

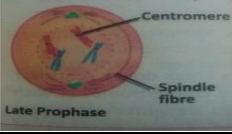
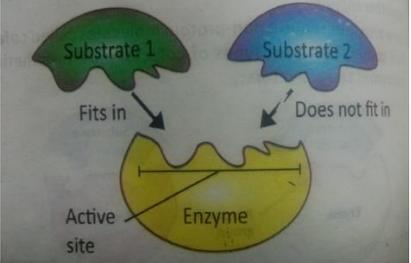
MARKING SCHEME BIOLOGY MODEL PAPER CLASS 9

SCORING KEY SECTION: A (MCQs)

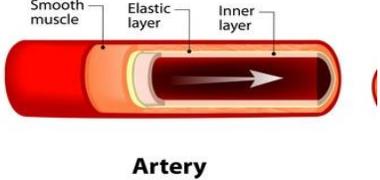
MCQ #	OPTION	ANSWER
1	B	Microbiology
2	C	It is proposed statement to answer the problem
3	A	Classification
4	D	Centriole
5	A	Cell membrane does not spend energy when molecules diffuse through it
6	A	RNA, ribosomes and several enzymes are synthesized
7	C	Apoptosis and division
8	C	geometric shapes.
9	D	Carbon dioxide and water
10	B	Low.
11	B	Blood clotting
12	C	Xylem vessels of leaf

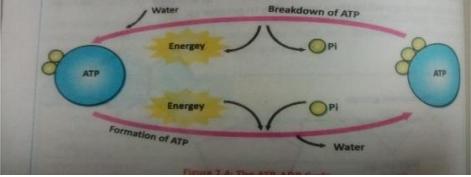
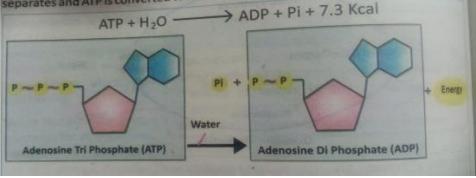
RUBRICS
SECTION-B

Q.NO 1	Question	Reference										
i.	<p>Complete the organization levels against each example.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th style="text-align: center;">Example</th> <th style="text-align: center;">Organization level</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">Stomach</td> <td></td> </tr> <tr> <td style="text-align: center;">Man</td> <td></td> </tr> <tr> <td style="text-align: center;">Glucose</td> <td></td> </tr> <tr> <td style="text-align: center;">Ribosome</td> <td></td> </tr> </tbody> </table>	Example	Organization level	Stomach		Man		Glucose		Ribosome		Textbook Biology 9 th KPK, Textbook Board Peshawar
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Stomach	Organ											
Man	Organism											
Glucose	Molecule											
Ribosome	Organelles											
Marking Hints	One mark for each correct organization level 1+1+1+1= 4 marks	Textbook Biology 9 th KPK, Textbook Board Peshawar										
ii.	<p>Briefly explain the following FOUR distinguishing characteristics of kingdom Protista. a. Cell type b. nuclear envelope c. cell wall d. mode of nutrition</p>	Textbook Biology 9 th KPK, Textbook Board Peshawar										
Possible answer	<p>a. Cell type: Eukaryotic unicellular- colonial or simple multicellular b. Nuclear envelope: Present c. Cell wall: Present in some forms, various types d. Mode of nutrition: Photosynthetic or heterotrophic or combination of these.</p>											
Marking Hints	One mark for each correct distinguishing characteristic of kingdom Protista 1+1+1+1= 4 marks											
iii.	<p>Write a short note on electron microscope keeping in view its radiation type, lenses, magnification and images.</p>	Textbook Biology 9 th KPK, Textbook Board Peshawar										
Possible answer	<p>Radiation type: Beams of electrons Lenses: Magnetic Magnification: 100 times greater than light Images: TEM shows 2D while SEM shows 3D images</p>											
Marking Hints	One mark for correct description of each part of electron microscope 1+1+1+1= 4 marks											
iv	<p>Define turgor and write any TWO points to show its importance in plants.</p>	Textbook Biology 9 th KPK, Textbook Board Peshawar										
Possible answer	<p>Turgor: The pressure which is exerted by the cytoplasm against the cell wall is known as turgor pressure and the phenomenon is called turgor. Importance of turgor in plants: i. It plays an important role in maintaining the shape of the plant. ii. It provides supports to plants especially in young tissues. iii. It helps in closing and opening of the stomata. iv. Some flowers open during the day time and close at night. This is also due to change in turgor in the cells of sepals of flowers.</p>											
Marking Hints	i. Correct definition of turgor: 2 marks ii. One mark for each correct importance of turgor in plants: TWO required 2+1+1= 4 marks											

v.	How is a prokaryotic cell different from a eukaryotic cell in terms of nucleus, cell membrane, cell wall and size.			Textbook Biology 9 th KPK, Textbook Board Peshawar
Possible answer	Component	Prokaryotic cell	Eukaryotic cell	
	Nucleus	They lack membrane bound nucleus.	The nuclear material is surrounded by a double membrane.	
	Membrane organelles	Membrane bounded organelles are absent.	Membrane bounded organelles are present.	
	Cell wall	Cell wall is made of peptidoglycan (a singular larger polymer of amino acids and sugar).	Cell wall is made cellulose (plants) or chitin (fungi).	
Size	Comparatively smaller in size (0.5nm)	Larger in size (10-100nm)		
Marking Hints	One mark for each correct difference between prokaryotic cell and eukaryotic cell 1+1+1+1+ 4 marks			
Vi.	Enlist the events (and show with diagram) through which mitotic apparatus is formed in prophase in animal cells.			Textbook Biology 9 th KPK, Textbook Board Peshawar
Possible answer	i. In animal cell, <u>when two parts of centrioles reach opposite pole of the cell. They make a network of spindle fibers between the two poles.</u> The complete set of spindle fiber forms mitotic apparatus.			
	ii. Correct label diagram of late prophase. 			
Marking Hints	i. These TWO underline events required. 1 mark for each correct events. 1+1= 2 marks iii. Correct label diagram of late prophase. 2 marks Total marks 2+2= 4 marks			
vii.	How are enzymes specific for their substrate? Justify it with the help of diagram of shape of active site of enzyme and its specificity. Also give its TWO examples.			Textbook Biology 9 th KPK, Textbook Board Peshawar
Possible answer	Enzyme specificity: Diagram			
	 Examples: Enzyme protease: Speed up the digestion of protein only. Enzyme amylase: Works for the digestion of starch only. Enzyme cellulose: Speed up the digestion of cellulose only. Enzyme lipase: Digests lipase only.			
Marking Hints	Correct diagram of enzyme specificity: 2 marks (1 mark for each correct example of enzyme specificity) only TWO required. 2+1+1= 4 marks			

viii.	Both respiration and photosynthesis are important for living organisms. How are these two processes opposite to one another? Write FOUR differences between respiration and photosynthesis.		
Possible answer	Differences between respiration and photosynthesis		Textbook Biology 9 th KPK, Textbook Board Peshawar
	Respiration	Photosynthesis	
	It is energy releasing process.	It is an energy storing process.	
	Stored energy of food molecules is released for cellular activities.	Energy of sunlight is trapped by the chlorophyll and converted into chemical energy and stored in organic food molecules.	
	Glucose and oxygen are the raw materials while carbon dioxide and water are the products.	Carbon dioxide and water are used as raw materials while glucose and oxygen are the products.	
	Oxygen is required in aerobic respiration.	Oxygen is liberated as by product.	
	It takes place in all the cells of all living organisms.	It takes place only in green cells of plants, algae and some bacteria.	
	It is destructive (catabolic) process during which organic food molecules are broken and energy is released.	It is constructive (anabolic) process during which organic food molecules are synthesized and energy is stored.	
	Due to respiration, loss of weight occurs.	Due to photosynthesis, plant body gains weight.	
	It occurs round the clock, day and night. It does not require sunlight.	It occurs during the daytime when sunlight is available which is necessary for it.	
Marking Hints	One correct difference between respiration and photosynthesis contains ONE mark: Only FOUR required. 1+1+1+1= 4 marks		
ix.	Write any FOUR deficiency symptoms of vitamin D.		
Possible answer	<u>Deficiency symptoms of vitamin D.</u>		Textbook Biology 9 th KPK, Textbook Board Peshawar
	<ul style="list-style-type: none"> • Bones can become thin, brittle and soft. • In children vitamin D deficiency leads to rickets (condition in which bones weaken and bow under pressure). • In adults, vitamin D deficiency symptom causes osteomalacia (soft bones). • Vitamin D deficiency symptom also causes fractures. <p>Note: Any other related or correct deficiency symptom of vitamin D out of textbook may be considered.</p>		
Marking Hints	One correct deficiency symptom of vitamin D contains ONE mark: Only FOUR required. 1+1+1+1= 4 marks		
x.	List any FOUR functions of plasma in human body.		
Possible answer	<u>FUNCTIONS OF PLASMA IN HUMAN BODY</u>		Textbook Biology 9 th KPK, Textbook Board Peshawar
	<ul style="list-style-type: none"> • Plasma keeps all the tissues moist. • Plasma of the blood transport nutrients, water, salt, hormones and waste materials. • Plasma helps in regulating body temperature. • Small amount of oxygen is also carried by plasma. Most of the carbon dioxide is carried by plasma. • Plasma proteins e.g. albumins maintain the osmotic pressure of blood • Important plasma proteins called antibodies defend the body against pathogens. • Another plasma protein fibrinogen is responsible for blood clotting. 		

Marking Hints	One correct function of plasma contains ONE mark: Only FOUR required. 1+1+1+1= 4 marks	
xi.	Why are arteries important? Draw a labelled diagram of an artery.	Textbook Biology 9 th KPK, Textbook Board Peshawar
Possible answer	<p><u>IMPORTANCE OF ARTERIES.</u> <u>All the arteries carry oxygenated blood from heart to other organ of the body except pulmonary arteries which carry deoxygenated blood to lungs.</u> Diagram of Artery:</p> 	
Marking Hints	Correct explanation of the importance of arteries contains 2 marks and 2 marks for correct label diagram of artery. 2+2= 4 marks	
SECTION C		
2.	<p>i. Explain the applications of mathematics rules used in biology research work. (3) ii. Define the term conservation. Write any THREE examples of the steps taken in Pakistan to conserve biodiversity. (1+3)</p>	
Possible answer	<p>i. <u>APPLICATIONS OF MATHEMATICS RULES USED IN BIOLOGY RESEARCH WORK</u></p> <ul style="list-style-type: none"> • Population studies • Drugs studies • Sequencing of plants and animals • DNA <p>All the above fields of biology require mathematical knowledge/ rules for organizing and analyzing data.</p> <p>ii. <u>CONSERVATION</u> Conservation means to <u>use the resources such as plants, animals, minerals and water in a sensible way.</u> <u>Examples of steps taken in Pakistan for conservation of biodiversity</u></p> <ul style="list-style-type: none"> • Indus Dolphin Project (IDP) to save Indus Dolphin • Projected Areas Management Project in Machian in Azad Jammu Kashmir • Marine Turtle Conservation Project • Ban on the hunting of markhor and urial in Balochistan • Himalayan Jungle Project to protect the biodiversity in Himalayan region • Conservation of migratory birds in Chitral, Khyber Pakhtunkwa • Himalayan Wildlife Project to check the hunting of brown bears • Conservation of Chiltan Markhor • Ban on Bear-baiting in Pakistan 	Textbook Biology 9 th KPK, Textbook Board Peshawar
Marking Hints	<p>i. <u>APPLICATIONS OF MATHEMATICS RULES USED IN BIOLOGY RESEARCH WORK</u> One marks for each correct application of mathematics in biology research area. Only THREE required. 1+1+1= 3 marks</p>	

	<p>ii. Correct definition of conservation contains ONE mark. 1 mark One mark for each correct examples of steps taken in Pakistan for conservation of biodiversity. Only THREE required. $1+1+1= 3$ marks Total marks for (ii) $1+1+1+1= 4$</p>	
3.	<p>i. Briefly explain following animal tissues. a. Fibrous connective tissues b. Smooth muscles c. Nervous tissues d. Epithelial tissue (4) ii. Define Cell Cycle and write names of its TWO main stages. (1+2)</p>	Textbook Biology 9 th KPK, Textbook Board Peshawar
Possible answer	<p>i. Animal Tissues a. Fibrous connective tissues: Its extracellular material contains tightly packed collagen fibers. It is the form of tendon which attaches muscles to bones and ligaments join two bones. b. Smooth muscles: These are found in the walls of hollow structures such as blood vessels, gut etc. They produce slow contractions. c. Nervous tissues: It is composed of nerve cells which are called neurons. Neurons are capable of transmitting nerve impulses to conduct messages in the whole body. d. Epithelial tissue: The skin is made of epithelial tissue, which is in the form of continuous sheets of cells. Epithelial tissue also lines the gut, lungs and urinary tract. ii. Cell Cycle: The series of events that take place in a eukaryotic cell leading to its replication is called cell cycle. Main stages of cell cycle</p> <ul style="list-style-type: none"> • Interphase or resting stage • Division phase (Mitosis or Meiosis) 	
Marking Hints	<p>i. Animal Tissues ONE mark for each correct brief description of given tissue. (1+1+1+1) = 4 marks ii. Cell Cycle: ONE mark for correct definition of cell cycle. 1 mark Main stages of stages of cell cycle: ONE mark for each correct name of the stage of cell cycle. 1+1 = 2 marks (1+2) Total marks= 3</p>	
4.	<p>i. Why is mitochondrial enzyme called intracellular? Give justification. (3) ii. Explain the synthesis and breaking of ATP through ATP-ADP cycle with proper diagrams. (4)</p>	Textbook Biology 9 th KPK, Textbook Board Peshawar
Possible answer	<p>i. Why is mitochondrial enzyme called intracellular? All enzymes are synthesized inside cells. Mitochondrial enzyme also work inside the cells so it is also called intracellular enzymes. ii. Synthesis and breaking of ATP through ATP-ADP cycle Synthesis: ATP molecules are constantly broken by the cell into ADP and inorganic phosphate and energy is obtained.</p>  <p>Breaking of ATP: ATP molecules are constantly regenerated from ADP and phosphate using energy released from the breakdown of food. This is how constant cycle of ATP breakdown and reformation goes on in the living cells.</p> 	

Marking Hints	<p>i. Correct description of mitochondrial enzyme as intracellular contains THREE mark. 3 marks</p> <p>ii. Synthesis: Correct description contains ONE mark and ONE mark of correct diagram. 2 marks</p> <p>Breaking of ATP: Correct description contains ONE mark and ONE mark of correct diagram. 2 marks</p> <p>Total marks (3+2+2) 7 marks</p>												
5	<p>i. State symptoms, causes and preventions of the diarrhea. (1+1+1)</p> <p>ii. Differentiate between Atherosclerosis and Arteriosclerosis (2+2)</p>												
Possible answer	<p>i. State symptoms, causes and preventions of the diarrhea. (1+1+1)</p> <table border="1" data-bbox="365 712 1307 981"> <thead> <tr> <th colspan="2" style="text-align: center;">DIARRHEA</th> </tr> </thead> <tbody> <tr> <td>Symptoms</td> <td>frequent, watery, loose bowel movement, abdominal pain, nausea and vomiting</td> </tr> <tr> <td>Causes</td> <td>bacterial infection, viral or parasitic infection of the colon walls</td> </tr> <tr> <td>Prevention</td> <td>can be prevented by taking sufficient amounts of clean water and food</td> </tr> </tbody> </table> <p>ii. Differentiate between Atherosclerosis and Arteriosclerosis (2+2)</p> <table border="1" data-bbox="365 1088 1307 1626"> <thead> <tr> <th>Atherosclerosis</th> <th>Arteriosclerosis</th> </tr> </thead> <tbody> <tr> <td>It is characterized by the deposition of fatty material e.g. cholesterol inside the arteries. Due to this, the lumen (interior) of the artery becomes narrow and blood flows with difficulty. Later, the artery may completely be blocked. Some obvious reasons of atherosclerosis are hypertension, smoking, diabetes mellitus and increased lipid level in blood</td> <td>It is the hardening of the arteries due to the deposition of calcium in the walls of the arteries. Such artery cannot expand when blood is pumped with pressure into it with systole. Due to this inflexibility makes the heart to work hard. This disorder occurs with increasing age.</td> </tr> </tbody> </table>	DIARRHEA		Symptoms	frequent, watery, loose bowel movement, abdominal pain, nausea and vomiting	Causes	bacterial infection, viral or parasitic infection of the colon walls	Prevention	can be prevented by taking sufficient amounts of clean water and food	Atherosclerosis	Arteriosclerosis	It is characterized by the deposition of fatty material e.g. cholesterol inside the arteries. Due to this, the lumen (interior) of the artery becomes narrow and blood flows with difficulty. Later, the artery may completely be blocked. Some obvious reasons of atherosclerosis are hypertension, smoking, diabetes mellitus and increased lipid level in blood	It is the hardening of the arteries due to the deposition of calcium in the walls of the arteries. Such artery cannot expand when blood is pumped with pressure into it with systole. Due to this inflexibility makes the heart to work hard. This disorder occurs with increasing age.
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Marking Hints	<p>i. ONE mark for each correct symptom, causes and prevention of Diarrhea. 1+1+1= 3 marks</p> <p>ii. TWO marks for correct description (differences) of Atherosclerosis. 2 marks</p> <p>TWO marks for correct description (differences) of Arteriosclerosis. 2 marks</p> <p>Total Marks: 1+1+1+2+2= 7 marks</p>												