Total number of printed pages–4

3 (Sem–4/CBCS) BOT HC 1

2024

BOTANY

(Honours Core)

Paper : BOT–HC–4016

(Molecular Biology)

Full Marks : 60

Time : Three hours

The figures in the margin indicate full marks for the questions.

1. Choose the correct answer of the following : 1×7=7

   (a) What is the main component of the smooth colonies of *Diplococcus pneumoniae* ?

   (b) Define *hn*RNA.

   (c) What is spliceosome ?

   (d) Give *one* example of promoter which helps in transcription.

   (e) What is cot curve ?

Contd.

(f) Which of the following codons acts as stop codon in the transcription process ?

(i) AUG

(ii) UAA

(iii) AAA

(g) What is denaturation of DNA ?

2. Answer the following questions briefly : 2×4=8

(a) What do you mean by 'Gene Expression' and how transcription regulation in prokaryotes takes place through operon concept ?

(b) What are the differences between euchromatin and heterochromatin ?

(c) Define Wobble hypothesis giving stress on the economy of *t*RNA molecule.

(d) Mention the characters of eukaryotic RNA polymerases.

3. Answer ***any three*** of the following questions : 5×3=15

(a) "The whole world can be called as RNA world." Justify.

(b) Describe the process of rolling circle replication in prokaryotes.

(c) Discuss Avery, MacLeod and McCarty experiment and prove that DNA is genetic material.

(d) What is guide RNA and how does it help in RNA editing ?

(e) Define transcription and mention different steps of prokaryotic transcription.

4. Answer the following questions : ***(any three)*** 10×3=30

(a) What do you mean by central dogma of protein synthesis process ? Describe the process of synthesis of protein in eukaryotes. 2+8=10

(b) Define operon. How is transcription regulated in Lac-operon for the metabolism of lactose in bacteria ? 2+8=10

(c) Elaborate the Watson an Crick's model of DNA structure. What are the salient features of chloroplast DNA ? 7+3=10

(d) What are the differences between prokaryotic and eukanyotic ribosomes ? Explain the different sites of a ribosome with suitable diagram. 5+5=10

(e) What is replica ? Describe unidirectional and bidirectional replication of DNA. What are the enzymes involved in DNA replication ? 2+6+2=10

(f) Write detailed notes on the following : 5×2=10

(i) Heat shock proteins;

(ii) Peptide hormones.