

**STELLA MARIS COLLEGE (AUTONOMOUS) CHENNAI 600 086**  
**(For candidates admitted during the academic year 2019 – 2020 & thereafter)**

**B. Sc. DEGREE EXAMINATION, NOVEMBER 2024**  
**BRANCH V (a) – PLANT BIOLOGY AND PLANT BIOTECHNOLOGY**  
**FIFTH SEMESTER**

**COURSE : MAJOR – CORE**  
**PAPER : CELL AND MOLECULAR BIOLOGY**  
**SUBJECT CODE : 19BT/MC/CM54**  
**TIME : 3 HOURS** **MAX.MARKS:100**

**SECTION – A**

**ANSWER ALL QUESTIONS**

**(18 x 1=18 Marks)**

**I. CHOOSE THE CORRECT ANSWER:**

- Elementary particles are found in  
(a) Mitochondria (b) Peroxisomes (c) Golgi body (d) Endoplasmic reticulum
- Ingestion of liquids by the plasma membrane is called  
(a) Phagocytosis (b) pinocytosis (c) osmosis (d) diffusion
- In Chargaff's rule for base composition in DNA the base A is equal to  
(a) Guanine (b) Thymine (c) Cytosine (d) Uracil
- Which of these is called the quiescent stage of the cell cycle?  
(a) G<sub>0</sub> (b) G<sub>1</sub> (c) G<sub>2</sub> (d) G<sub>3</sub>
- Eukaryotic ribosomes contain \_\_\_\_\_ larger sub unit and \_\_\_\_\_ smaller unit.  
(a) 50S & 30 S (b) 20S & 50S (c) 60S & 40S (d) 30S & 40S

**II. FILL IN THE BLANKS:**

- The division of cytoplasm during cell division is known as \_\_\_\_\_.
- Golgi apparatus in plants are called \_\_\_\_\_.
- During meiosis the crossing over takes place in \_\_\_\_\_ stage of prophase I.
- Stop codons are also called as \_\_\_\_\_ codons.
- The enzyme involved in Photoreactivation is called \_\_\_\_\_.

**III. MATCH THE FOLLOWING:**

- |                |   |                    |
|----------------|---|--------------------|
| 11. DNA Pol I  | - | Stroma             |
| 12. DNA gyrase | - | Reproductive cells |
| 13. Thylakoids | - | Kornberg enzyme    |
| 14. Meiosis    | - | Topoisomerase      |

**IV. STATE WHETHER THE FOLLOWING STATEMENTS ARE TRUE OR FALSE:**

- The B DNA is the most stable of the three forms of DNA.
- The process of transcription is catalyzed by DNA polymerase.
- SER is well developed in cells engaged in lipid metabolism.
- Pribnow box in prokaryotes is the same as Hogness box in eukaryotes.

**V. ANSWER ANY SIX QUESTIONS:****Each answer should not exceed 50 words.****(6x3=18 Marks)**

19. Quantasomes
20. Zygotene
21. Peroxisomes.
22. Pribnow box
23. Histones
24. Cell theory
25. DNA Ligase
26. F<sub>1</sub> Particle
27. Draw the clover leaf structure of t RNA

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

28. Explain the ultrastructure of Chloroplast.
29. Highlight the importance of the fluid mosaic model of plasma membrane.
30. Illustrate the photoreactivation process of DNA repair.
31. Explain the molecular organisation of chromosomes.
32. Discuss the characteristics of genetic code.
33. Illustrate the Prophase I of Meiosis.

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

34. Describe how the nucleus is organized in the cell. What is the structure and function of the nucleolus? Add a note on the nucleolar organizing region.
35. How is DNA replicated in *E.coli*? What are the enzymes involved?
36. Give a detailed account of prokaryotic gene regulation using lac operon model.
37. Elaborate the prokaryotic transcription.

\*\*\*\*\*