch ◯ B. Sugar ◯
C. Fats ◯ D. Protein ◯

Result.pk

Federal Board HSSC-I Examination
Biology Model Question Paper
(Curriculum 2006)

Time allowed: 2.35 hours | Total Marks: 68

Note: Answer any fourteen parts from Section 'B' and attempt any two questions from Section 'C' on the separately provided answer book. Write your answers neatly and legibly.

SECTION – B (Marks 42)

Q.2 Attempt any **FOURTEEN** parts from the following. All parts carry equal marks. (14 × 3 = 42)

i. Define
a. Oligosaccharides b. Autophagy c. Virion

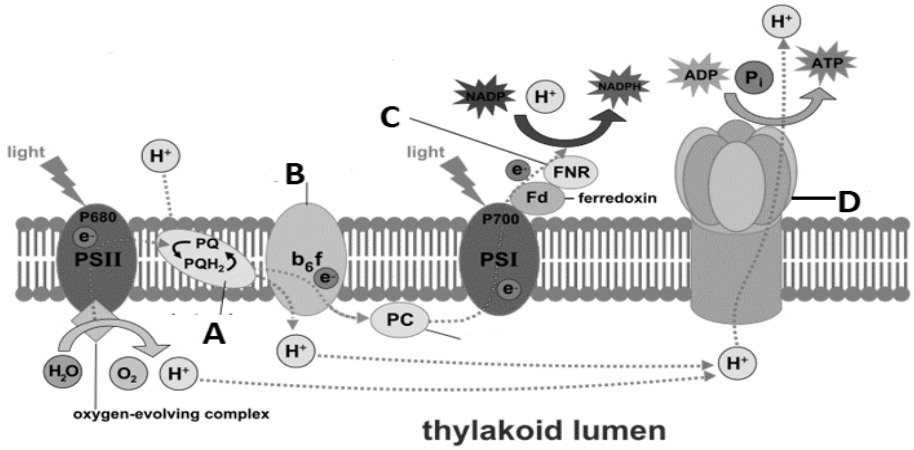
ii. List the unifying features of Archea that distinguish them from Bacteria.

iii. Complete the following table.

Diseases	**Causative Agent**
Tuberculosis	
	Microsporum audouinii
Soft rot in potato	
Athlete's foot	
	Phytophthora infestans
	Salmonella typhi

Result.pk

iv. In the following diagram a segment of thylakoid membrane is depicted showing an important metabolic process.



a. Name the parts labelled as A, B, C and D. (1)
b. Explain the process that is depicted in the diagram. (2)

v. Make a list of the land adaptations of Bryophytes.

vi. Classify animals on the basis of body cavity.

vii. Elaborate the role of Pancreas as an exocrine gland.

viii. List the ways, the fever kills microbes.

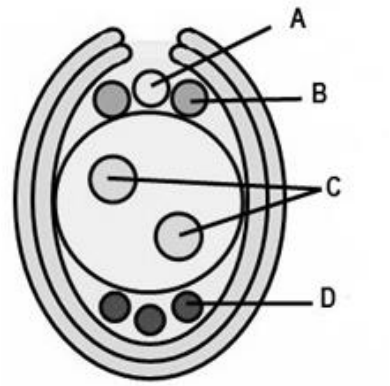
ix. Sketch a graph showing activation energies of enzyme catalyzed and non-enzyme catalyzed reactions.

x. Sketch the life cycle of plasmodial slime mold diagrammatically.

xi. How would you differentiate between Ascomycota and Basidiomycota? Show at least six features in a comparison table.

xii. Give three adaptations of Platyhelminthes for parasitic mode of life.

xiii. Following is the diagram of an ovule of flowering plants.



a. Correctly name the parts labelled as A, B, C and D. (2)
b. Which stage of the life cycle is represented by the 8 labelled cells? (1)

xiv. Complete the following table for the comparison of Chondrichthyes and Osteichthyes.

Features	**Chondrichthyes**	**Osteichthyes**
Position of mouth		
Types of scales		
Endoskeleton made up of		
Caudal fin		
Number of gill pairs		
Operculum		

Result.pk

xv. Differentiate between Hydrophytes and Xerophytes in tabular form for at least six features.

xvi. A particular small polypeptide is nine amino acids long. Using three different enzymes to hydrolyze the polypeptide at various sites, we obtained the following five fragments (N denotes the amino terminal of the polypeptide).

- Alanine-Leucine-Aspartic acid-Tyrosine-Valine-Leucine
- Tyrosine-Valine-Leucine
- N-Glycine-Proline-Leucine
- Aspartic acid-Tyrosine-Valine-Leucine
- N-Glycine-Proline-Leucine- Alanine-Leucine

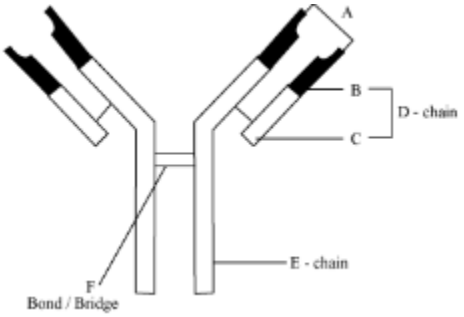
a. Determine the primary structure of this polypeptide. (2)
b. Highlight the significance of amino acid sequence in proteins. (1)

xvii. Apply your knowledge of Fungi to signify their role in genetic research.

xviii. A tip for making cut flowers last longer without wilting is to cut off the ends of stems under water and then transfer the flowers to a vase full of water while drops of water are still present on the cut ends of the stem. Predict why this happens?

xix. Advise some changes in life style that could protect people from hypertension and cardiac problems.

xx. Following is the diagram of an antibody:



a. Correctly mention the names of the parts labelled as A, B, C, D, E and F. (1.5)
b. Which type of human cells produces these antibodies? (0.5)
c. List the four different modes of action of antibodies. (1)

SECTION – C (Marks 26)

Note: Attempt any **TWO** questions. All questions carry equal marks. (2×13 = 26)

Q.3 a. Explain the formation, structure, functional role and disorders related to Lysosomes. **(1.5 x 4 = 6)**

b. Describe the chemical composition of nucleotides showing the structural formulae of all components. **(7)**

Q.4 a. How CO_2 is converted into glucose during light independent reactions of photosynthesis? **(6)**

b. Elaborate the life cycle of HIV in human body. **(7)**

Q.5 a. Explain the mechanism of translocation of organic solutes through phloem in plants? **(4)**

b. Discuss the role of stomach in the process of digestion. **(4)**

c. Elaborate the sequence of events that occur during cardiac cycle of humans. **(5)**

Result.pk

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BIOLOGY HSSC-I
SLOs
(Curriculum 2006)

SECTION – A

Q.1 Choose the correct answer A/B/C/D by filling the relevant bubble for each question.

1. Distinguish the properties and roles of polysaccharides and relate them with the molecular structures of starch, glycogen, cellulose and chitin.
2. Outline the events of glycolysis.
3. State the examples of carnivorous plant.
4. Define growth and explain primary and secondary growth in plants.
5. List the principles and uses of ECG.
6. Rationalize how the disadvantageous process of photorespiration evolved.
7. List the characteristics that distinguish fungi from other groups and give reasons why fungi are classified in a separate kingdom.
8. Describe the general characteristics of vascular plants.
9. - Describe the types of symmetry found in animals.
   - Classify coelomates into protostomes and deuterostomes
10. Describe the types, structure, composition and functions of cytoskeleton.
11. State the structure and functions of the peroxysomes and glyoxysomes in animal and plant cells.
12. Explain feedback inhibition of enzymes.
13. Explain how mutations and genetic recombination lend variability to bacterial reproduction.
14. Describe the general characteristics of amphibians, reptiles, birds and mammals.
15. Classify plants on the basis of photoperiodism and give examples.
16. Explain the movement of water between plant cells, and between the cells and their environment in terms of water potential.
17. Describe the composition of bile and relate the constituents with respective roles.

Result.pk

SECTION – B (Marks 42)

Q.2 Attempt any **FOURTEEN** parts from the following. All parts carry equal marks.
(14 × 3 = 42)

i. a. Distinguish the properties and roles of disaccharides and describe glycosidic bind in the transport disachharides.
   b. Describe the formation, structure and functions of the lysosomes.
   c. Classify viruses on the bases of their hosts and structure.

ii. List the unifying archeal features that distinguish them from bacteria.

iii. Describe important bacterial diseases in man e.g. cholera, typhoid, tuberculosis and pneumonia; emphasizing their symptoms, causative bacteria, treatments and preventive measures. Describe important bacterial diseases in plants in terms of spots, blights, soft rots, wilts and galls; emphasizing their symptoms, causative bacteria, treatments and preventive measures.

iv. Explain the land adaptations of bryophytes.

v. Describe the general characteristics, importance and examples of sponges, cnidarians, platyhelminths, aschelminths, molluscs, annelids, arthropods and echinoderms.
vi. Differentiate pseudocoelomates, acoelomates and coelomates.
vii. Outline the structure of pancreas and explain its function as an exocrine gland.
viii. List the ways the fever kills microbes.
ix. Define energy of activation and explain through graph how an enzyme speeds up a reaction by lowering the energy of activation.
x. - Describe the events of non-cyclic photophosphorylation and outline the cyclic photophosphorylation.
- Describe chemiosmosis and relate it with electron transport chain.
xi. Describe the salient features with examples of protozoa, algae, myxomycota and oomycota as the major groups of protists.
xii. Classify fungi into zygomycota, ascomycota and basidiomycota and give the diagnostic features of each group.
xiii. Explain the life cycle of a flowering plant.
xiv. List the diagnostic characteristics of jawless fishes, cartilaginous fishes and bony fishes.
xv. Describe osmotic adjustments in hydrophytic (marine and fresh water), xerophytic and mesophytic plants.
xvi. Define proteins and amino acids and draw the structural formula of amino acids. Outline the synthesis and breakage of peptide linkages.
xvii. Explain yeast as unicellular fungi that are used for baking and brewing and are also becoming very important for genetic research.
xviii. Explain the movement of water in xylem through TACT mechanism.
xix. List the changes in life styles that can protect man from hypertension and cardiac problems.
xx. Draw the structural model of an antibody molecule.

Result.pk

SECTION – C (Marks 26)

Note: Attempt any **TWO** questions. All questions carry equal marks. (2×13 = 26)

Q.3 a. Describe the formation, structure and functions of the lysosomes. Interpret the storage diseases with reference to the malfunctioning of lysosomes.
b. Describe the molecular level structure of nucleotide.

Q.4 a. Explain the Calvin cycle.
b. Explain the life cycle of HIV.

Q.5 a. Explain the movement of sugars within plants.
b. Describe the structure of stomach and relate each component with the mechanical and chemical digestion in stomach.
c. Describe the flow of blood through heart as regulated by the valves.

* * * * *

BIOLOGY HSSC I

Table of Specifications Grid

	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7	Unit 8	Unit 9	Unit 10	Unit 11	Unit 12	Unit 13	Marks	% age
K (Knowledge)	Q2(i-b) 1	Q1(1) 1 Q2(i-a) 1		Q1(2) 1	Q2(i-c)1	Q2(ii) 3 Q2(iii) 3		Q2(iv) 3	Q2(v) 3 Q2(vi) 3	Q1(3) 1 Q1(4) 1	Q2(vii) 3 Q5(b) 4	Q1(5) 1	Q2(viii) 3	33	28.4%
U (Understanding)	Q3(a) 6	Q3(b) 7	Q2(ix) 3	Q1(6) 1 Q2(x) 3 Q4(a) 6	Q4(b) 7		Q1(7) 1 Q2(xi) 3 Q2(xii) 3	Q1(8) 1 Q2(xiii) 3	Q1(9) 1 Q2(xiv) 3	Q2(xv) 3 Q5(a) 4		Q5(c) 5		60	51.7%
A (Application)	Q1(10) 1 Q1(11) 1	Q2(xvi) 3	Q1(12) 1			Q1(13) 1	Q2(xvii) 3		Q1(14) 1	Q1(15) 1 Q1(16) 1 Q2(xviii) 3	Q1(17) 1	Q2(xix) 3	Q2(xx) 3	23	19.8%
Total Marks	9	12	4	11	8	7	10	7	11	14	8	9	6	116	100%

KEY:

1(1)(01)

Question No (Part No.) (Allocated Marks)

Result.pk