[This question paper contains 4 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 4955 G

Unique Paper Code : 42167902

Name of the Paper : Cell and Molecular Biology

Name of the Course : B.Sc. | | Life Sciences DSE

Semester : V

Duration : 3 Hours Maximum Marks : 75

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt any **five** questions in all.
3. Question No. **1** is compulsory.
4. **All** questions carry equal marks.
5. Attempt **all** parts of a question together.

1. (a) Comment on the following **(any five)** (5×1=5)

   (i) Heterochromatin

   (ii) Marker enzyme

   (iii) Exon

   (iv) Promoter

P.T.O.

(v) Fluorochrome

(vi) Idiogram

(vii) Resolving power

(b) Fill in the blanks **(any five)** (5×1=5)

(i) A microscope has a 4x ocular lens and a 10x objective, the microscope's total magnification is _____ x.

(ii) Spindle apparatus is formed during _____ stage of mitosis

(iii) X-ray diffraction is based on the principle of _____ .

(iv) The enzyme _____ binds to a region of a gene called the promoter to initiate transcription.

(v) A non-membranous organelle of a cell is _____ .

(vi) The "cell theory" was proposed by _____ .

(c) Expand the following **(any five)** (5×1=5)

(i) CPD

(ii) SER

(iii) CDS

(iv) cAMP

(v) hnRNA

(vi) UTR

(vii) GTF

2. Differentiate between the following : (5×3=15)

(i) Light Microscope and Electron microscope

(ii) Prokaryotic transcription and Eukaryotic transcription

(iii) Mitosis and Meiosis

(iv) A-DNA and Z-DNA

(v) Lac operon and Tryptophan operon

3. Comment, in brief, on the following **(any three)** (3×5=15)

(i) Confocal Microscope

(ii) Nuclear pore complex

(iii) Ultrastructure of mitochondria

(iv) Fluidity of Plasma membrane

4. Write short notes on the following **(any three)** (3×5=15)

(i) DNA packaging in Eukaryotes

P.T.O.

(ii) Semiautonomous nature of chloroplast

(iii) Theta mode of replication

(iv) Carbohydrates in the membrane

5. (a) Draw the ultrastructure of nucleus and mention its functions. (5)

(b) Discuss the salient features of genetic code. (5)

(c) Describe the experiment that demonstrated that DNA is the genetic material using radioisotopes. (5)

6. (a) Lysosomes are known as suicidal bags. Comment. (5)

(b) What is cell cycle? Discuss the molecular control of the cell cycle. (5)

(c) Differentiate between transmission electron microscope and scanning electron microscope. (5)

7. (a) Elaborate the various steps of translation in prokaryotes. What are the differences in translation process between eukaryotes and prokaryotes? (8)

(b) Draw well labelled diagrams of Prokaryotic and Eukaryotic cell, highlighting the similarities and differences. (7)