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| **col LOGO outline**  Register Number:  DATE: **21-04-2017**  **ST. JOSEPH’S COLLEGE (AUTONOMOUS), BENGALURU-27**  **B.Sc. MICROBIOLOGY- IV SEMESTER** |
| **SEMESTER EXAMINATION: APRIL 2017** |
| **MB 415 – Microbial Genetics and Molecular Biology** |

**Time: 1 1/2 hrs Max. Marks - 35**

**This paper contains ONE printed page and THREE parts**

**I. Answer any FIVE of the following 5x2=10 marks**

1. What is the difference between a nucleoside and a nucleotide?
2. What are the subunits of histone octomer? How much DNA is associated with each of the histone octomer?
3. What is photo reactivation repair?
4. Define transposition and give one example each for an IS element and composite transposon.
5. Differentiate F+ and Hfr strains.
6. Write important features of tRNA.
7. Define promoter and origin of replication.

**II. Answer any FOUR of the following 4x5=20 marks**

1. Describe the activities that DNA polymerase I and III carry out during and post replication.
2. Define spontaneous and induced mutations. Describe how alkylating agents causes mutations in DNA.
3. Describe the mechanism of Natural transformation with a neat labeled diagram.
4. What is Nucleotide excision repair? How does that occur?
5. Explain the mechanism of prokaryotic transcription.
6. How does the positive regulation of Lac operon system function?

**III. Answer the following 1X05=05 marks**

1. An *E.coli* bacterial strain freshly isolated from a sample was found to be mutant for β-galactosidase enzyme and lacks the fertility factor. In order to make the bacteria utilize lactose the researcher thought of transferring the gene for β-galactosidase synthesis into the bacteria. The gene was present on a fertility plasmid of another *E.coli strain*. Which of the three natural occurring gene transfer mechanisms do you think the researcher would have used to transfer β-galactosidase gene to *E.coli* mutant and why?

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