JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATIONS-2024

M.Sc. 2nd Semester Microbiology

COURSE CODE (CREDITS): (21MS1MB212) MAX. MARKS: 15

COURSE NAME: MICROBIAL GENETICS AND PHYSIOLOGY

COURSE INSTRUCTORS: Ashok Kumar Nadda MAX. TIME: 1 h

Note: All questions are compulsory. Marks are indicated against each question in square brackets.

Section I

Q1 Very short answer type questions. Each question is carrying 0.5 marks.

(a) If an organism is using hydrogen or iron as electron acceptor in metabolic pathways to produce energy then what we can call these organisms? Give example of each one of them. **(Mark 0.5)**

(b) Differentiate between dominance and epistasis. **(Mark 0.5)**

(c) What percentage of the human genome is made up of transposable elements? **(Mark 0.5)**

(d) Highlight 2-3 unique features of bacterial DNA. **(Mark 0.5)**

(e) What type of lethal genes leads to the onset of Huntington's disease? **(Mark 0.5)**

Section II

Q 2 Explain why an organism like *Desulfovibrio* could grow as an anaerobic lithotroph, while *Acidithiobacillus ferrooxidans* growing on $FeSO_4$ would be an obligate aerobe. **(Marks 1.5)**

Q 3 Differentiate between batch culture and continuous cultures. Among both of these cultivation strategies which one has higher chances of strain mutation and why? **(Marks 02)**

Q 4 Discuss the role of various genes of Lac Operon. **(Marks 02)**

Q 5 Write a brief note on annamox bacteria. Give their example and applications. **(Marks 02)**

Section III

Q 6 Hemophilia is a hereditary disease caused by deficiencies in clotting factors, which results in impaired blood clotting is genetic disorder. Give a brief account of genetic disorder associated with the development of haemophilia. **(Marks 2.5)**

Q 7 What are the different types of transposable elements found n prokaryotes? Discuss the mechanism of transposition with the help of diagram. **(Marks 2.5)**