

APOLLO

Chromosome and DNA

FBISE Biology Class 11 (HSSC-I)

Domain H: Reproduction and Inheritance

37 questions | questions

Original FBISE question crops. National Curriculum 2022-23 topic.

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
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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: - In the first experiment by Fredrick Griffith, harmless (non-virulent) <i>Streptococcus pneumoniae</i> 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. - 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

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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

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

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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

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

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
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When RNA polymerase binds to promoter for transcription, the unit which detaches form it is:	α (Alpha)	β (Beta)	γ (Gamma)	θ (Theta)
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The condition in which centromere of a chromosome is located slightly away from the center is termed as:	Acrocentric	Sub metacentric	Telocentric	Metacentric
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OR	What is point mutation? How it causes sickle cell anaemia?	1+2
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First Annual 2025 | Section B Q2(xii) OR | 3 marks

OR	Name any three enzymes with their functions involved in DNA replication.	03
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First Annual 2025 | Section C Q4 | 7 marks

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

(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 any two	

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
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Second Annual 2025 | Section C Q5 OR | 6 marks

Q.5	Explain components of TACT force and its on mechanism.	4+2	OR	lysogenic cycle. Explain four steps of Griffith experiment and conclusions to prove DNA hereditary material.	4+2
Q.6	Explain the role of				

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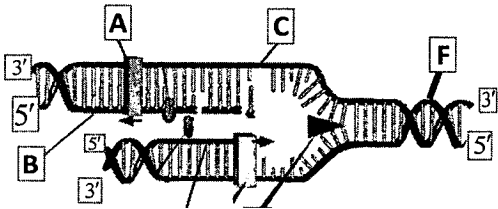
First Annual 2026 | Section B Q2(iii) OR | 3 marks

State three conclusions of Griffith control experiments.	1x3
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First Annual 2026 | Section B Q2(x) OR | 3 marks

OR Describe three steps of Polypeptide elongation during protein synthesis.	1x3
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First Annual 2026 | Section C Q3 OR | 6 marks

Identify parts A – F in DNA replication process and briefly explain each part.	
OR 	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
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First Annual 2026 | Section A Q17 | 1 mark

According to Griffith and Hershy – Chase genetic material proved to be:	DNA	Protein	RNA	Lipid
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First Annual 2026 | Section B Q2(iii) OR | 3 marks

OR What were the findings of Hershey-Chase experiment? Write briefly.	1x3
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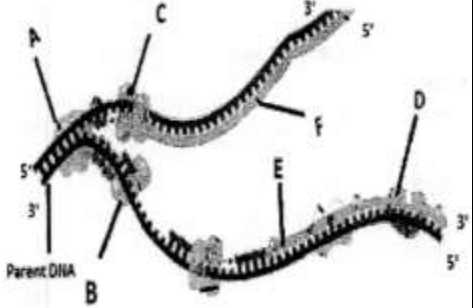
First Annual 2026 | Section B Q2(x) OR | 3 marks

OR Describe three stages of formation of initiation complex during translation process.	1x3
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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
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Carefully observe the following stretch of antisense strand of DNA 5' _____ 3' TACGAGCTTCCGATTCTGA 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
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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
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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	☐	☐	☐	☐
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15.	The semi-conservative model of DNA replication was experimentally proven by:	Watson and Crick	Hershey and Chase	Meselson and Stahl	Griffith
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OR	'chlorophyll b'?	
	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?	1+2
	How this region is different in Prokaryotes and Eukaryotes?	
	Write any three characteristics of annosperms	

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

(xi)	What is meant by degeneracy of genetic code.	03
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First Annual 2026 | Section C Q3 OR | 7 marks

2+3 +2	OR	Explain Meselson Stahl model of semi conservation Model of replication.	07
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First Annual 2026 | Section B Q2(xiii) | 3 marks

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