



Federal Board SSC-I Examination

Biology Model Question Paper

Curriculum 2022-2023 (Inclusive Scheme of Studies 2024)

Section - A (Marks 12)

Time Allowed: 20 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.

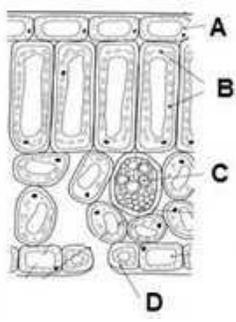
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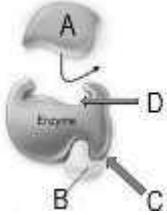
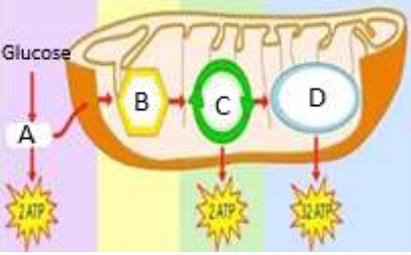
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8	8	8	8
9	9	9	9

Candidate Sign. _____

Invigilator Sign. _____

Q1. Fill the relevant bubble against each question. Each part carries one mark.

S #	Question	(A)	(B)	(C)	(D)	(A)	(B)	(C)	(D)
(i)	Which of the following organelle is NOT present in plant cell?	Centriole	Golgi body	Mitochondria	Ribosomes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(ii)	The statement on the basis of observations is called:	Hypothesis	Deduction	Theory	Law	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(iii)	Identify the correctly matched pair in a cell cycle.	G ₁ - Preparation for cell division	G ₂ - Increase in cell size	S-DNA replication	G ₀ – Cell divides into two	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(iv)	The scientific study of organisms and their evolutionary relationship is called:	Classificati on	Taxonomy	Systematics	Binomial nomenclature	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(v)	The diagram shows cells in part of the leaf of a green plant. Which  region contains cells which are responsible for the transport of water?	A	B	C	D	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(vi)	Non-competitive inhibitors inactivate the enzyme. Identify non-competitive inhibitor in this figure.	A	B	C	D	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

						
(vii)	If tissue level is not developed in the level of organization, which next level will not form?	Molecular level	Atomic level	Organ level	Organelle level	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
(viii)	Which combination of molecules is related to lipids?	Amino acid and glycerol	Glucose and glycerol	Fatty acids and glycerol	Glucose and fatty acids	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
(ix)	Which one of the following is NOT the part of embryo in a seed?	Radicle	Plumule	Endosperm	Cotyledon	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
(x)	The diagram shows an overview of aerobic respiration.  In which labelled process oxygen is used?	A	B	C	D	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
(xi)	The example of vestigial organ is:	Wing of a bird	Flipper of a whale	Arm of man	Appendix in human	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
(xii)	The nitrogenous bases between two DNA strands are held together by:	Ionic Bonds	Hydrogen Bonds	Covalent Bonds	Peptide Bonds	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>



Federal Board SSC-I Examination

Model Question Paper Biology

Curriculum 2022-2023 (Inclusive Scheme of Studies 2024)

Time allowed: 2.40 hours

Total Marks: 48

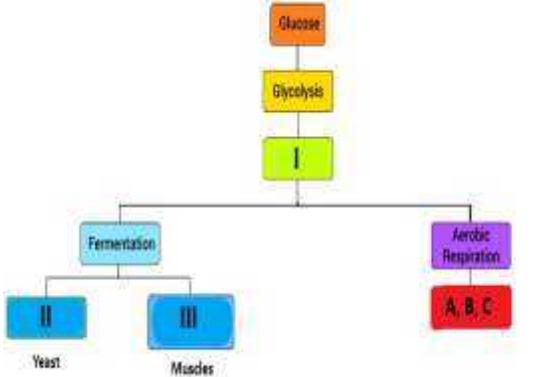
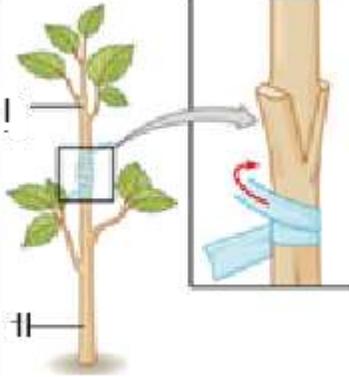
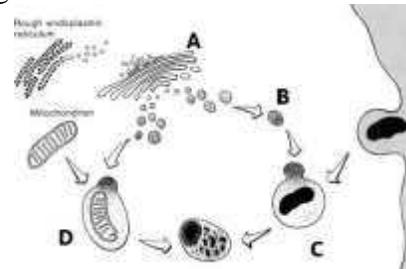
Note: Answer all parts from Section 'B' and all questions from Section 'C' on the **E-sheet**.

Write your answers on the allotted /given spaces.

SECTION-B (Marks 30)

Q.2 Attempt the following questions

(10x3 = 30)

Q#	Question	Marks	Question	Marks										
(i)	Complete the following table by matching the branch of biology with the aspect of living things it describes.	0.5x 6	OR Show the complete taxonomic classification of human beings.	3										
	<table border="1"> <thead> <tr> <th>Branch of biology</th> <th>Aspect of living things described</th> </tr> </thead> <tbody> <tr> <td>Pharmacology</td> <td></td> </tr> <tr> <td></td> <td>Defense against pathogens</td> </tr> <tr> <td>Physiology</td> <td></td> </tr> <tr> <td></td> <td>Classification and naming</td> </tr> <tr> <td></td> <td>Relations between organisms and environment</td> </tr> <tr> <td>Pathology</td> <td></td> </tr> </tbody> </table>				Branch of biology	Aspect of living things described	Pharmacology			Defense against pathogens	Physiology			Classification and naming
Branch of biology	Aspect of living things described													
Pharmacology														
	Defense against pathogens													
Physiology														
	Classification and naming													
	Relations between organisms and environment													
Pathology														
(ii)	The given flow chart illustrates the cellular respiration. Answer the questions related to it:	0.5x 6	OR A method of vegetative propagation in plants is shown here.	1+1 +1										
	 <table border="1"> <tbody> <tr> <td>(a) Name the phases of aerobic respiration</td> <td>(b) Label the products</td> </tr> <tr> <td>A.</td> <td>I</td> </tr> <tr> <td>B.</td> <td>II</td> </tr> <tr> <td>C.</td> <td>III</td> </tr> </tbody> </table>				(a) Name the phases of aerobic respiration	(b) Label the products	A.	I	B.	II	C.	III		
(a) Name the phases of aerobic respiration	(b) Label the products													
A.	I													
B.	II													
C.	III													
	 <p>a. Name the parts labelled as I and II. b. Name the type of vegetative propagation shown and its benefits. c. Give any two examples of plants in which this method is applied.</p>													
(iii)	Compare DNA and RNA in a tabular manner for any six features	0.5x 6	OR Draw the chemical structure of a typical amino acid labelling its components.	3										
(iv)	Describe the role of ATP as energy currency for living systems.	3	OR List the key points of Darwin's theory of natural selection.	3										
(v)	Complete the following table for union of biology with other sciences.	0.5x 6	OR Carefully observe the following diagram.	1+2										
	<table border="1"> <thead> <tr> <th>Interdisciplinary science</th> <th>Aspect of living organisms</th> </tr> </thead> <tbody> <tr> <td></td> <td>Analysis of data related to organisms</td> </tr> <tr> <td>Biochemistry</td> <td></td> </tr> </tbody> </table>				Interdisciplinary science	Aspect of living organisms		Analysis of data related to organisms	Biochemistry					
Interdisciplinary science	Aspect of living organisms													
	Analysis of data related to organisms													
Biochemistry														
														

SECTION– C(Marks18)

(3x6 = 18)

Note: Attempt all questions. Marks of all question are equal.

Q.3	How biological method may help to find the cause of any infectious disease using different steps of biological method.	6	OR	Describe different steps of karyokinesis in mitosis with the help of diagrams.	6
Q.4	Describe structure of enzymes. Explain the role of cofactors and give types of cofactors with examples.	2+1 +3	OR	Describe the internal structure of a typical leaf focusing on all tissue types found in it. Also draw its diagram.	5+1
Q.5	Describe structural advantages of any two animal and two plant cells.	1.5x 4	OR	Compare vegetative propagation and artificial propagation. Which one is better for rapid propagation? Give reasons.	4+2

Federal Board SSC-I Examination
Biology Model Question Paper
(Curriculum 2022-2023)
Alignment of Questions with Student Learning Outcomes

Sr No	Section: Q. No. (Part no.)	Content Domain / Area	Student Learning Outcomes	Cognitive Level *	Allocated Marks in Model Paper
1.	A: Q1(1)	B	[SLO: B-09-D-1] Describe cell as the basic unit of life	K	1
2.	A: Q1(2)	A	SLO: B-09-A-08] Describe the steps of the scientific method that is: Recognition Observation Hypothesis Deduction Experiments Results	K	1
3.	A: Q1(3)	D	[SLO: B-09-D-08] Describe Cell cycle	U	1
4.	A: Q1(4)	B	SLO: B-09-B-07] Define biodiversity and classification	K	1
5.	A: Q1(5)	E	[SLO: B-09-E-08] Explain plant physiology in terms of structures and roles of various plant organs	U	1
6.	A: Q1(6)	F	[SLO: B-09-F-05] Describe competitive, and non-competitive inhibition	U	1
7.	A: Q1(7)	E	[SLO: B-09-E-1] Distinguish between tissues, organs and system with examples from animals and plants	U	1
8.	A: Q1(8)	C	[SLO: B-09-C-4] Outline the structure, function and sources of lipids	K	1
9.	A: Q1(9)	Q	[SLO: B-09-Q-21] Explain sexual reproduction in plants	K	1
10.	A: Q1(10)	F	[SLO: B-09-F-08] Explain aerobic respiration and anaerobic respiration	U	1
11.	A: Q1(11)	B	[SLO: B-09-B-06] Describe evidence of evolution with regards to the following - Paleontology (fossil record) - Comparative anatomy (homologous structures, vestigial structures) - Selective breeding	U	1
12.	A: Q1(12)	C	[SLO: B-09-C-07] Describe briefly the structure of DNA as a double helix macromolecule made of nucleotides with base pairing in between the two helices through complementary base pairing	K	1
13.	B: Q 2 (i)	A B	[SLO: B-09-A-04] Define with examples that biology has many sub-fields. (Cytology) (Embryology) (Genetics) (Molecular Biology) (Pathology) (Ecology) (Marine Biology) (Immunology) (Morphology) (Anatomy) (Histology) (Physiology) (Taxonomy) (Paleontology) (Pharmacology) OR [SLO: B-09-B-11] List the taxonomic ranks of classification	K	3
14.	B: Q 2 (ii)	B Q	[SLO: B-09- F -08] Explain aerobic respiration and anaerobic respiration OR [SLO: B-09-Q-18] Describe the two methods of artificial vegetative propagation (stem cuttings and grafting)	U	3
15.	B: Q 2 (iii)	C	[SLO: B-09-C-07] Describe briefly the structure of DNA as a double helix macromolecule made of nucleotides with base pairing in between the two helices through complementary base pairing & Describe briefly the structure of RNA as single stranded macromolecule made of nucleotides with nitrogenous base overhangs	A	3

		C	OR [SLO: B-09-C-03] Outline the structure and function and sources of proteins with structure of amino acids		
16.	B: Q 2 (iv)	F B	[SLO: B-09- F -06] Discuss the role of ATP as energy currency OR [SLO: B-09-B-01] Explain the theory of evolution by natural selection with example	U	3
17.	B: Q 2 (v)	A D	SLO: B-09- A-05] Relate that biology connects with other natural sciences. Students should be able to distinguish in terms of the broad subject matter the below fields: (Biophysics) (Biochemistry) (Computational Biology) (Biogeography) (Biostatistics) (Biotechnology) (Bio economics) OR [SLO: B-09-D-03] Sketch different sub-cellular organelles (nucleus, mitochondria, cell membranes, etc.) and outline their roles	K	3
18.	B: Q 2 (vi)	Q F	[SLO: B-09- Q-10] Explain the mechanism of food translocation by, the theory of Pressure Flow Mechanism OR [SLO: B-09- F-07] Describe photosynthesis in plants.	U	3
19.	B: Q 2 (vii)	E Q	[SLO: B-09- E-02] Describe the concept of emergent properties as gain in functionalities and how it applies to the following going from sub-cellular organelles to cells - going from cells to tissues - going from tissues to organs - going from organs to systems - going from systems to living organisms OR [SLO: B-09- Q-09] Describe the mechanism of transport of water and salt in plants	A	3
20.	B: Q 2 (viii)	Q D	[SLO: B-09- Q-14] Explain osmotic adjustments in plants OR [SLO: B-09- D-0]} Explain meiosis, mitosis and stages of mitosis, meiosis (by use of sketch of diagrams)	U	3
21.	B: Q 2 (ix)	Q D	[SLO: B-09- Q-21] Explain sexual reproduction in plants OR [SLO: B-09- D-05] Identify different types of cells (mesophyll cell, epidermal cell, neurons, muscle, red blood cell, liver cell) and sketch their structures	K	3
22.	B: Q 2 (x)	B B	[SLO: B-09- B-05] Describe sources of variation which can lead to speciation and evolution OR [SLO: B-09-B-10] List the three distinct domains into which living organisms are broadly classified into	K	3
23.	C: Q3	A D	[SLO: B-09- A-08] Describe the steps of the scientific method that is: Recognition Observation Hypothesis Deduction Experiments Results OR [SLO: B-09- D-0]} Explain meiosis, mitosis and stages of mitosis, meiosis (by use of sketch of diagrams) [SLO: B-09- D-012] outline the significance of mitosis and meiosis.	U	6

24.	C: Q4	F E	[SLO: B-09- F -02] Define Enzymes and describe their characteristics OR [SLO: B-09- E -04] Discuss the different types of tissue come together to form the leaf	U	6
25.	C: Q5	D Q	[SLO: B-09- D -04] Outline structural advantages of plant and animal cells OR [SLO: B-09- Q -16] Distinguish between vegetative propagation and artificial propagation	A	6

**Table of specifications (ToS)
Model Paper Biology Grade IX (SSC I)**

Content Domains/ Area	Domain A: Nature of Science in Biology	Domain B: Evolution and Biodiversity Classification	Domain D: Cells and Sub cells		Domain E: Tissue, Organ and Systems	Domain C: Molecular Biology	Domain F: Metabolism	Domain Q: Plants		Domain B: Evolution and Biodiversity Classification		
Assessment Objectives	Unit 1: The science of biology (A1-A9)	Unit 2: Biodiversity (B7-B13)	Unit 3: Cell (D1-D7, D13)	Unit 4: Cell cycle (D8-D12)	Unit 5: Tissues, organs & organ system (E1-E8)	Unit 6: Molecular biology (C1-C11)	Unit 7: Metabolism (F1-F8)	Unit 8: Plant physiology (Q1-Q14)	Unit 9: Plant reproduction (Q15-Q21)	Unit 10: Evolution (B1-B6)	Total Marks	Percentage
K (Knowledge)	Q1(ii) 1 Q2 (i/f) 3 Q2 (v/f) 3	Q1 (iv) 1 Q2 (i/s) 3 Q2 (x/s) 3	Q1 (i) 1 Q2 (v/s) 3 Q2 (ix/s) 3			Q1 (viii) 1 Q1 (xii) 1			Q1 (ix) 1 Q2 (ix/f) 3	Q2 (x/f) 3	30	27.8%
U (Understanding)	Q3 (f) 6			Q1 (iii) 1 Q2 (viii/s) 3 Q3 (s) 6	Q1 (v) 1 Q1 (vii) 1 Q4 (s)6		Q1. (vi) 1 Q1 (x) 1 Q2(ii/f)3 Q2 (iv/f) 3 Q2 (vi/s) 3 Q4 (f) 6	Q2 (vi/f) 3 Q2 (viii/s) 3	Q2 (ii/s) 3	Q1 (xi) 1 Q2 (iv/s) 3	54	50%
A (Application)			Q5 (f) 6		Q2 (vii/f) 3	Q2 (iii/f) 3 Q2 (iii/s) 3		Q2 (vii/s) 3	Q5 (s) 6		24	22.2%
Total Marks	13	7	13	10	11	8	17	9	13	7	108	
Total Percentage	12%	6.5%)	12%	9.3%	10.2%	7.4%	15.7%	8.3%	12%	6.5%		100%

Note:

- This ToS does not reflect policy, but it is particular to this model question paper.
- Proportionate / equitable representation of the content areas may be ensured.
- The percentage of cognitive Level is 30%, 50%, and 20% for knowledge, understanding, and application, respectively with $\pm 5\%$ variation.
- While selecting alternative questions for Short Response Questions (SRQs) and Extended Response Questions (ERQs), it must be kept in mind that:
 - Difficulty levels of two alternative questions of the internal choice will be same
 - SLOs of the two alternative questions of the internal choice must be different

Key: Question Number (part/ first choice) marks. Example: **Q2 (i/f) 3**, Question Number (part/second choice) marks. Example: **Q2 (i/s) 3**