APOLLO

FBISE Biology Class 11
Topical workbook - Volume 3 of 4

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

APOLLO

Reproduction

Domain H: Reproduction and Inheritance

	protect body from infections.	
(ix)	Draw a flow chart showing hormonal control of male reproductive system.	03

APOLLO

Inheritance

Domain H: Reproduction and Inheritance

FBISE model paper | Section A Q12 | 0.5 marks

12.	Traits which exhibit continuous phenotypic variation are typically determined by which of the following inheritance form:	Incomplete dominance	Polygenic inheritance	Multiple-allelic inheritance	Sex-linked inheritance

FBISE model paper | Section A Q13 | 0.5 marks

13.	When two yellow *Labrador retriever* cross with each other, what is the probability that they produce yellow offsprings:	Zero %	25%	50%	100%

FBISE model paper | Section A Q55 | 0.5 marks

55.	A gene codes for:	Lipid synthesis	Polypeptide formation	ATP production	Glucose synthesis

FBISE model paper | Section A Q56 | 0.5 marks

56.	A cross between two heterozygous pink flowers 4 O"clock plants result in phenotypic ratio:	3:1	1:1	2:1	1:2:1

FBISE model paper | Section A Q73 | 0.5 marks

Scenario for MCQ# 73 to 76		**During a genetic counselling session in a college, students asked questions about how the sex of the babies is determined. The counsellor explained to the students that the mother has two X chromosomes (XX), while the father has one X and one Y chromosome (XY).**			
73.	The sex of the child is determined by:	Mother only	Father only	Both equally	Environment

FBISE model paper | Section A Q74 | 0.5 marks

Scenario for MCQ# 73 to 76		**During a genetic counselling session in a college, students asked questions about how the sex of the babies is determined. The counsellor explained to the students that the mother has two X chromosomes (XX), while the father has one X and one Y chromosome (XY).**			
74.	If sperm carries X chromosome fertilizes the normal egg, the child will be:	Intersex	Male	Sterile	Female

FBISE model paper | Section A Q75 | 0.5 marks

Scenario for MCQ# 73 to 76		**During a genetic counselling session in a college, students asked questions about how the sex of the babies is determined. The counsellor explained to the students that the mother has two X chromosomes (XX), while the father has one X and one Y chromosome (XY).**			
75.	Probability of male childbirth in each pregnancy is :	25%	50%	75%	100%

FBISE model paper | Section C Q9 OR | 6 marks

3+3	OR	Explain recessive epistasis in animals with example. Sketch its genetic cross to show the deviation from standard Mendelian ratio.	3+3

First Annual 2025 | Section A Q13 | 1 mark

13.	The sex linked traits which are more common in males than female are:	Autosomal recessive	Y– linked dominant	X– linked dominant	X– linked recessive

First Annual 2025 | Section A Q16 | 1 mark

16.	Identify the trait which is **NOT** controlled by polygenes?	Intelligence	Height	Skin color	Tongue rolling

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

OR	What is incomplete dominance? Explain with a suitable example.	**1+2**

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

(ix)	What is Y– linked inheritance? How these traits are transmitted? Also give two examples.	**1x3**

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

OR	Coat color in *Labrador retriever* shows epistasis. If a black(BbEe) and a chocolate (bbEe) *Labradors retrievers* are crossed: **a.** Show genotypes and phenotypes of offspring(s). **b.** Calculate the probability of black and yellow coat color.	**2+1**

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

OR	Name the type of pattern of sex determination in humans. Also write mechanism of sex determination in man.	**1+2**

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

(x)	Justify that O $^{-ve}$ persons are universal donors and AB $^{+ve}$ are universal recipients of blood.	**03**

First Annual 2025 | Section C Q5 | 6 marks

	Also draw labelled Nitrogen cycle flow sheet.	
Q.5	Epistasis is different from dominance. Explain with the example of coat color in *Labrador retriever*.	**06**

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

(ix)	Briefly explain any three prokaryotic features of cyanobacteria.	1x3	OR	Differentiate between incomplete dominance and codominance.	1.5 + 1.5

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

(vi)	Briefly explain three steps of oxidation of pyruvate into acetyl Co-A.	1x3	OR	Equisetum Why are the chances of a husband and wife having either a boy or a girl 50:50?	03

Second Annual 2025 | Section C Q6 | 6 marks

Q.6	Explain inheritance of wheat grain colour. Make a suitable checker board as an example of Polygenic inheritance.	**3+3**	**OR**

First Annual 2026 | Section A Q13 | 1 mark

Polygenic inheritance results in:	Single trait expression	Continuous variation	Dominant traits only	Mutation only	◯	◯	◯	◯

First Annual 2026 | Section A Q14 | 1 mark

14. Epistasis modifies:	DNA	Genetrix ratio	Phenotypic ratio	Protein	◯	◯	◯	◯

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

	Explain through a cross that incomplete dominance is a deviation from Mendal's law of segregation.	03
	State three characteristics which are common in	

First Annual 2026 | Section C Q6(ab) OR | 6 marks

OR	**a.** Explain genetics of hemophilia with reference to pattern of inheritance. **b.** Can two normal parents have a hemophilic child? Work out the probability.	3+3

First Annual 2026 | Section A Q13 | 1 mark

Polygenic inheritance results in:	Discrete variation	Mutation only	No variation	Continuous variation

First Annual 2026 | Section A Q14 | 1 mark

14.	In Labrador retrievers, coat colour inheritance is an example of:	Incomplete dominance	Codominance	Mutation	Epistasis

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

When Red 4'O clock flower is crossed with white flower, what is the probability of red, white and pink flowers?	03

First Annual 2026 | Section C Q6 | 6 marks

Q.6	a.	Explain genetics of colour-blindness with reference to pattern of inheritance.	3+3
	b.	Can two normal parents have a colourblind child? Work out the probability.	

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

(xiii)	Traits which exhibit continuous phenotypic variation are typically determined by this inheritance form:	Incomplete dominance	Polygenic inheritance	Multiple-allele inheritance	Sex-linked inheritance

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

(xiv)	When two golden *Labrador retriever* cross with each other, they produce golden offsprings:	Zero %	25%	50%	100%

Two pink flowered four o’ clock plants are crossed with each other. What is F1 generation probability and ratio?	3

Q.6	How X- linked recessive characters are inherited in humans? Explain with an example.	2+4

Second Annual 2025 | Section A Q13 | 1 mark

	of male secondary sexual characteristics?			Estrogen	FSH
13.	Which blood group results from the presence of both I^A and I^B alleles?	A	B	O	AB

Second Annual 2025 | Section A Q14 | 1 mark

14.	Which genetic cross illustrates incomplete dominance?	Red flower × White flower → Pink flower	Red flower × White flower → All red	Tall pea plant × Dwarf pea plant → All tall	Yellow seed × Green seed → All yellow
	The semi-conservative model of DNA				

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

(x)	Explain Sex determination in human by Punnett square.	03

Q.6	Explain epistasis with reference to inheritance of coat colour in labrador retriever.	06

APOLLO

Chromosome and DNA

Domain H: Reproduction and Inheritance

FBISE model paper | Section A Q16 | 0.5 marks

16.	If you want to label amino acids but not DNA, which of the following radioactive isotopes would you use?	^{18}F	^{35}S	^{14}C	^{32}P

FBISE model paper | Section A Q61 | 0.5 marks

Scenario for MCQ# 61 to 64	**A group of biology students is studying classic experiments that led to the discovery of genetic material. Their teacher presents experimental setup:** **1. In the first experiment by Fredrick Griffith, harmless (non-virulent) *Streptococcus pneumoniae* bacteria are mixed with heat-killed virulent bacteria and injected into healthy mice. Surprisingly, the mice die, and live virulent bacteria are recovered from their bodies.** **2. Findings of the above experiments were later confirmed by another group of scientists.** **Students are asked to interpret the results of these experiments.**				
61.	The observation that mice died after injection of heat-killed virulent bacteria mixed with non-virulent bacteria indicates that:	Heat-killed bacteria became alive again	Some factor from dead bacteria transformed the non-virulent bacteria	Non-virulent bacteria were naturally pathogenic	Mice were already infected before experiment

FBISE model paper | Section A Q62 | 0.5 marks

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62.	Which material was confirmed in later experiments that converted the non-virulent bacteria into virulent in Griffith‟s experiment?	Protein	Lipid	DNA	RNA

FBISE model paper | Section A Q63 | 0.5 marks

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63.	Which process converts the non-virulent bacteria into virulent form in the above experiment?	Conjugation	Transduction	Transformation	Binary fission

FBISE model paper | Section A Q64 | 0.5 marks

Scenario for MCQ# 61 to 64	**A group of biology students is studying classic experiments that led to the discovery of genetic material. Their teacher presents experimental setup:** **1. In the first experiment by Fredrick Griffith, harmless (non-virulent) *Streptococcus pneumoniae* bacteria are mixed with heat-killed virulent bacteria and injected into healthy mice. Surprisingly, the mice die, and live virulent bacteria are recovered from their bodies.** **2. Findings of the above experiments were later confirmed by another group of scientists.** **Students are asked to interpret the results of these experiments.**				
64.	Which conclusion is best supported by given experiment?	Proteins carry hereditary information in bacteria	DNA is the genetic material responsible for inheritance	Lipids control bacterial transformation	RNA is the only hereditary material in all organisms

FBISE model paper | Section A Q76 | 0.5 marks

Scenario for MCQ# 73 to 76	**During a genetic counselling session in a college, students asked questions about how the sex of the babies is determined. The counsellor explained to the students that the mother has two X chromosomes (XX), while the father has one X and one Y chromosome (XY).**				
76.	Which combination of chromosomes produces a child with Klinefelter‟s syndromes?	XXY	XXX	XYY	XO

FBISE model paper | Section C Q9 | 6 marks

9.	Explain the process of initiation phase of Transcription in Prokaryotes and Eukaryotes. Illustrate your answer with relevant diagrams.	3+3	OR	Explain animals genetic c from star

First Annual 2025 | Section A Q4 | 1 mark

When RNA polymerase binds to promoter for transcription, the unit which detaches form it is:	α (Alpha)	β (Beta)	γ (Gamma)	θ (Theta)

First Annual 2025 | Section A Q9 | 1 mark

The condition in which centromere of a chromosome is located slightly away from the center is termed as:	Acrocentric	Sub metacentric	Telocentric	Metacentric

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

OR	What is point mutation? How it causes sickle cell anaemia?	**1+2**

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

	tube 2, 3 and 4.	
OR	Name any three enzymes with their functions involved in DNA replication.	**03**

First Annual 2025 | Section C Q4 | 7 marks

	cycle.	
Q.4	Explain translation process starting from initiation complex till termination. Also draw diagram of initiation complex and elongation steps.	**2+2 + 1+2**
Q.5	Describe the pathways involved in moving signals	

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

OR	Why post–transcriptional modifications occur in eukaryotic mRNA? Summarize the changes which occur during mRNA processing.	**1+2**
	Write any three distinguishing characteristics of	

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

OR	Name the types of chromosomes on the basis of position of centromere mentioning its location in each type. (Any three)	**03**
	How evolution of Giraffe neck can be explained	

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

(xiv)	Write down the sources of mutagens with their examples. (Any three)	**03**

First Annual 2025 | Section C Q3 | 7 marks

Q.3	Explain Meselson–Stahl experiment and results to prove that DNA replication is semi conservative. Also draw the diagram.	**3+2 +2**

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

	unfavourable conditions.				
(xii)	Describe genomic organization of bacteria with respect to circular DNA and plasmids.	**1.5 + 1.5**	**OR**	Why post transcriptional modification of mRNA is necessary for eukaryotes? Give at least three reasons.	**1x3**
(xiii)	Write down names and causative agents of any			Briefly describe	

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

(xiv)	Describe any three general features of vascular plants.	**1x3**	**OR**	Briefly state three sources of mutation with examples.	**03**

Second Annual 2025 | Section C Q5 OR | 6 marks

				lysogenic cycle.	
Q.5	Explain components of TACT force and its on mechanism.	**4+2**	**OR**	Explain four steps of Griffith experiment and conclusions to prove DNA hereditary material.	**4+2**

First Annual 2026 | Section A Q17 | 1 mark

17.	Griffith and Hershey-Chase experiments proved that:	Proteins are hereditary material	DNA is hereditary material	RNA is genetic material	Lipids carry genes	○	○	○	○

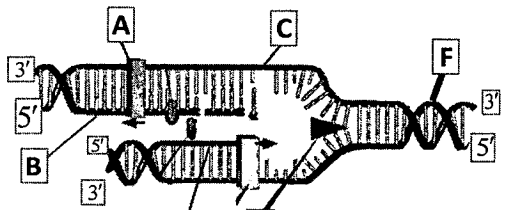
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First Annual 2026 | Section B Q2(iii) OR | 3 marks

	State three conclusions of Griffith control experiments.	1x3

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

OR	Describe three steps of Polypeptide elongation during protein synthesis.	1x3

OR	Identify parts A – F in DNA replication process and briefly explain each part.  	3+3

First Annual 2026 | Section C Q4 | 6 marks

Explain the double helical structure of DNA as proposed by Watson and Crick. Also draw diagram.	4+2
Describe the structure and function of	

First Annual 2026 | Section A Q17 | 1 mark

According to Griffith and Hershy – Chase genetic material proved to be:	DNA	Protein	RNA	Lipid

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

OR	What were the findings of Hershey-Chase experiment? Write briefly.	**1x3**

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

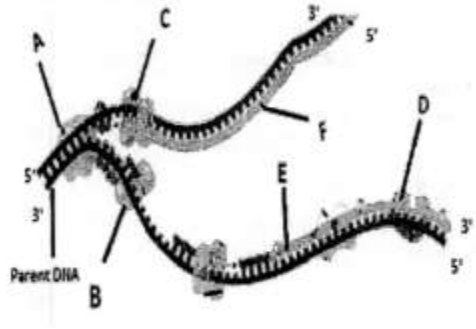
OR	Describe three stages of formation of initiation complex during translation process.	**1x3**

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

Why mice were killed by non-virulent type R bacteria in last step of Griffith's experiment?	3

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

Carefully observe the following stretch of antisense strand of DNA 5' 3' TACGAGCTTCCGATTCGA Codons for amino acids are: GCU : Alanine, AUG : Methionine, CUC : Leucine, GAA : Glutamate, GGC : Glycine , UAA : Stop Using the provided data, determine the primary structure of protein produced from this segment of DNA, during translation.	3

Q.3	Explain the structure and composition of fluid mosaic model of plasma membrane with diagram	4+2	**OR**	The given figure shows the process of DNA replication.  Identify labelled parts A, B, C, D, E and F of the diagram and write the functions of A, B and C in the process of DNA replication.	3+3

2.	Which one of the following defines polysomes?	Lysosomal aggregation on Golgi bodies	Multiple units of ribosomes assembled on ER	Attachment of many mRNA to ribosomes	Attachment of many ribosomes to a common mRNA	○ ○ ○ ○

Second Annual 2025 | Section A Q15 | 1 mark

		flower		plant → All tall	All yellov
15.	The semi-conservative model of DNA replication was experimentally proven by:	Watson and Crick	Hershey and Chase	Meselson and Stahl	Griffith
	The presence of wings in bats and insects				

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

	'chlorophyll b'?	
OR	Why did Hershey and Chase label one batch of bacteriophages with ^{32}P and other batch with ^{35}S ? How did this help them to conclude that DNA is genetic material?	1.5 + 1.5
	Write down roles of reverse transcriptase, integrase	

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

OR	Why promotor region is required for transcription? How this region is different in Prokaryotes and Eukaryotes?	1+2
	Write any three characteristics of angiosperms	

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

(xi)	What is meant by degeneracy of genetic code.	03

First Annual 2026 | Section C Q3 OR | 7 marks

2+3 +2	OR	Explain Meselson Stahl model of semi conservation Model of replication.	07

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

(xiii)	What is splicing? Why is it important?	1+2

APOLLO

Ecology

Domain N: Ecology

FBISE model paper | Section A Q9 | 0.5 marks

9.	The function of saprotrophs in an ecosystem is to:	Provide oxygen to producers	Decrease competition among consumers	Increase complexity of food chain	Return nutrients to the environment

FBISE model paper | Section A Q69 | 0.5 marks

Scenario for MCQ# 69 to 72	**A rapidly industrializing city has reported a steady rise in average annual temperature over the past decade. Environmental scientists attribute this trend to increased emissions of gases such as carbon dioxide, methane and sulfur dioxide from factories, vehicles, and urban activities. These gases accumulate in the atmosphere and cause air pollution**				
69.	The increase in air temperature is mainly due to:	Oxygen	Carbon dioxide	Nitrogen	Sulfur dioxide

FBISE model paper | Section A Q70 | 0.5 marks

Scenario for MCQ# 69 to 72	**A rapidly industrializing city has reported a steady rise in average annual temperature over the past decade. Environmental scientists attribute this trend to increased emissions of gases such as carbon dioxide, methane and sulfur dioxide from factories, vehicles, and urban activities. These gases accumulate in the atmosphere and cause air pollution**				
70.	Greenhouse gases cause warming by:	Reflecting sunlight	Breaking ozone	Producing oxygen	Absorbing infrared radiation

FBISE model paper | Section A Q71 | 0.5 marks

Scenario for MCQ# 69 to 72	**A rapidly industrializing city has reported a steady rise in average annual temperature over the past decade. Environmental scientists attribute this trend to increased emissions of gases such as carbon dioxide, methane and sulfur dioxide from factories, vehicles, and urban activities. These gases accumulate in the atmosphere and cause air pollution**				
71.	Supposed that level of all greenhouse gases become extremely low, what will be the possible consequence?	Earth will become over cooled	Earth will attain stable climate	Earth will become over heated	Increased trapping of infrared radiations

FBISE model paper | Section A Q72 | 0.5 marks

Scenario for MCQ# 69 to 72	**A rapidly industrializing city has reported a steady rise in average annual temperature over the past decade. Environmental scientists attribute this trend to increased emissions of gases such as carbon dioxide, methane and sulfur dioxide from factories, vehicles, and urban activities. These gases accumulate in the atmosphere and cause air pollution**				
72.	Increased greenhouse effect may lead to:	Cooling of Earth	Stable climate	Ocean acidification	Reduced radiation

FBISE model paper | Section B Q4 OR | 4 marks

1+1+1+1	OR	State the two steps involved in nitrification (a phase of nitrogen cycle) along with the specific bacteria responsible for each step.	2+2

First Annual 2025 | Section A Q1 | 1 mark

When energy flows from one trophic level to the next, the amount of energy lost is about:	10%	50%	90%	100%

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

(viii)	Write about de-nitrification and assimilation processes in nitrogen cycle.	**1.5 + 1.5**

First Annual 2025 | Section C Q3 OR | 7 marks

OR	Explain different stages of xerarch succession on bare rock starting form lichens to flowering plants.	**07**

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

OR	Name any three main greenhouse gases and their sources of emission.	**03**

First Annual 2025 | Section C Q4 | 7 marks

Q.4	Describe Nitrogen Fixation, Ammonification and Nitrification stages involved in Nitrogen cycle. Also draw labelled Nitrogen cycle flow sheet.	**5+2**
Q.5	Epistasis is different from dominance. Explain with	

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

				reasons.	
(xiii)	Write down names and causative agents of any three fungal diseases in man.	**1x3**	**OR**	Briefly describe population, community and ecosystem.	**1x3**

Second Annual 2025 | Section C Q6 OR | 6 marks

Q.6	Explain inheritance of wheat grain colour. Make a suitable checker board as an example of Polygenic inheritance.	**3+3**	**OR**	What is greenhouse effect? Explain any five impacts of greenhouse gases on climate change.	**1+5**

First Annual 2026 | Section A Q10 | 1 mark

Holozoic nutrition is found in:	Plants	Fungi	Bacteria	Animals	◯	◯	◯	◯

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

Explain three ways of nitrogen fixation.	1x3

First Annual 2026 | Section C Q4 OR | 6 marks

OR	Explain kinds and general stages of succession.	3+3

First Annual 2026 | Section A Q10 | 1 mark

Organisms that obtain food from dead organic matter are:	Autotrophs	Parasites	Saprophytes	Predators

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

OR	Describe three differences between saprotrophic and parasitic nutrition.	**1x3**

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

OR	State the events of nitrification in nitrogen cycle.	**03**

First Annual 2026 | Section C Q4 OR | 6 marks

Describe xerarch succession on bare rock from lichens to flowering plants.	1x6

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

(x)	The function of saprotrophs in an ecosystem is to:	Provide oxygen to producers	Return nutrients to the environment	Increase complexity of food chain	Decrease competition among consumers

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

Can nitrogen cycle take place in a bacteria free soil? Give reasons.	3

FBISE model paper | Section C Q4 OR | 6 marks

Q.4	The two strands of DNA are not identical but are complementary. Give	1+5	**OR**	What is ecological succession? Explain the xerarch succession.	1+4+1

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

OR	Explain nitrification step of nitrogen cycle.	

First Annual 2026 | Section C Q4 OR | 7 marks

OR	Explain in detail Xerarch succession on a bare rock.	5+2

APOLLO

Prokaryotes

Domain O: Prokaryotes, Protists and Fungi

FBISE model paper | Section A Q5 | 0.5 marks

5.	We have one billion bacteria per square centimetre of our skin. Why we have so many bacteria on our skin?	To produce acne, eczema and pimples on the skin	To limit the growth of pathogens by colonization resistance	To provide essential minerals and nutrients to the body	To help in decomposition after the death of a person

FBISE model paper | Section A Q23 | 0.5 marks

23.	Binary fission in bacteria results in:	Identical daughter cells	Genetic recombination	Genetically different daughter cells	Spore formation only

FBISE model paper | Section B Q2 OR | 4 marks

OR	State any four physical methods used to control harmful bacteria.	1+1+1+1

First Annual 2025 | Section A Q14 | 1 mark

14.	The organism having Chlorophyll – a, Phycocyanin and Heterocyst may be a/an:	Bacterium	Cyanobacterium	Fungus

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

OR	Enlist any three physical methods used to control bacteria with their mechanisms.	**03**

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

OR	Endospore formation is a mechanism in bacteria to survive under unfavorable conditions. Justify.	**03**

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

OR	Name and briefly explain Growth Phases of bacteria. (Any three)	**03**

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

OR	Write any three chemical methods with their mechanisms used to control bacteria.	**1x3**

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

OR	How is photosynthesis in Cyanobacteria different from Bacteria? (any three differences)	**03**

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

				cell.	
(ii)	Compare amylase starch with amylopectin on the basis of structures, linkage and solubility.	**1x3**	**OR**	Briefly describe the composition and role of 'capsule' in bacterial cell.	**2+1**

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

(ix)	Briefly explain any three prokaryotic features of cyanobacteria.	1x3	OR

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

(x)	Illustrate with diagrams three types of rod shape bacteria.	1x3	OR

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

(xi)	Enlist any six stages of endospore formation in bacteria as a mechanism of survival to withstand unfavourable conditions.	03	OR	Classify animals on the basis of Body cavity with one example of each.	1x3
(xii)	Describe genomic organization of bacteria with				

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

	unfavourable conditions.				
(xii)	Describe genomic organization of bacteria with respect to circular DNA and plasmids.	1.5 + 1.5	OR	Why post transcriptional modification of mRNA is necessary for eukaryotes? Give at least three reasons.	1x3
(xiii)	Write down names and				

First Annual 2026 | Section A Q6 | 1 mark

Which vitamin is commonly produced by intestinal bacteria?	Vitamin A	Vitamin C	Vitamin K	Vitamin D	◯	◯	◯	◯
Which bacteria								

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

	Compare photosynthetic bacteria and chemosynthetic bacteria. (Three points)	1x3

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

OR	Briefly explain three physical methods to control bacteria.	1x3

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

OR	Enlist three advantages of endospore formation.	1x3

First Annual 2026 | Section A Q6 | 1 mark

Gut bacteria helps in the synthesis of:	Vitamin K	Proteins	Lipids	DNA

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

OR	Briefly explain three chemical methods to control bacteria.	1x3

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

viii)	Enlist six stages of endospore formation.	03

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

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

S #	Question	(A)	(B)	(C)	(D)	(A)	(B)	(C)	(D)
(i)	A certain poison disrupts the cytoskeleton of cell. Which of the following functions would be affected most probably by the poison?	Digestion within lysosomes	Protein synthesis	Cell division	Cellular respiration	○	○	○	○
(ii)	Identify hetero polysaccharide from the following:	Chitin	Glycogen	Pectin	Cellulose	○	○	○	○
(iii)	Glycolysis is a process that:	Produces ATP and NADH	Produces ATP only	Is not a net producer of energy rich molecules	Consumes as much ATPs as is produced	○	○	○	○
(iv)	What will happen to reaction if activation energy is decreased?	Rate of reaction decreases	Rate of reaction increases	No effect on the rate of reaction	Reaction is reversed	○	○	○	○
(v)	One of the following viruses have complex capsid:	Influenza virus	Adenovirus	Bacteriophage	Tobacco mosaic virus	○	○	○	○
(vi)	We have 1 billion bacteria per square centimetre of our skin. Why we have so many bacteria on our skin?	To produce acne, eczema and pimples on the skin	To limit the growth of pathogens by colonization resistance	To provide essential minerals and nutrients to the body	To help in decomposition after the death of a person	○	○	○	○

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

How chemosynthetic bacteria are autotrophic in nature?	3

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

Name three chemical methods and three physical methods used to control harmful bacteria.	0.5x6

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

(viii)	Why spore forming bacteria are more virulent and lethal? Give reasons.	3

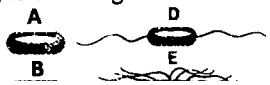
First Annual 2025 | Section A Q9 | 1 mark

8.	oro-fecal route?	Hepatitis A & B	Hepatitis B & C	Hepatitis A & E	Hepatitis C & D	○	○	○	○
9.	Pick the correct statement about the mesosome of bacterial cell.	Invagination of cell membrane involved with cell division	Exospore which protect a bacterial cell from dessication	Outer layer of cell wall help bacteria in variability	Invagination of cell membrane involved with pathogenicity	○	○	○	○

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

Differentiate between bacteria and cyanobacteria in terms of their photosynthetic properties.	03

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

(iv)	Why pepsinogen is secreted by stomach cells in inactive form? How it is activated then?	03
(v)	How chemiosmosis is done in chloroplast?	03
(vi)	Is virus living or non-living? Justify your answer with reason.	03
(vii)	Suggest the appropriate name for the following bacteria according to their flagella distribution. 	03

Second Annual 2025 | Section A Q7 | 1 mark

		cells	lymphocytes	cells	platelets
7.	Which structure is present in bacteria for movement?	Pili	Capsule	Flagellum	Cilia

Second Annual 2025 | Section A Q11 | 1 mark

11.	Pilli are made up of pilin which is:	Carbohydrate	Lipid	Protein	Triglyceride

Second Annual 2025 | Section A Q12 | 1 mark

12.	A bacterium with flagella all around is:	Monotrichous	Lopotrichous	Amphitrichous	Peritrichous

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

1.5 + 1.5	OR	Compare three differences in cell wall of gram +ve and gram – ve bacteria.	1x3

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

1.5 + 1.5	OR	Describe bacterial endospore formation as an adaptation.	03

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

Draw and label the phases in bacterial growth curve.	2+1

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

1.5 + 1.5	OR	Brierly describe the types of heterotrophic nutrition in bacteria.	1.5 + 1.5

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

OR	Briefly explain the structure of bacterial flagellum. (No diagram required)	03

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

OR	Differentiate between cyanobacteria and photosynthetic bacteria (any three).	1x3

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

OR	Briefly explain conjugation in bacteria.	03

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

(iii)	What is Parasexuality? Explain transduction in Bacteria.	1+2

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

OR	How and why endospores are formed in bacteria?	2+1

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

(xiv)	Elongated appendages present in bacteria which are smaller than flagella: **a.** What are they called? **b.** Write its chemical composition. **c.** Write down its role.	1x3

SECTION

APOLLO

Protista and fungi

Domain O: Prokaryotes, Protists and Fungi

8.	Trees with mycorrhizal association grow:	Slower than other trees	Better than other trees	Small roots and leaves	Only in favourable conditions