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SUBJECT CODE NO: SS-6504
FACULTY OF SCIENCE AND TECHNOLOGY
M.Sc. (Zoology) (Sem-II)
Examination May / June - 2023
Genetics and Bioinformatics-ZOO-201

[Time: 3:00 Hours]

[Max. Marks: 80]

Please check whether you have got the right question paper.

N. B.

- 1) All questions carry equal marks.
- 2) Draw well labelled diagrams wherever necessary.

Part –A

Q1 Attempt the following multiple choice questions:

20

- 1) The genetic codon is a triplet & there are 64 codons. How many codons would be possible if the codon is a doublet?
a) 4 b) 8 c) 16 d) 32
- 2) Which of the following statement correctly describes the recombination frequency between two genes?
 - a) The closer the two genes are to each other on a chromosome higher is the frequency of recombination between them.
 - b) The more distant the two genes are to each other on a chromosome higher is the frequency of recombination between them.
 - c) If two genes are located on some chromosome, then no recombination events can occur between them?
 - d) If two genes are located on different chromosomes, then the frequency of recombination is high between them.
- 3) Which of the following is/are the example/examples in complete dominance?
 - i) ABO blood grouping in humans.
 - ii) *Mirabilis j alapa*
 - iii) Human hair colora) Only I b) only II c) Only I & II d) I, II & III
- 4) An exception to Mendel's law of independent assortment is -----
 - a) Incomplete dominance b) codominance c) Nondisjunction d) Linkage

- 5) The principle of genetic linkage refers to -----.
- The observation that some genes will be inherited together if they are located in the same chromosome
 - The observation that darkly stained regions of chromosomes do not contain genes
 - The discovery that multiple genes are responsible for same trait
 - The fact that the different levels for a given gene will be located at the same position in a chromosome.
- 6) Complementation test also called a' cistrans "test is -----
- A cross that can identify if mutation at one gene locus is dominant
 - A test to see if two genes affect each other
 - A cross that can identify if a mutation at one gene locus is recessive
 - A cross that can identify if a phenotype is caused by mutations within the same gene of different genes
- 7) Which of the following is the example of biological secondary database
- SWISS- PROT
 - EMBL
 - PDB
 - PROSITE
- 8) How does genome complexity of denatured DNA measure
- Giemsa staining
 - Reverse chromatography
 - Denaturation kinetics
 - Renaturation kinetics
- 9) The central block of the composite transposable elements consists a gene for ----
- Antibiotic resistance
 - transposase
 - integrase
 - lactamase
- 10) The term bioinformatics was coined by -----
- Singer & Nicolson
 - Hogeneg & Hesper
 - Johannsen & Wilhelm
 - Khorana & Kornberg

Part- B (any five)

- Q2** What is bioinformatics? Write down the scope of bioinformatics with its applications **12**
- Q3** Give detailed account of transposable elements in eukaryotes with its significance. **12**
- Q4** Describe the types of sequence alignment along with primary methods of producing pairwise sequence alignment. **12**

- Q5** Describe the nucleosome model of chromosome in detail. **12**
- Q6** What is gene interaction? Explain epistasis with suitable examples? **12**
- Q7** Explain the genetic mapping by tetrad analysis in Neurospora. **12**
- Q8** Write note on: (Any Two) **12**
- a) Artificial gene synthesis
 - b) C- value paradox
 - c) Incomplete linkage