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HDU-MICRO-313 Seat No. _____

M. Sc. (Microbiology) (Sem. III) (CBCS) Examination

November / December – 2017

Micro-313 : Genome Organization & Regulation of Gene Expression

(Core - I)

Time : $2\frac{1}{2}$ Hours] [Total Marks : **70**

Instructions : (1) All questions are compulsory and carry equal marks.

(2) Support your answers with suitable illustrations.

1 Answer Any **Seven** : (2 Marks each) **14**

(a) What are the nucleosomes?

(b) What is the significance of genome organization?

(c) Explain how lactose acts as inducer in the lac operon?

(d) Is it possible to alter the status of inducibility of the lac operon?

(e) How histone modifications affect the genome organization?

(f) Explain why cAMP is considered as the global starvation signal?

(g) What is transposition?

(h) State the key features of the viruses.

(i) What are the characteristics of Viroids?

(j) What is C-value paradox?

2 Answer Any **Two** of the following : (7 marks each) **14**

(A) Describe eucaryotic genome organization.

(B) Describe the significance and strategies of genome organization in bacteria.

(C) In a comparative manner, describe prokaryote and eukaryote genome structure.

3 (A) Describe an inducible operon which is under, both positive and negative control. **7**

(B) What is the attenuation control of the transcription? Discuss with a suitable example. **7**

OR

3 (A) What are the basic regulatory strategies among the prokaryotes and eukaryotes? Discuss. **7**

(B) Discuss with suitable example how both, carbon and nitrogen signals regulate the utilization of amino acid. **7**

4 (A) Discuss how mutations in lac operon can change the status of the inducibility. **7**

(B) Discuss conjugation and molecular events leading to DNA transfer in bacteria. **7**

5 Answer Any **Two** of the followings : (7 marks each) **14**

(A) Discuss how tertiary structures of lac repressor and CAP affect their binding.

(B) Discuss transcriptional control by exchange of sigma factor of the RNA Poloymerase

(C) With suitable example explain bacterial transposition.

(D) With an updated status of prions, discuss biochemical and molecular basis of their infectivity.