APOLLO

FBISE Biology Class 9
Topical workbook - Volume 2 of 3

140 questions arranged by official framework topic.
National Curriculum 2022-23; supported examinations from 2027.

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Molecular biology

Domain C: Molecular Biology

FBISE model paper | Section A Q1(xii) | 1 mark

(xii)	The nitrogenous bases between two DNA strands are held together by:	Ionic Bonds	Hydrogen Bonds	Covalent Bonds	Peptide Bonds

FBISE model paper | Section B Q2(iii) OR | 3 marks

Draw the chemical structure of a typical amino acid labelling its components.	3

FBISE model paper | Section B Q2(iii) | 3 marks

(iii)	Compare DNA and RNA in a tabular manner for any six features	0.5x 6

First Annual 2026 | Section B Q2(iv) OR | 3 marks

	In a cell, a nucleic acid contains uracil instead of thymine. Name the molecule and explain one structural difference from DNA. ایک سیل میں ایسا نیوکلک ایسڈ پایا جاتا ہے جس میں تھائمین کی بجائے یوراسل موجود ہو۔اس	03

First Annual 2026 | Section C Q3 | 5 marks

Q.3	Explain any five functions of carbohydrates in living organisms. جانداروں میں کاربوہائیڈریٹس کے کوئی سے پانچ افعال تفصیلاً بیان کریں۔	05

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Cell

Domain D: Cells and Subcellular Organelles

FBISE model paper | Section A Q11 | 0.5 marks

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

FBISE model paper | Section A Q12 | 0.5 marks

12.	Identify the cells that are responsible for coordination within the animal bodies.	Nerve cells	Muscle cells	Epithelial cells	Blood cells

FBISE model paper | Section A Q13 | 0.5 marks

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

FBISE model paper | Section A Q14 | 0.5 marks

14.	In which of the following labeled part, the ribosomes are formed? 	1	2	3	4

FBISE model paper | Section A Q16 | 0.5 marks

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	-

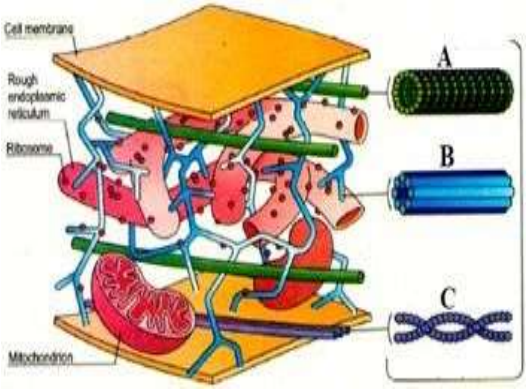
17.	All of the following are correct about importance of Meiosis, **EXCEPT**:	Genetic stability	Genetic variation.	Sexual reproduction.	Maintenance of number chromosomes in a species.
18.	A student observes a cell where chromosomes are condensed and nuclear membrane is disappearing. This stage is:	Prophase	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

FBISE model paper | Section A Q21 | 0.5 marks

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

FBISE model paper | Section A Q26 | 0.5 marks

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

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

First Annual 2025 | Section A Q4 | 1 mark

4.	Which organelle is considered as protein factory of cell?	Mitochondria	Nucleus	Ribosome	Lysosome

First Annual 2025 | Section B Q2(v) OR | 3 marks

OR	State any three structural advantages of a plant cell. پودوں کے سیل کے کوئی سے تین ساختی فوائد تحریر کریں۔	1x3

First Annual 2025 | Section C Q5 | 5 marks

Q.5	Draw labeled sketch of nucleus. Explain its structure and function. نیوکلیئس کا لیبل شدہ خاکہ بنائیں اور اس کی ساخت اور کام کی وضاحت کریں۔	1+2 +2

First Annual 2025 | Section A Q4 | 1 mark

3.	_____ is a group of related genera. ایک جیسی جینس کے متعلقہ گروپ کا ٹیکسانومک درجہ کون سا ہوتا ہے؟	فیملی	آرڈر	کلاس	فائیلم
4.	Identify organelle which lacks its own DNA:	Nucleus	Chloroplast	Mitochondria	Golgi complex

First Annual 2025 | Section A Q5 | 1 mark

5.	If tissue is not formed at a certain level of organization, which next level will not form?	Atomic level	Molecular level	Organelle level	Organ level

First Annual 2025 | Section B Q2(i) OR | 3 marks

SECTION – B (Marks 66)

Q. 2 Attempt the following parts. (11 x 3 =33) سوال نمبر۔2 درج شدہ اجزاء کے مختصر جوابات تحریر کریں۔

(i) Complete the table: ٹیبل مکمل کریں: **03**

Branch of Biology بائیولوجی کی شاخ	Area of study ایریا آف سٹڈی
Pathology پیتھالوجی	
	Microscopic study of tissues ٹشوز کا خوردبینی مطالعہ
Paleontology پیلینٹولوجی	

OR

Complete the table: ٹیبل مکمل کریں: **03**

Cytoskeleton unit سائیٹوسکلیٹن کا یونٹ	Protein unit پروٹین یونٹ
Intermediate filament انٹرمیڈیٹ فلامنٹ	
	Tubulin ٹیوبولن
Microfilaments مائیکروفلامنٹ	

(ii) What is meant by alternation of generation?

Outline taxonomic hierarchy of pea up to taxon of phylum

First Annual 2025 | Section B Q2(v) OR | 3 marks

OR	Draw a labeled fluid mosaic model of cell membrane. سیل کی جھلی کے فلوئڈ موزیک ماڈل کا لیبل شدہ خاکہ بنائیں۔	03

First Annual 2025 | Section C Q5 | 5 marks

	سے افعال کی وضاحت کریں۔	
Q.5	Draw a labeled sketch of Golgi apparatus. Explain its structure and function. گالجی اپریٹس کا لیبل شدہ خاکہ بنائیں اور اس کی ساخت اور کام کی وضاحت کریں۔	1+2 +2

Second Annual 2025 | Section B Q2(iii) OR | 3 marks

Sketch an animal cell and label its any four parts. ایک جانور کا سیل بنائیں اور اس کے کوئی سے چار حصے لیبل کریں۔	1+2

Second Annual 2025 | Section B Q2(x) OR | 3 marks

Sketch mitochondria and label four of its parts. مائیٹوکانڈریا کی شکل بنائیں اور چار حصے لیبل کریں۔	1+2

Second Annual 2025 | Section C Q4 | 5 marks

Q.4	Explain the structure of nucleus. Also draw its diagram. نیوکلئیس کی ساخت کی وضاحت کریں۔اس کی ڈائیگرام بھی بنائیں۔	**2.5+ 2.5**

First Annual 2026 | Section B Q2(vii) | 3 marks

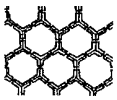
vii)	Muscle cells contain many mitochondria. How this structural feature is advantageous for their function? Justify.	**03**

First Annual 2026 | Section C Q3 | 6 marks

Q.3	Sketch and label Lysosome, Vacuole and Centriole. Also write one role of each in the cell.	2+2 +2

First Annual 2026 | Section A Q12 | 1 mark

12. Which cells contain more chloroplasts for photosynthesis?

				○ ○ ○ ○
Epidermal cells	Sclerenchyma cells	Parenchyma cells	Mesophyll cells	

First Annual 2026 | Section B Q2(ix) OR | 3 marks

What are stem cells? Write about its types.	1+2

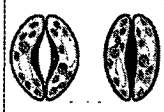
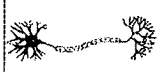
First Annual 2026 | Section B Q2(vi) OR | 3 marks

How is the concept of **emergent properties** as gain in functionality applied to going from subcellular organelles to tissues level?	03

First Annual 2026 | Section C Q3 | 6 marks

Q.3	Draw and label Endoplasmic reticulum, Golgi apparatus and Mitochondria. Also outline one role of each in a cell.	2+2 +2

First Annual 2026 | Section A Q5 | 1 mark

5.	Which cell is specialized for transmission of nerve impulses?	 Guard cell	 Neuron	 Root hair	 Amoeba
6.	During a research project, scientists from		Create	Improve	Limit

First Annual 2026 | Section B Q2(i) | 3 marks

Compare one structural advantage of epidermal cell in plants and red blood cell in animal that help each to perform its specific function.	1.5 +1.5

First Annual 2026 | Section B Q2(viii) OR | 3 marks

OR	How are mesophyll tissues important in a leaf due to their structure and function.	1.5 +1.5

First Annual 2026 | Section C Q5 | 6 marks

Draw and label nucleus. Explain the functions of different parts of nucleus.	2+4

FBISE model paper | Section A Q1(i) | 1 mark

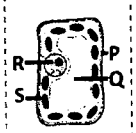
(i)	Which of the following organelle is NOT present in plant cell?	Centriole	Golgi body	Mitochondria	Ribosomes	○ ○ ○ ○

	place through xylem.	
OR	How cytokinesis takes place in plant cell?	03
OR	Three types of muscle cells are depicted in the following figure.  a. Correctly name the types of cells labeled as A, B and C. b. Mention the location of these cell types in the body.	1.5 + 1.5

FBISE model paper | Section C Q5 | 6 marks

Q.5	Describe structural advantages of any two animal and two plant cells.	1.5x 4

First Annual 2025 | Section A Q10 | 1 mark

10.	The organelle responsible for fluid storage in given plant cell is: دی گئی شکل میں کون سا حصہ پودوں کے خلیہ میں فلوئڈ(مائع)سٹور کرتا ہے؟		P	Q	R	S
	Which of the following is NOT a raw material				Carbon	

First Annual 2025 | Section B Q2(iii) | 3 marks

	Identify the cell organelles which are found both in animal and plant cells. ایسے سیل آرگنیلیز کی پہچان کریں جو جانوروں اور پودوں دونوں میں پائے جاتے ہیں۔	03

First Annual 2025 | Section B Q2(iv) | 3 marks

(iv)	Briefly explain types of mesophyll and their functions. میزوفل کی اقسام اور ان کے کام کی مختصر وضاحت کریں۔	03

ایسٹرو سفیرو میں اور ایکٹرو سفیرو میں پایا جاتا ہے؟

(xi) Complete the following table:

ٹیبل مکمل کریں:

Organelle آرگنیل	Structure ساخت	Function فعل
		Control the activities of cells خلیے کی سرگرمیوں کو کنٹرول کرنا
	Micro filament Micro tubules مائیکرو فلامنٹ، مائیکرو ٹیوبیولز	
Chloroplast کلوروپلاسٹ		

03

Sketch following sub-cellular organelles and outline their roles.		درج شدہ آرگنیلیز کے سکیچ بنائیں اور سیل میں ان کا کردار لکھیں۔		2.5 + 2.5	OR	Disc and leaf.
a.	Nucleus	الف۔ نیوکلیئس				a.
b.	Cell membrane	ب۔ سیل ممبرین				b.

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Cell cycle

Domain D: Cells and Subcellular Organelles

FBISE model paper | Section A Q17 | 0.5 marks

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.

FBISE model paper | Section A Q18 | 0.5 marks

18.	A student observes a cell where chromosomes are condensed and nuclear membrane is disappearing. This stage is:	Prophase	Metaphase	Anaphase	Telophase

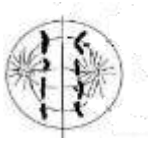
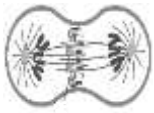
FBISE model paper | Section A Q19 | 0.5 marks

19.	Interphase is important because it:	Divides the cell	Ensures DNA replication	Disintegrates the nuclear membrane	Forms spindle apparatus

FBISE model paper | Section A Q20 | 0.5 marks

20.	In which of the following stage the cells may exit the cell cycle and stop to divide?	G1	G2	S	G0

FBISE model paper | Section A Q22 | 0.5 marks

22.	Which one of the following diagrams correctly represents anaphase-I?				

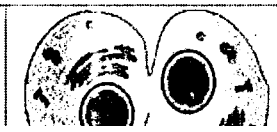
FBISE model paper | Section B Q5 OR | 3 marks

Enlist any two main events that occur during Prophase-I of meiosis and draw diagram.	2+1

FBISE model paper | Section B Q6 | 3 marks

6.	Compare anaphase-I of meiosis with anaphase of mitosis and draw labeled diagrams.	1.5 + 1.5

First Annual 2025 | Section B Q2(vi) | 3 marks

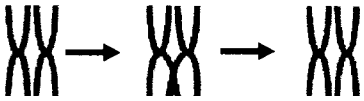
	ڈبل فرٹیلائزیشن سے کیا مراد ہے؟	03
(iii)	Draw a structural formula of an amino acid and label its four groups. امائینو ایسڈ کا ساختی فارمولا بنائیں اور اس کے چار گروپس کو لیبل کریں۔	1+2
(iv)	Differentiate between activator and co-enzyme with examples. مثالوں کے ساتھ ایکٹویٹر اور کو انزائم کے درمیان فرق کریں۔	03
(v)	Why are viruses considered to be at borderline between living and non–living organisms? وائرس کو جانداروں اور غیر جانداروں کے درمیان بارڈر لائن کیوں سمجھا جاتا ہے؟	03
(vi)	Identify the event of mitosis shown in figure and briefly explain it. 	1+2

First Annual 2025 | Section B Q2(vii) | 3 marks

(vii)	How does meiosis contribute in maintaining the number of chromosomes?	03

First Annual 2025 | Section C Q6 | 5 marks

Q.6	Draw and explain phases of karyokinesis of mitosis. مائی ٹوسز کے کیریوکائی نیسز کے مراحل کا خاکہ بنائیں اور وضاحت کریں۔	1+4	OR	Elaborate classification of carbohydrates on the basis of saccharide unit in the molecule.	2+2 +1

(iii)	Lipids contain double amount of energy than carbohydrates and proteins. Why? لپڈز میں کاربوہائیڈریٹس اور پروٹین سے دوگنا توانائی ہوتی ہے۔ کیوں؟	03
(iv)	What is meant by metabolism? Differentiate between catabolism and anabolism by examples. میٹابولزم سے کیا مراد ہے؟ کیٹابولزم اور اینابولزم کے درمیان مثالوں سے فرق واضح کریں۔	1+2
(v)	Compare domain archaea and eubacteria. (Any two points) ڈومین آرکیا اور یوبیکٹیریا کا موازنہ کریں۔ (کوئی سے تین نکات)	03
(vi)	Identify the event of meiosis shown in figure and briefly explain it. 	1+2

First Annual 2025 | Section C Q6 | 5 marks

Q.6	Draw cell cycle and explain its three major stages. سیل سائیکل بنائیں اور اس کے تین بڑے مراحل کی وضاحت کریں۔	**2+3**

Second Annual 2025 | Section B Q2(iv) | 3 marks

(iv)	Outline the significance of mitosis in regeneration. ری جنریشن میں مائی ٹوسس کی اہمیت مختصراً بیان کریں۔	**03**

Second Annual 2025 | Section C Q4 OR | 5 marks

	Compare mitosis and meiosis. (any five points) مائی ٹوسس اور می او سس کا موازنہ کریں۔(کوئی سے پانچ نکات)	05

First Annual 2026 | Section B Q2(ix) OR | 3 marks

	Write any three differences between meiosis and mitosis.	1x3

First Annual 2026 | Section B Q2(viii) OR | 3 marks

propagation? Explain briefly.	
How does mitosis play a role in asexual reproduction and cell replacement?	1.5 +1.5

First Annual 2026 | Section C Q3 OR | 6 marks

2+2 +2	OR	How does Meiosis I reduce the number of chromosomes to half? (Explain the stages of Meiosis I) Also draw the diagrams of Meiosis I.	4+2

First Annual 2026 | Section A Q5 | 1 mark

5. In G_1 phase of cell cycle:	Nucleotides are formed	DNA replicates	Cell exits cell cycle	Cell divides	○	○	○	○

First Annual 2026 | Section B Q2(viii) OR | 3 marks

Briefly explain the role of meiosis in maintaining chromosome number in animals and plants.	1.5 +1.5

First Annual 2026 | Section C Q3 OR | 6 marks

Q.3	Draw and label Endoplasmic reticulum, Golgi apparatus and Mitochondria. Also outline one role of each in a cell.	2+2 +2	OR	How does Karyokinesis occur in mitosis in a cell? Explain in detail. Also draw labelled diagram of the process.	4+2

First Annual 2026 | Section A Q10 | 1 mark

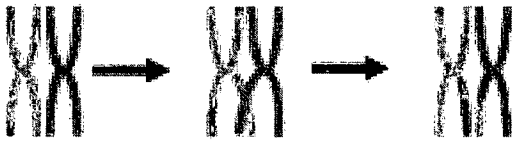
10. The longest phase of the cell cycle is usually:	M phase	G_2 phase	Interphase	S-phase

First Annual 2026 | Section B Q2(ii) OR | 3 marks

OR	Why is meiosis important for producing variation in organisms? Explain briefly.	03

First Annual 2026 | Section B Q2(iii) OR | 3 marks

OR	Write any three differences between prophase of mitosis and prophase I of meiosis.	1x3

OR	Identify the event of meiosis shown in figure and briefly explain it. 	03

First Annual 2026 | Section C Q5 OR | 6 marks

OR	How does cytokinesis differ in plants and animal cell? Explain. Also draw the diagrams of both.	3+3

FBISE model paper | Section A Q1(iii) | 1 mark

(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	○ ○ ○ ○

FBISE model paper | Section B Q2(viii) OR | 3 marks

	place through cytokinesis.	
OR	How cytokinesis takes place in plant cell?	03

FBISE model paper | Section C Q3 OR | 6 marks

Describe different steps of karyokinesis in mitosis with the help of diagrams.	6

First Annual 2025 | Section A Q5 | 1 mark

5.	Division of cytoplasm takes place in: سائٹوپلازم کی تقسیم کا عمل کس مرحلے میں ہوتا ہے؟	Karyokinesis کیریوکائینیسز	Prophase پروفیز	Cytokinesis سائٹوکائینیسز	Anaphase اینافیز

First Annual 2025 | Section B Q2(iv) OR | 3 marks

OR	Draw a neat labelled diagram of anaphase of mitosis. مائٹوسس Mitosis کے anaphase کا خاکہ بنائیں اور اسے لیبل کریں۔	03

First Annual 2025 | Section C Q3 OR | 5 marks

OR	What is interphase of cell cycle? Explain its phases. Also draw diagram. سیل سائیکل میں انٹرفیز کا مرحلہ کیا ہے؟ اس کے مراحل کی وضاحت کریں۔ نیز اگر ممکن ہو تو خاکہ بھی بنائیں۔	1+3 +1

Second Annual 2025 | Section B Q2(vi) | 3 marks

(vi)	A scientist observes a cell with chromosomes aligned at the equator. Identify the phase and write its importance. ایک سائنسدان نے ایک خلیہ دیکھا جس کے کروموسوم خطِ استوا (ایکویٹر) پر ترتیب میں ہیں۔	1+2

Second Annual 2025 | Section C Q3 OR | 5 marks

Describe the process of crossing over during meiosis. Make its diagram. Explains its significance in genetic variation.	2+1+2

First Annual 2026 | Section B Q2(v) OR | 3 marks

What is Mitosis? Enlist the phases of Mitosis (karyokinesis) in correct order. مائی ٹوسس کیا ہے؟ مائی ٹوسس (Karyokinesis) کے مراحل درست ترتیب میں لکھیں۔	1.5 + 1.5

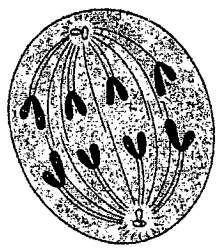
First Annual 2026 | Section B Q2(vi) | 3 marks

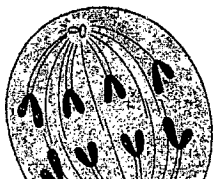
Identify phase of Meiosis-I and briefly describe it. می اوسس-I کے فیز کی پہچان کریں۔ اس کی مختصر		1+2

First Annual 2026 | Section C Q5 OR | 5 marks

Explain the biological significance of mitosis and meiosis in organisms. جانداروں میں مائٹوسس اور می او سس کی بائیولوجیکل اہمیت بیان کریں۔		2.5 + 2.5

First Annual 2026 | Section B Q2(v) OR | 3 marks

1.5 + 1.5	OR	Identify Phase of Mitosis and briefly describe. مائی ٹوسس کے فیز کی شناخت اور وضاحت کریں۔		1.5 + 1.5

Briefly describe 'synapsis' and 'crossing over' as the major events of Prophase-I. پروفیز -1 کے اہم مراحل سائی نیپسز اور کراسنگ اوور کی وضاحت کریں۔	1.5 + 1.5	OR	Identify Phase of Mitosis and briefly describe. مائی ٹوسس کے فیز کی شناخت اور وضاحت کریں۔		1.5 + 1.5

APOLLO

Tissues, organs& organ system

Domain E: Tissue, Organ and Systems

FBISE model paper | Section A Q23 | 0.5 marks

23.	Identify the structure/region that is involved in the regulation of temperature in the human body:	Lymph nodes	Pituitary gland	Kidney	Hypothalamus

FBISE model paper | Section A Q24 | 0.5 marks

24.	Homeostasis helps the body to:	Change rapidly with environment	Maintain stable internal environment	Control body growth and development	Stimulates digestive activity

FBISE model paper | Section A Q25 | 0.5 marks

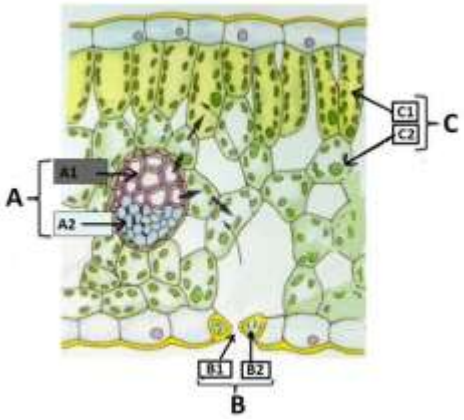
25.	Which of the following correctly matches the structure with its level of organization?	Root – Cell	Heart – Tissue	Muscle – Organ System	Brain – Organ

FBISE model paper | Section A Q27 | 0.5 marks

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

FBISE model paper | Section A Q28 | 0.5 marks

28.	Muscular tissue in the stomach is important for:	Producing enzymes	Mechanical digestion	Chemical digestion	Absorbing nutrients

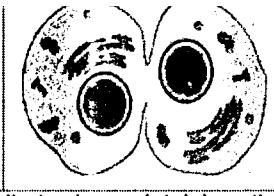
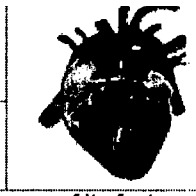
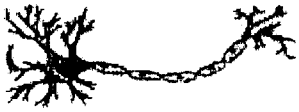
7.	Recall your knowledge about the tissues, organs and organ system in plants and animals to answer the following questions. (a) Mention the role of parts labelled as **A** (tissue), **B**(structure) and **C**(tissue) in plant leaf.  (b) How respiratory and urinary systems of the human body work to maintain homeostasis?	1+1+ 1 1.5+ 1.5

First Annual 2025 | Section A Q5 | 1 mark

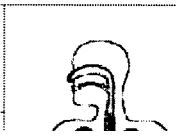
5.	Which system is involved in regulating blood glucose level?	Endocrine system	Skeletal system	Immune system	Nervous system

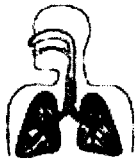
First Annual 2025 | Section B Q2(vi) OR | 3 marks

phylum. فائیلم کے ٹیکسان تک انسان کی درجہ بندی کا خاکہ بنائیں۔	03
How does comparative anatomy provide an evidence of evolution? تقابلی اناٹومی ارتقاء کا ثبوت کیسے فراہم کرتی ہے؟	03
Enlist any three sources of variations that lead to evolution. تغیرات کے کسی تین ذرائع کی نشاندہی کریں جو ارتقاء کی طرف لے جاتے ہیں۔	03
State any three structural advantages of a plant cell. پودوں کے سیل کے کوئی سے تین ساختی فوائد تحریر کریں۔	1x3
Identify the level of organization in given diagram and enlist any four examples of that level of organization. 	1+2

ntify the event of osis shown in figure d briefly explain it. شکل میں دکھائے گئے مائی ٹوسس کے واقعہ کی نشاندہی کریں اور مختصر وضاحت کریں۔ 	1+2	OR	Identify the level of organization in given diagram and enlist any four examples of that level of organization. دی گئی شکل میں تنظیم کی سطح کی شناخت کریں اور تنظیم کی اس سطح کی چار مثالیں دیں۔ 	1+2
w does meiosis contribute in maintaining the nber of chromosomes? متواتر نسلوں میں کروموسوم کی تعداد کو برقرار رکھنے میں می اوسس کیا کردار ادا کرتی ہے	03	OR	State TACT theory and enlist names of its factors. TACT تھیوری بیان کریں اور اس کے عوامل کے نام لکھیں۔	1+2
strate the importance of nitrogen in protein ıthesis. پروٹین کی تشکیل میں نائٹروجن کی اہمیت واضح کریں۔	03	OR	Write one role each of hormones, fibrinogen and keratin as proteins in the cells of human body. انسانی خلیوں میں ہارمونز، فائبرنوجن اور کیراٹن کا بطور پروٹین ایک ایک کردار لکھیں۔	03
w are transpiration and leaf surface area related? ٹرانسپائریشن اور پتے کی سطح کے رقبہ کا تعلق واضح کریں۔	03	OR	Why is ATP considered as energy currency of cell? اے ٹی پی سیل کو توانائی کی کرنسی کیوں کہا جاتا ہے؟	03
ntify the plant breeding technique in figure and efly explain it.  شکل میں پودوں کی افزائش کی تکنیک کی شناخت کریں اور اس کی مختصر وضاحت کریں۔	1+2	OR	Identify and briefly explain the level of organization in the given diagram.  دی گئی شکل میں تنظیم کی سطح کی شناخت اور مختصر وضاحت کریں۔	1+2
efly explain theory and law with examples			Briefly explain non-competitive inhibition of enzyme	

Q.4	Draw a cross-sectional view of leaf and highlight functions of epidermal, mesophyll and vascular tissues.	2+3

	فائیم کے ٹیلسان تک مٹر لی درجہ بندی کا خاکہ بنائیں۔	
OR	How does paleontology provide an evidence of evolution? پیلینٹولوجی ارتقاء کا ثبوت کیسے فراہم کرتی ہے؟	03
OR	State any three points of theory of evolution proposed by Darwin. ڈارون کے تجویز کردہ نظریہ ارتقاء کے کوئی سے تین نکات بیان کریں۔	1x3
OR	Draw a labelled fluid mosaic model of cell membrane. سیل کی جھلی کے فلوڈ موزیک ماڈل کا لیبل شدہ خاکہ بنائیں۔	03
OR	Identify level of organization in given sketch and enlist any four examples of that level of organization. 	1+2

OR	Identify level of organization in given sketch and enlist any four examples of that level of organization. دی گئی شکل میں تنظیم کی سطح کی شناخت کریں اور تنظیم کی اس سطح کی چار مثالیں دیں۔		1+2
OR	Briefly explain three types of transpiration in plants. پودوں میں تین قسم کی ٹرانسپائریشن کی مختصر وضاحت کریں۔		1x3
OR	Briefly explain types of RNA RNA کی تین اقسام کی مختصر وضاحت کریں۔		03
OR	Why is fermentation crucial process for living organisms? جانداروں کے لیے فرمینٹیشن کیوں اہم ہے؟		03
OR	Identify and briefly describe the level of organization in the given diagram.		1+2

First Annual 2025 | Section C Q4 | 5 marks

Q.4	Draw a cross-sectional view of human stomach and highlight functions of epithelial, connective and nervous tissues of stomach. انسانی معدے کا ایک کراس سیکشن بنائیں اور اس کی اپیتھیلیل، کنیکٹو اور نروس ٹشوز	2+3

Second Annual 2025 | Section B Q2(ix) OR | 3 marks

Distinguish between tissues and organs with examples. ٹشو اور آرگن میں فرق کریں اور مثالیں دیں۔	1.5+ 1.5

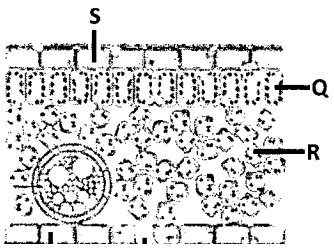
Second Annual 2025 | Section B Q2(v) | 3 marks

	Enlist three major tissues in human stomach with their roles. انسانی معدے کو تشکیل دینے والے تین ٹشوز کے نام اور کام لکھیں۔	03

First Annual 2026 | Section B Q2(v) OR | 3 marks

۲	Briefly explain the role of epithelial and connective tissues in stomach.	03

First Annual 2026 | Section B Q2(x) | 3 marks

(x)	Cross-section of a leaf is given. Identify: **a.** What is the role of part labelled as **P**? **b.** Differentiate between the function of **Q** and **R**. **c.** Label the parts **S** and **T**. 	1x3

First Annual 2026 | Section A Q6 | 1 mark

6. The main tissue in the stomach responsible for secretion of gastric juice is:	Epithelial	Nervous	Muscular	Connective	○ ○ ○ ○

First Annual 2026 | Section B Q2(v) OR | 3 marks

Name any three basic types of tissues found in the human stomach with their functions.	1x3

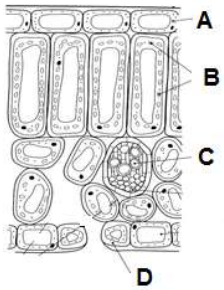
First Annual 2026 | Section B Q2(x) | 3 marks

Name any three main tissues found in a typical leaf and state one function of each.	1x3	OR

First Annual 2026 | Section B Q2(ix) OR | 3 marks

OR	Name any three tissues that are present in stomach. Give one function of each.	03

FBISE model paper | Section A Q1(v) | 1 mark

(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	○ ○ ○ ○
(vi)	Non-competitive inhibitors inactivate the enzyme. Identify non-competitive inhibitor in this figure.	A	B	C	D	○ ○ ○ ○

FBISE model paper | Section A Q1(vii) | 1 mark

(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

FBISE model paper | Section B Q2(vii) | 3 marks

(vii)	Why multiple organs are needed to develop an organ system?	3

FBISE model paper | Section C Q4 OR | 6 marks

Describe the internal structure of a typical leaf focusing on all tissue types found in it. Also draw its diagram.	5+1

First Annual 2026 | Section B Q2(vii) | 3 marks

Why is homeostasis important for survival of organisms?	03

First Annual 2026 | Section B Q2(vii) OR | 3 marks

Differentiate between tissue and organ with one example of each. ٹشو (Tissue) اور آرگن (Organ) میں فرق تحریر کریں اور ہر ایک کی ایک مثال دیں۔	1.5 + 1.5

First Annual 2026 | Section C Q4 OR | 5 marks

Sketch following sub-cellular organelles and outline their roles.		درج شدہ آرگنیلیز کے سکیچ بنائیں اور سیل میں ان کا کردار لکھیں۔		2.5 + 2.5	OR	Discuss the importance and role of following in a leaf.		پتے میں درج ساختوں کی اہمیت اور کردار واضح کریں۔	3+2
a.	Nucleus	الف۔	نیوکلیئس			a.	Epidermis	الف۔	اپی ڈرمس
b.	Cell membrane	ب۔	سیل ممبرین			b.	Mesophyll	ب۔	میزوفل

APOLLO

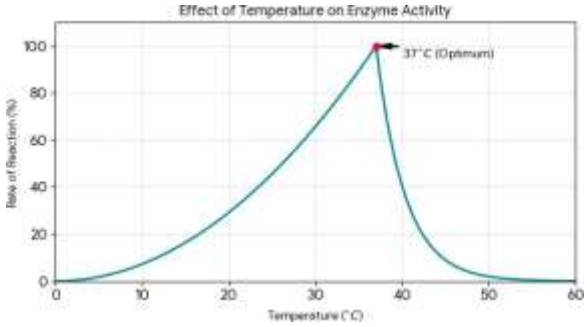
Metabolism

Domain F: Metabolism

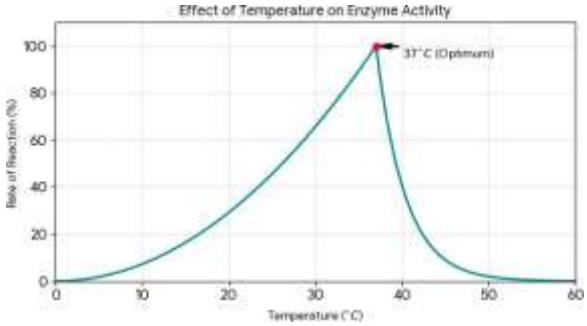
FBISE model paper | Section A Q36 | 0.5 marks

36.	In which of the following processes ATP is used as an energy currency?	Osmosis	Active transport	Diffusion	Facilitated diffusion

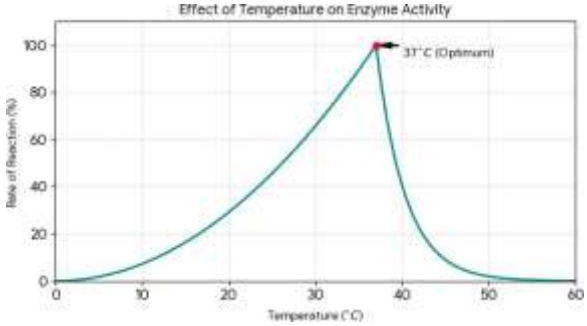
FBISE model paper | Section A Q41 | 0.5 marks

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

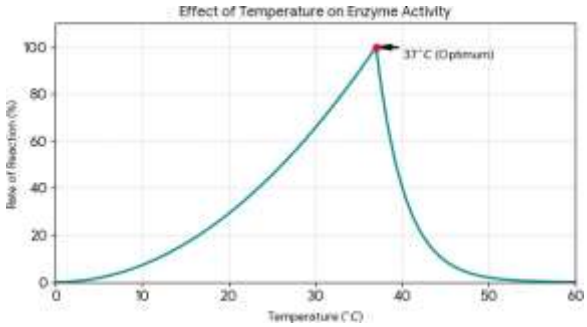
FBISE model paper | Section A Q42 | 0.5 marks

Scenario for MCQ# 41 to 44	**Enzyme activity increases with temperature, reaches a peak at 37°C, and then sharply declines.** 				
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

FBISE model paper | Section A Q43 | 0.5 marks

Scenario for MCQ# 41 to 44	**Enzyme activity increases with temperature, reaches a peak at 37°C, and then sharply declines.** 				
43	The sharp decline after peak is due to:	Increased enzyme activity	Denaturation of enzyme	More ATP production	More substrate

FBISE model paper | Section A Q44 | 0.5 marks

Scenario for MCQ# 41 to 44	**Enzyme activity increases with temperature, reaches a peak at 37°C, and then sharply declines.** 				
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

FBISE model paper | Section A Q49 | 0.5 marks

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

FBISE model paper | Section A Q50 | 0.5 marks

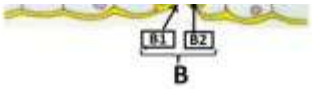
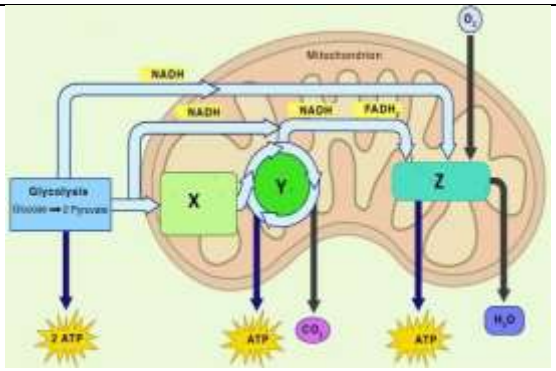
Scenario for MCQ# 49 to 52	**Two cells are observed under different conditions of respiration:** • **Cell A: High oxygen, high ATP, no lactic acid** • **Cell B: Low oxygen, low ATP, lactic acid present**				
50.	Cell **B** is most likely found in:	Resting muscle cell	Active exercising muscle	Mesophyll cells in plants	Bone cell

FBISE model paper | Section A Q51 | 0.5 marks

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**			
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

FBISE model paper | Section A Q52 | 0.5 marks

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**			
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

	 (b) How respiratory and urinary systems of the human body work to maintain homeostasis?	1.5+ 1.5
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

First Annual 2025 | Section A Q8 | 1 mark

8.	NADH releases _____ when it passes through electron transport chain. NADH الیکٹران ٹرانسپورٹ چین سے گزرنے پر _____ بناتا ہے۔	2 ATP molecules ATP 2 مالیکیولز	3 ATP molecules ATP 3 مالیکیولز	20 ATP molecules ATP 20 مالیکیولز	36 ATP molecules ATP 36 مالیکیولز

First Annual 2025 | Section A Q9 | 1 mark

9.	Light dependent reactions of photosynthesis occur in which part of cell?	Thylakoid membrane	Stroma	Grana	Cytoplasm

First Annual 2025 | Section B Q2(iv) | 3 marks

(iv)	Differentiate between activator and co-enzyme with examples.	03

First Annual 2025 | Section B Q2(ix) OR | 3 marks

OR	Why is ATP considered as energy currency of cell? اے ٹی پی سیل کو توانائی کی کرنسی کیوں کہا جاتا ہے؟	03

First Annual 2025 | Section B Q2(xi) OR | 3 marks

1.5 + 1.5	OR	Briefly explain non-competitive inhibition of enzyme. ایک انزائم کی غیر مسابقتی روک تھام کی مختصر وضاحت کریں۔

First Annual 2025 | Section C Q4 OR | 5 marks

OR	What is aerobic Respiration? Explain its four steps. ایروبک ریسپائریشن کیا ہے؟ اس کے چار مراحل کی وضاحت کریں۔	1+4

First Annual 2025 | Section A Q8 | 1 mark

8.	$FADH_2$ releases _____ when it passes through electron transport chain.	2 ATP molecules	3 ATP molecules	20 ATP molecules	36 ATP molecules

First Annual 2025 | Section A Q9 | 1 mark

9.	Which step of aerobic respiration uses oxygen as final acceptor to produce water?	Glycolysis	Krebs cycle	Formation of acetyl CO-A	Electron transport chain

First Annual 2025 | Section B Q2(iv) | 3 marks

(iv)	What is meant by metabolism? Differentiate between catabolism and anabolism by examples.	1+2

First Annual 2025 | Section B Q2(ix) OR | 3 marks

OR	Why is fermentation crucial process for living organisms?	03

First Annual 2025 | Section B Q2(xi) OR | 3 marks

OR	Briefly explain competitive inhibition of enzyme. ایک انزائم کی مسابقتی روک تھام کی مختصر وضاحت کریں۔	03

First Annual 2025 | Section C Q3 | 5 marks

Q.3	Explain three major steps of Calvin cycle and draw its labeled sketch.	3+2

Second Annual 2025 | Section B Q2(ii) OR | 3 marks

Illustrate any three points of comparison between competitive and non-competitive inhibition.

Second Annual 2025 | Section B Q2(v) OR | 3 marks

What is meant by compensation point of photosynthesis? 03

فوٹو سینتھی سیز کے کمپین سیشن پوائنٹ سے کیا مراد ہے؟

Second Annual 2025 | Section B Q2(vi) | 3 marks

)	Discuss the role of ATP as energy currency in living organisms. (any three points) زندہ اجسام میں توانائی کی کرنسی کے طور پر اے ٹی پی کا کردار بیان کریں۔ (تین نکات)	03

Second Annual 2025 | Section B Q2(xi) | 3 marks

(xi)	Briefly explain Kreb's cycle. کریب سائیکل کی مختصر وضاحت کریں۔	03

Second Annual 2025 | Section C Q5 | 5 marks

Q.5	Explain characteristics of enzymes. (Any five) انزائمز کی خصوصیات کی وضاحت کریں۔(کوئی سی پانچ)	**05**

First Annual 2026 | Section B Q2(viii) | 3 marks

	justify.	
viii)	How does a non-competitive inhibitor affect enzyme activity?	**03**

4.4	Differentiate between types of anaerobic respiration. Highlight the significance of anaerobic respiration as well.	4+2

First Annual 2026 | Section C Q5 OR | 6 marks

Q.5	How is the scientific method used to solve a biological problem? Explain all steps in correct sequence with brief explanation of each involved in scientific method.	06	OR	Describe the types of cofactors of enzymes. How enzymes affect energy of activation? Explain. Draw graph as well.

First Annual 2026 | Section A Q7 | 1 mark

An enzyme is best described as a/an:	Lipid molecule	Hormone	Energy source	Biological catalyst	○ ○ ○ ○

(viii)	What is competitive inhibition in enzyme action? Explain briefly.	1+2	OR