4. Describe structure, function and mechanism of action of p^{53} tumor suppressor proteins. 20

OR

What is 'Antisense Molecules' ? Describe molecular mechanism of antisense molecules and their role in disruption of RNA structure. 20

5. Describe in detail the role of Southern and fluorescence *in situ* hybridization for genome analysis. 20

OR

Describe the role of DNA markers like RFLP, AFLP, RAPD and SSRs in genome analysis. 20

AQ–933

M.Sc. (Part–I) Semester–II (CBCS Scheme) Examination

BIOTECHNOLOGY (2 BTB 1)

(Molecular Biology)

Paper–V

Time—Three Hours] [Maximum Marks—100

Note :— (i) ALL questions are compulsory and carry equal marks.

(ii) Draw well labelled diagrams wherever necessary.

1. Attempt the following :

(a) What impact does the inability of DNA polymerase to synthesize DNA in 3'→ 5' direction have on DNA replication ? 5

(b) Draw a fully annotated diagram of the Holliday model for Homologous recombination. 5

(c) Describe the base excision repair system in prokaryotes. 5

(d) Give a detailed description of the structure of *E. coli* origin of replication. 5

OR

(p) Outline the role of each component in the initiation of replication in prokaryotes. 5

(q) Describe the role of transposons in the recombination. 5

(r) Explain why DNA replication must be primed and describe how the priming problem is solved by *E. coli*. 5

(s) Explain the SOS repair system in prokaryotes. 5

2. Explain :

(a) Structure and function of RNA polymerase holoenzyme in prokaryotes. 5

(b) Termination of transcription in prokaryotes. 5

(c) Series of events that result in capping of a eukaryotic mRNA. 5

(d) Mechanism of splicing. 5

OR

(p) Define the term 'promoter'. Draw annotated diagram to illustrate the structures of the promoters for the three eukaryotic RNA polymerases. 5

(q) Series of events that results in polyadenylation. 5

(r) Structure and function of sigma factor. 5

(s) Name and outline the functions of three different elongation factors for eukaryotic RNA polymerase-II. 5

3. Explain :

(a) How is translation initiation regulated in prokaryotes ? 5

(b) Structure of eukaryotic ribosome. 5

(c) Receptor mediated endocytosis. 5

(d) Localization of proteins in peroxisomes. 5

OR

(p) Give a detailed description of elongation phase of translation in eukaryotes. 5

(q) Structure of prokaryotic ribosome. 5

(r) Glycosylation. 5

(s) Activation of amino acid. 5