Federal Board SSC-I Examination
Biology Model Question Paper

National Curriculum 2022-2023 (Inclusive Scheme of Studies 2024)
(50% MCQs & 50% Descriptive)

SECTION - A (Marks 30)

Time Allowed: 1:20 hours

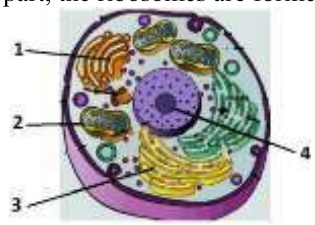
Section – A is compulsory. All parts of this section are to be answered on the OMR Sheet given in the E-Sheet and handed over to the Centre Superintendent. Deleting/ overwriting is not allowed. *Do not use lead pencil.*

Roll Number							Paper Version
							A

Candidate Sign._____ **Invigilator Sign.** _____

Note: Fill the correct bubble for each question on OMR Sheet given in the E-Sheet. Each question carries 0.5 mark.

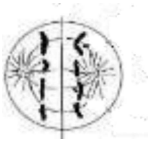
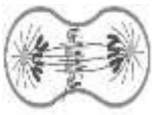
S #	Question	(A)	(B)	(C)	(D)
1.	Biology is considered a subset of natural sciences because it deals with:	natural phenomena without observation or experimentation	only the physical characteristics of living organisms	living organisms and their interactions with nature	living organisms only from a historical perspective
2.	Which statement best describes the teaching of the Quran regarding the nature?	It encourages observation and study of nature	It presents nature mainly as resources for human use.	It discusses nature only in relation to historical events	It encourages appreciation of nature but not its investigation
3.	Pharmacology is related to:	Defense against germs	Study of drugs and their effect	Study of diseases	Study of form and function of body
4.	A group of scientists from Biology and Chemistry work together to develop a new vaccine. Which other field can contribute for quick and accurate development of vaccine?	Computer science	Physics	Mathematics	Geography
5.	Scientists are investigating how a mutation in a gene is passed from one generation to the next. This research belongs to:	Pharmacology	Immunology	Genetics	Physiology
6.	A well-tested explanation supported by evidence but still open to revision is called:	Law	Observation	Hypothesis	Theory
7.	Which kingdom contains eukaryotes with cell walls and an absorptive mode of nutrition?	Fungi	Plantae	Protista	Animalia
8.	Which one of the following best defines “biodiversity”?	The study of living organisms and their environment	The grouping of organisms into categories based on similarities	The variety of living organisms found in a specific area or on Earth	The identification and naming of organisms

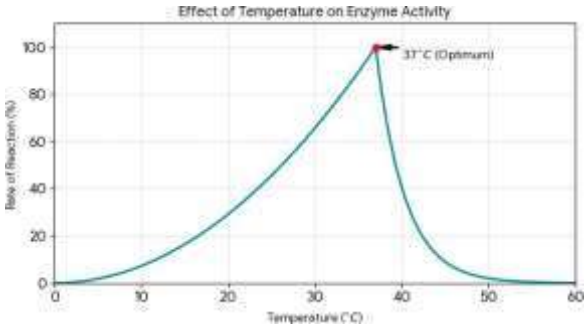
9.	In the taxonomic hierarchy starting from kingdom, which rank comes immediately after **Family**?	Class	Order	Genus	Specie
10.	Earliest classification systems were mainly based on:	Genetic makeup	Cellular structure	DNA sequencing	Physical characteristic
11.	Identify the organelle that plays a role in lipid synthesis and detoxification in a cell.	Chloroplast	Smooth endoplasmic reticulum	Rough endoplasmic reticulum	Golgi Apparatus
12.	Identify the cells that are responsible for coordination within the animal bodies.	Nerve cells	Muscle cells	Epithelial cells	Blood cells
13.	Which example best represents division of labour at the cellular level?	Cell dividing to produce new cells	Nucleus controlling cellular activities	Muscles contracting for movement	Lungs exchanging gases
14.	In which of the following labeled part, the ribosomes are formed? 	1	2	3	4
15.	All of these organelles are involved in protein synthesis and modification **EXCEPT:**				

16. A table differentiating the structural advantage of plant and animal cells is given below. identify the **INCORRECT** row:

	Organelles	**Occurrence**	**advantage in plant cells**	**advantage in animal cells**
A	Centrioles	Absent in plant cell	-	Cell division
B	Cell membrane	Absent in plant cell	-	Selective permeability
C	Cell wall	Absent in animal cell	Structural support and protection.	-
D	Chloroplast	Absent in animal cell	Sites of photosynthesis	-

17.	All of the following are correct about importance of Meiosis, **EXCEPT**:	Genetic stability	Genetic variation.	Sexual reproduction.	Maintenance of number chromosomes in a species.
18.	A student observes a cell where chromosomes are condensed and nuclear membrane is disappearing. This stage is:	Prophase	Metaphase	Anaphase	Telophase
19.	Interphase is important because it:	Divides the cell	Ensures DNA replication	Disintegrates the nuclear membrane	Forms spindle apparatus
20.	In which of the following stage the cells may exit the cell cycle and stop to divide?	G1	G2	S	G0
21.	Which one of the following best explains the role of stem cells?	Transporting oxygen throughout the body	Repair of damaged tissues by forming new cells	Breaking down food into simpler substances	Causing genetic changes in body cells

22.	Which one of the following diagrams correctly represents anaphase-I?				
23.	Identify the structure/region that is involved in the regulation of temperature in the human body:	Lymph nodes	Pituitary gland	Kidney	Hypothalamus
24.	Homeostasis helps the body to:	Change rapidly with environment	Maintain stable internal environment	Control body growth and development	Stimulates digestive activity
25.	Which of the following correctly matches the structure with its level of organization?	Root – Cell	Heart – Tissue	Muscle – Organ System	Brain – Organ
26.	A mitochondrion produces only energy, but a cell can perform all life processes. This shows:	Cells are smaller than organelles	Emergent properties at cell level	All organelles are independent organisms	Organelles survive independently like a cell
27.	The correct sequence of biological organization is:	Tissue → Cell → Organ → System→ organelles	Organelle → Cell → Tissue → Organ → System → Organism	Cell → Organelle → Tissue → Organism → System	Organ → Tissue → Cell → System→ organism
28.	Muscular tissue in the stomach is important for:	Producing enzymes	Mechanical digestion	Chemical digestion	Absorbing nutrients
29.	The cells that are carriers for transfer of genetic information to next generation are:	Gametes	Stem cells	Zygote	Brain cells
30.	Identify which is **NOT** a primary function of lipids?	Act as enzymes	Long-term energy storage	Insulation and protection	Formation of cell membranes
31.	Molecular biology mainly focuses on the study of:	The organs and organ systems	The microscopic organisms around us	Molecules present in cells and their reactions	Formation and breakdown of molecules in soil
32.	What do the Carbohydrates do in our body?	Gaseous transport	Immunity	Instant source of energy	Speed up chemical reactions
33.	A person is suffering from a deficiency of proteins. Which food group will help him to overcome the issue?	Milk, eggs, fish	Oranges, spinach, mangoes	Butter, cheese, oil	Fruits, cereal grains, potatoes
34.	Excess carbohydrates in humans are mainly stored as:	Protein	Glycogen	Cellulose	Vitamins
35.	Which is the correct complementary base pairing in DNA double helix?	Guanine ≡ Adenine	Guanine ≡ Cytosine	Adenine = Cytosine	Thymine = Guanine
36.	In which of the following processes ATP is used as an energy currency?	Osmosis	Active transport	Diffusion	Facilitated diffusion
37.	Which characteristics best indicate the osmotic adjustment in hydrophytes?	Large surface area of leaves	Shedding off the leaves to save water	Closing of stomata to lose water	Spiny leaves
38.	All of these are related to sexual reproduction in plants **EXCEPT**:	Mega spore formation	Microspore formation	Cuttings and grafting	Double fertilization
39.	Which of the following are micronutrient in plants?	Carbon and hydrogen	Phosphorus and Sulphur	Oxygen and nitrogen	Iron and manganese

40	In budding, the offspring is genetically identical to the parent because:	It involves meiosis.	It involves specialized reproductive cells.	It involves mitosis in the parent body.	It involves cross-pollination.	
	STIMULUS/SITUATION/SCENARIO BASED MCQs					
Scenario for MCQ# 41 to 44		**Enzyme activity increases with temperature, reaches a peak at 37°C, and then sharply declines.** 				
41	The peak of the graph represents:	Denaturation point	Optimum temperature	Freezing point	Substrate loss	
42	Why the reaction was not taking place at 0°C	Amount of substrate was very low	Enzymes were denatured	Enzymes were inactive	Large number of inhibitors were present	
43	The sharp decline after peak is due to:	Increased enzyme activity	Denaturation of enzyme	More ATP production	More substrate	
44.	If enzyme concentration is increased at 50°C, what will be the effect on reaction:	Show no change in reaction rate	Increase the rate of reaction even after 50°C	Shift optimum temperature to higher value	More products will be formed	
Scenario for MCQ# 45 to 48		**A plant is placed in a hot, dry environment. After some time:** • **Leaves wilt** • **Water movement slows** • **Sugar transport becomes inefficient**				
45.	Wilting occurs mainly due to failure of:	Phloem transport	High rate of Transpiration	Slow Respiration	Slow gaseous exchange	
46.	Reduced water availability affects photosynthesis because:	Leaves become enlarged	Chlorophyll is destroyed	Stomata close, reducing CO_2 intake	Oxygen production increases excessively	
47.	Food transport is affected because:	Xylem breaks down	Pressure flow mechanism depends on water balance	Oxygen increases	Phloem is damaged	
48.	Which pair of plant tissues is mainly responsible for transporting water and sugars in the plant?	Xylem and phloem	Epidermis and cortex	Parenchyma and collenchyma	Meristem and epidermis	
Scenario for MCQ# 49 to 52		**Two cells are observed under different conditions of respiration:** • **Cell A: High oxygen, high ATP, no lactic acid** • **Cell B: Low oxygen, low ATP, lactic acid present**				
49.	Cell **A** is performing:	Anaerobic respiration	Aerobic respiration	Transport oxygen	Low metabolism	
50.	Cell **B** is most likely found in:	Resting muscle cell	Active exercising muscle	Mesophyll cells in plants	Bone cell	
51.	Which of the following information is correct about Cells A and B?	Cell A is performing Aerobic respiration	Cell B is performing Aerobic respiration	Both Cell A and Cell B are performing Aerobic respiration	Both Cell A and Cell B is performing Anaerobic respiration	

52.	Compared to Cell A, Cell B produces less ATP because:	Glucose is not available	Oxygen is not used for complete oxidation	Cell B is a plant cell	Cell B is a prokaryotic cell	
Scenario for MCQ# 53 to 56		**A gardener is trying to grow new plants from an existing rose plant. In different trials, he uses methods like burying a stem in soil, cutting a stem and planting it and using tissue culture in a lab**				
53.	A gardener buries a rose stem in the soil while it is still attached to the main plant and it grows new roots. What is this method called?	Artificial propagation through cutting	Natural vegetative propagation through layering	Artificial propagation through grafting	Sexual reproduction through seeds	
54.	A gardener cuts off a healthy rose stem and plants it in wet soil, where it grows roots and becomes a new plant. What is this process called?	Natural vegetative propagation	Sexual reproduction	Artificial propagation through grafting	Artificial propagation through cutting	
55.	Which of the following best explains the **main difference** between vegetative propagation and artificial propagation in the above scenario?	Vegetative propagation involves seeds, artificial does not	Vegetative propagation occurs naturally, artificial requires human involvement	Artificial propagation occurs only in labs	Vegetative propagation produces variation, artificial does not	
56.	If the gardener observes that all newly grown plants are genetically identical to the parent plant, what can be concluded?	Sexual reproduction has occurred	Only artificial propagation produces identical plants	Both vegetative and artificial propagation can produce identical plants	Mutation has occurred	
Scenario for MCQ# 57 to 60		**A biology student studying the Darwin's theory of evolution and learns that the human appendix and tailbone are reduced organs with little or no function at present.**				
57.	The appendix is an example of:	Damaged structure	Vestigial structure	Analogous structure	Functional organ	
58.	This type of structures indicates that:	Organisms remain unchanged over time	Evolution has occurred over generations	Humans are the most advanced organisms	Only complex animals undergo evolution	
59.	Why are these structures reduced?	They never had any function in ancestors	They are artificially created by humans	They are newly evolved structures in modern organisms	They lost function over generations	
60.	Which of the following is another example of a such type of structure?	Hind limb bones of snake	Human heart	Bird wings	Fish gills	

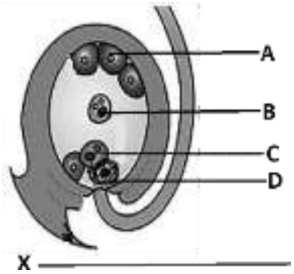
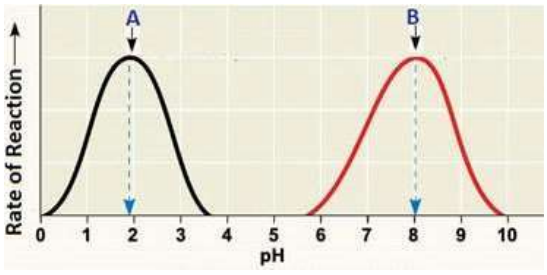
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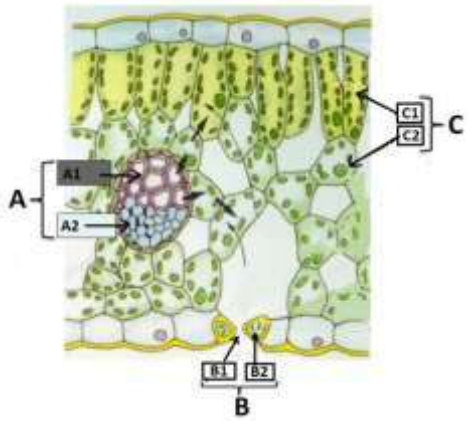
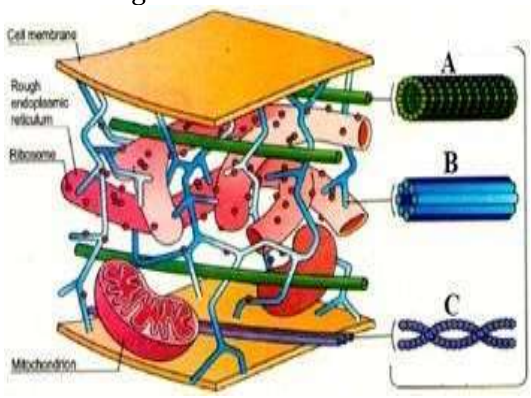
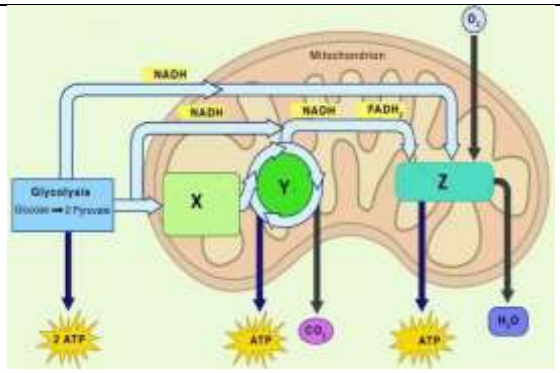
Note: Answer all parts from Section 'B' and 'C' on the **E-sheet at specifically provided space.**
Write your answers on the allotted /given spaces.

SECTION-B (3x6 = 18 Marks)

1.	Define binomial nomenclature. Give scientific names of one animal and one plant using binomial nomenclature.	1+1 +1	**OR**	The given diagram X is a plant structure. Identify X and name the parts labeled as A, B, C and D. 	1+2
2.	Define the primary structure of proteins. Sketch general formula of an amino acid. Mention the role of proteins in defense of body.	1+1 +1	**OR**	Write three characteristics of a good hypothesis.	3
3.	Differentiate micronutrients and macronutrients. State one important role of magnesium and one important role of nitrogen in the life of plants.	1+2	**OR**	Write any three important observations carried out by A.F.A King about the spread of Malaria?	1+1 +1
4.	Give THREE differences by comparing the structure of DNA and RNA.	1+1 +1	**OR**	How variations and adaptations are related to evolution?	1.5 + 1.5
5.	Sketch the diagram and label the components of an Angiospermic seed.	1.5+ 1.5	**OR**	Enlist any two main events that occur during Prophase-I of meiosis and draw diagram.	2+1
6.	Compare anaphase-I of meiosis with anaphase of mitosis and draw labeled diagrams.	1.5 + 1.5	**OR**	Enzyme activity is affected by different factors including pH and temperature. The graph shows the activity of two human enzymes Pepsin and Trypsin at different pH values and normal body temperature (37°C).  **a.** Relate the peak A and B with relevant enzyme with justification of your answer. **b.** Mention the site of action of both	2+1

				enzymes in the human body.	

SECTION-C (2x6 = 12 Marks)

7.	Recall your knowledge about the tissues, organs and organ system in plants and animals to answer the following questions. (a) Mention the role of parts labelled as **A** (tissue), **B**(structure) and **C**(tissue) in plant leaf.  (b) How respiratory and urinary systems of the human body work to maintain homeostasis?	1+1+ 1 1.5+ 1.5	**OR**	Recall your knowledge about cell structure and function to answer the following questions. (a) State chemical composition of the labeled components: A, B and C and explain their role in cell structure and functioning?  (b) How lysosomes are produced? Give their roles in autophagy and intracellular digestion.	1+1+ 1 1+1+ 1
8.	 Given diagram shows the steps of aerobic respiration. Describe the steps X, Y and Z of aerobic respiration in detail. Mention the types and number of reactants, products and energy molecules in all steps (X, Y and Z).	2+2+2	**OR**	Transpiration and excretion are important processes for homeostasis in plants. a. A gardener notices that trees shed their yellow leaves in autumn and central part of woody stem become darker and hard over time. Explain both observations in terms of excretion. b. Why there are higher chances of wilting of plants on hot sunny day? How plants survive in such harsh conditions?	1.5+ 1.5 1.5+ 1.5