STELLA MARIS COLLEGE (AUTONOMOUS) CHENNAI 600 086
(For candidates admitted during the academic year 2015 – 2016)

SUBJECT CODE: 15BT/MC/CM54

B. Sc. DEGREE EXAMINATION, NOVEMBER 2017
BRANCH V (a) – PLANT BIOLOGY AND PLANT BIOTECHNOLOGY
FIFTH SEMESTER

COURSE : MAJOR – CORE
PAPER : CELL AND MOLECULAR BIOLOGY
TIME : 3 HOURS MAX.MARKS:100

SECTION – A

ANSWER ALL QUESTIONS (18 x 1=18 marks)

I. CHOOSE THE CORRECT ANSWER (5 X 1 = 5 marks)

1. Which one of the following is not a constituent of cell membrane?
   (i) Cholestrol (ii) Glycolipids
   (iii) Proline (iv) Phospholipids
2. Where is calcium stored?
   (i) Mitochondria (ii) Endoplasmic reticulum
   (iii) Centrioles (iv) Peroxisome
3. In a nucleotide, the nitrogen base is joined to the sugar molecule by
   (i) Phosphodiester bond (ii) Glycosidic bond
   (iii) Hydrogen bond (iv) (i) & (ii)
4. The length of Okazaki fragments in eukaryotes is
   (i) 100-200 nucleotides (ii) 200- 300 nucleotides
   (iii) 300-400 nucleotides (iv) 400-500 nucleotides
5. The stretch of codons between AUG and a stop codon is called
   (i) Open reading frame (ii) TATA box
   (iii) Colinearity (iv) Degenerate

II. FILL IN THE BLANKS (5 x 1 = 5 marks)

6. The term biogenesis was coined by ----------.
7. Chargaff's rules states that DNA from any cell of all organisms should have a 1:1 ratio of ----------and ----------.
8. The synthesis of protein from mRNA is called ----------.
9. The complex process of DNA replication is catalyzed by DNA ---------- and other enzymes.
10. Modifications of 5' ends of eukaryotic mRNA is called ----------.

III. TRUE OR FALSE (4 x 1 = 4 marks)

11. Phytosterol is the major component of plant cell membrane.
12. Ligase is an enzyme responsible for breaking of DNA.
13. Removal of introns and joining of exons in a delinked order during transcription is called looping.
14. The genetic code is the language of genes that translate the information in DNA into the amino acids in a protein.

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IV. MATCH THE FOLLOWING (4 x 1 = 4 marks)

	Column I		Column II
15.	DNA synthesis	-	Manufactures ribosomes
16.	Crick	-	Ribosomes
17.	Nucleolus	-	DNA polymerase
18.	Translation	-	Central dogma
		-	Mitochondria

V. ANSWER ANY SIX QUESTION
Each answer should not exceed 50 words. (6x3=18 marks)

19. What is Microtubule organizing centre (MTOC)?
20. Mention two functions of peroxisomes.
21. What are channel proteins?
22. Give the schematic representation of the phases of cell cycle.
23. Structure of polytene chromosome.
24. Comment on "RNA splicing".
25. What are post translational modifications? Give some examples.
26. Distinguish between 'σ' and 'θ' model of DNA Replication.
27. What is the clover-leaf model?

SECTION B

ANSWER ANY FOUR QUESTIONS. EACH ANSWER SHOULD NOT EXCEED 200 WORDS. DRAW DIAGRAMS WHEREVER NECESSARY. (4x6=24 marks)

28. Give an account of ion channels in plasma membrane.
29. What are histones and non-histones?
30. What are post translational modifications? Give some examples.
31. Compare and contrast the process of transcription in prokaryotes and eukaryotes.
32. Describe the structural assembly and organization of ribosomes.
33. How are Wobble hypothesis and the genetic code correlated with each other?

SECTION C

ANSWER ANY TWO QUESTIONS.EACH ANSWER SHOULD NOT EXCEED 1000 WORDS. DRAW DIAGRAMS WHEREVER NECESSARY. (2x20=40 marks)

34. (a) Describe the structure and functions of endoplasmic reticulum.
    (b) Explain the different aspects of cell cycle. Add a note on control and check points in cell cycle.
35. (a) Give an account on membrane protein.
    (b) Describe the structure and functions of chloroplast.
36. (a) Write notes on structural polymorphism in DNA. How will you convert B-DNA into other DNA forms?
    (b) Explain initiation, elongation and termination of replication in *E.coli*.
37. (a) Briefly describe the process of regulation of gene expression in Lac Operon.
    (b) Comment on the various characteristic DNA binding proteins.

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