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The West Bengal University of Health Sciences

B.Sc. in Medical Microbiology 4th Semester November, 2023 Examination

Subject : Molecular Biology

Time : 2 hrs. **Full Marks : 50**

*Attempt **all** questions*

1. Tick the correct answer : 10 x 1
   a) RNA polymerase binds on :
      i) Promoter gene. ii) Operator gene. iii) Lac I gene. iv) None of these.
   b) Which enzyme is used to join nicks in the DNA strand?
      i) Primase. ii) DNA polymerase. iii) DNA ligase. iv) Endonuclease.
   c) Which enzyme is used in the unwinding of DNA?
      i) Ligase. ii) Topoisomerase. iii) Helicase. iv) Exonuclease.
   d) During DNA replication the proof reading is performed by :
      i) DNA polymerase I. ii) DNA polymerase II.
      iii) DNA polymerase III. iv) All of these.
   e) Transfer of genetic material from the donor to recipient bacterium through cell contact is termed as :
      i) Transduction. ii) Recombination. iii) Conjugation. iv) Transformation.
   f) The F plasmid (F factor) in bacterial conjugation carries genes responsible for :
      i) Antibiotic resistance. ii) Virulence factors.
      iii) Metabolic functions. iv) All of the above.
   g) The transfer of an entire F plasmid during conjugation is called:
      i) F+ to F- transfer. ii) F- to F+ transfer.
      iii) F-plasmid transfer. iv) Plasmid fusion transfer.
   h) Which of the following mechanisms will remove uracil and incorporate the correct base?
      i) Direct repair. ii) Base excision repair.
      iii) Mismatch repair. iv) Nucleotide excision repair.
   i) What is the function of enzyme involved in base excision repair?
      i) Addition of correct base. ii) Addition of correct nucleotide.
      iii) Removal of incorrect base. iv) Removal of phosphodiester bond.
   j) The enzyme photolyase is used in what method of repair?
      i) Base excision. ii) Photo reactivation.
      iii) Nucleotide excision. iv) None of the mentioned.

2. Answer ***any four*** of the following questions : 4 x 2
   a) What is transposon?
   b) Write down the functions of DNA helicase and SSBP protein
   c) What is R plasmid? Give example.
   d) What do you mean by copy number of a plasmid?
   e) Write down the rho dependent termination of transcription in brief.
   f) What is t RNA charging?

3. Answer ***any four*** of the following questions : 4 x 4
   a) Write down briefly the process of polyadenylation.
   b) What is photoreactivation?
   c) What is BER and NER?
   d) Write down how SOS repair occurs after a DNA being damaged?
   e) Write a short note on episomes.
   f) What is conjugate plasmid? Give example.

4. Answer ***any two*** of the following questions : 2 x 8
   a) What is operon? Enumerate the regulation off trp operon.
   b) Describe the process of DNA replication.
   c) Write down the process of generalized and specialized transduction.