1128
B.Sc. (Hons.) Bio-Informatics
Third Semester
BIN-3001: Fundamentals of Molecular Biology

Time allowed: 3 Hours   **Max. Marks: 60**

NOTE: Attempt <u>five</u> questions in all, including Question No. I which is compulsory and selecting two questions from each Unit.

x-x-x

I.   Briefly answer the following:-

    a)   Sigma mode of bacterial DNA replication

    b)   Okazaki fragment

    c)   5' CAP I and CAP 2

    d)   Constitutive and inducible enzymes with examples

    e)   Wobble hypothesis

    f)   What are Priibnow-Schaller Box and TATA Box?   (6x2)

UNIT – I

II. a) Describe the bacterial DNA replication by theta mode. How much time will it take to finish replication of a bacterial chromosome of 4×10^6 bp by theta mode?

    b) Illustrate the structure of DNA Polymerase III of *E.coli*   (6,6)

III. a) Describe the mechanism of SOS DNA repair.   (6)

    b) What are the functions of alpha, sigma70 and sigma32 components of *E.coli* RNA polymerase?   (6,6)

IV. a) Describe the mechanism of splicing of RNA in eukaryotes

    b) What do you understand by the processes of mRNA Editing and stability.   (6,6)

UNIT – II

V.   a) What are the mechanisms of mutation by UV, HNO_2 and 5-Bromouracil?

    b) Design an experiment to isolate a proline auxotroph by mutation of *E. coli* with UV.   (6,6)

P.T.O.

VI.   a) Draw the structure of Lac operon. What is the mechanism of its catabolite repression by glucose?

   b) Draw the structure of Trp operon. What is the role of attenuation in its expression?

(6,6)

VII.   a) Differentiate IS from Tn. What is the mechanism of transposition of Tn10?

   b) Give the differences between prokaryotic and eukaryotic translation.   (6,6)

x-x-x