## M.Sc. BIOTECHNOLOGY Third Semester BIOSTATISTICS, BIOINFORMATICS & IPR (MBT - 301)

Duration: 3Hrs.

Full Marks: 70

Part-A (Objective) =20 Part-B (Descriptive) =50

(PART-B: Descriptive)

Duration: 2 hrs. 40 mins.

Marks: 50

## Answer any four from Question no. 2 to 8 Question no. 1 is compulsory.

What are the different measures of central tendency? What are the desirable properties for arithmetic mean? A clerk calculated arithmetic mean of 50 values as 39.2. However; it was found that instead of taking two values as 25 and 32, he took them as 52 and 23. Find the corrected arithmetic mean. (3+3+4=10)

2. (5+5=10)

- (i) A husband and wife appear in an interview for two vacancies in the same post. The probability of husband's selection is 1/7 and that of wife's selection is 1/5. What is the probability that:
  - d) Both of them will be selected
  - e) Only one of them will be selected
  - f) None of them will be selected
- (ii) The incidence of occupational disease in an industry is such that the workers have 20 percent chance of suffering from it. What is the probability that out of six workers 4 or more will come in contact of the disease?
- 3. What is sampling? Critically examine the well–known methods of sampling technique. (2+8=10)

a) Define local and global sequence alignment.

b) Calculate the identity and similarity percentage of Seq 1 to Seq 2, in the following pair wise sequence alignment?

Seq 1: A-T-G-G-C-C-T-T

Seq 2: A-T-G-G-C-C

- c) Describe the applications of nucleic acid sequence comparison and homology analysis.
- 5. What do you mean by molecular phylogeny? Explain the steps of phylogenetic tree construction? Mention the names of different methods of constructing such trees.

(2+5+3=10)

6. (2+3+5=10)

- a) What are the various types of biological databases?
- b) Explain the Gen Bank file format.
- c) What are the various steps of drug discovery?
- 7. What is patent? How patent is granted and which safeguards are given under patent law. (2+8=10)

8. (2+3+5=10)

- a) What do you mean by Geographical Indication? How it protects the interests of producers and consumers?
- b) Write the case study of protection of turmeric under intellectual property rights.

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## M.Sc. BIOTECHNOLOGY Third Semester BIOSTATISTICS, BIOINFORMATICS & IPR (MBT - 301)

(NID1-301)			
Duration: 20 minutes Marks – 20			
(PART A - Objective Type)			
I. Choose the correct answer: 1×15=15			
<ul> <li>1. Which of the following relationship is true in a multimodal distribution?</li> <li>a) Mean-mode = 3 (mean-median)</li> <li>b) Mode= 3 median - 2 mean</li> <li>c) Median = (2mean + mode)</li> <li>d) All of the above</li> </ul>			
2. Coefficient of quartile deviation is calculated by the formula a) $\frac{(Q_3 + Q_1)}{4}$ b) $\frac{(Q_3 + Q_1)}{2}$ c) $\frac{(Q_3 - Q_1)}{(Q_3 + Q_1)}$ d) None of the above			
<ul> <li>3. A binomial distribution may be approximated by a Poisson distribution provided</li> <li>a) n is small and p is large</li> <li>b) n is large and p is small</li> <li>c) n is large and p is large</li> <li>d) n is small and p is small</li> </ul>			
4. Find <sup>n</sup> C <sub>r</sub> , if n=9 and r=3 a) 84 b) 46 c) 42 d) 40			
<ul> <li>5. Which of the following is non-probability sampling?</li> <li>a) Purposive sampling</li> <li>b) Random sampling</li> <li>c) Cluster sampling</li> <li>d) Stratified sampling</li> </ul>			
6. The standard deviation of the binomial distribution is: a) np b) $\sqrt{np}$ c) npq d) $\sqrt{npq}$			
<ul> <li>7. All normal distributions are:</li> <li>a) Bell – shaped</li> <li>b) Symmetrical</li> <li>c) Defined by its parameters μ and σ</li> <li>d) All of the above</li> </ul>			
<ul> <li>8. If b<sub>xy</sub> is negative, then b<sub>yx</sub> is,</li> <li>a) Negative</li> <li>b) Positive</li> <li>c) Zero</li> <li>d) None of the above</li> </ul>			
<ul><li>9. Which of the following is not a nucleotide database?</li><li>a) GenBank</li><li>b) EMBL</li></ul>			

d) UniProt

c) DDBJ

10. Which of the following is a a) pfam b) processor b) processor b) PDB d) KE		
<ul><li>11.In a phylogenetic tree, 'dist</li><li>a) The common ancestor of</li><li>b) It represents the number</li><li>c) It is located between a no</li><li>d) None.</li></ul>	f all taxa. of differences between the organisms or s	equences.
b) Adsorption, Distribution	, Metabolism, Excretion and Toxicity. , Metabolism, Extraction and Toxicity. , Metal, Elimination and Toxicity.	
<ul><li>a) Compares sequences and</li><li>b) Will return only the best</li></ul>	correct in respect to global sequence alignment gives best overall alignment. matching segment for a given pair of sequence local region of similarity (e.g. a common sequence)	uences.
<ul><li>14.Multiple Sequence Alignme</li><li>a) Detecting similarities bet</li><li>b) Detecting conserved region</li><li>c) Detection of structural hold</li><li>d) All.</li></ul>	ions.	wing purposes
<ul><li>15.A lead compound is a drug</li><li>a) Natural products</li><li>c) Serendipity</li></ul>	originally discovered by b) High-throughput screening d) All	
II. Match the following:		1×5=5
(a) Trade secret	(i) Patent	
(b) One Indian Girl	(ii) GI	
(c) Darjeeling tea	(iii) copyright	
(d) Trademark	(iv) coca-cola	
(e) PCR	(v) logo of nike	
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