M.Sc. BOTANY
Fourth Semester (Repeat)
BIOSTATISTICS, COMPUTER APPLICATION
& BIOINFORMATICS
(MSB - 401)

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.

1. A batch of 10 students appeared in two plant Physiology papers. Their scores in the two papers were as follows: (10)

   Paper I : 15 29 22 28 25 20 27 29 25 24

   Paper II: 12 22 25 16 30 14 29 22 24 20

   Test if the mean difference of scores is significant.

   (Table value of t 5% for 9 d.f is 2.26)

2. How do you calculate identity and similarity percentage between two sequences in a pairwise sequence alignment? Give Example. Explain 'Match', Mismatch', 'Gap' and 'Score' in a sequence alignment event. (5+5=10)

3. What do you mean by biological databases? What are the different types of it? Give example. Briefly explain on NCBI database. (2+5+3=10)

4. Name the principles of design of experiments. An experiment was conducted in Randomized block Design with 4 treatments in 5 blocks. Show the sources of variation and the corresponding degrees of freedom of the ANOVA table. (10)

5. Write the formula for calculating the Regression coefficient of Y on X. Write the formula for calculating 'Paired t'. Write short note on random sampling.

$$(3+3+4=10)$$

6. What is Computer? Give the classification of computer. What do you mean by memory unit? Differentiate between main memory and auxiliary memory.

$$(2+3+2+3=10)$$

7. Discuss the important features of various generations of computers. Give some examples of computers for each generation. $(8+2=10)$

8. Define 'Cladogram' and 'Dendograms'. What are the basic steps of phylogenetic tree construction? Mention the steps to choose an appropriate molecular phylogeny method. $(2+5+3=10)$

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Duration: 20 minutes

Marks – 20

(PART A - Objective Type)

I. Choose the correct answer: 1×15=15

1. Which of the following is a nucleotide database?
   a. Gene Bank
   b. EMBL
   c. DDBJ
   d. All

2. Which of the following database is for protein dimensional structure?
   a. Pfam
   b. Prosite
   c. PDB
   d. KEGG

3. In a phylogenetic tree , 'distance scale' means:
   a. The common encestor of all taxa.
   b. It represents the number of differences between the organisms or sequences.
   c. It is located between a node and leaf.
   d. None.

4. Multiple sequence Alignment (MSA) is very often used for the following purposes:
   a. Detecting similarities between sequences.
   b. Detecting conserved regions.
   c. Detecting of structural homologies.
   d. All.

5. BLAST stands for:
   a. Basic local Alignment Search Tool
   b. Best Local Alignment Search Tool
   c. Basic Local Alignment Search Test
   d. Best Local Alignment Search Test

6. Dendograms depict which of the following?
   a. Times of divergence
   b. Relative recentness of a common ancestry
   c. Amount of evolutionary change
   d. None

7. If there is a strong similarity among the sequences in a multiple sequence alignment event, which method is suitable for molecular phylogenetic analysis?
   a. Maximum parsimony
   b. Maximum likelihood
   c. Distance methods
   d. None

8. _____is called the brain of Computer.
   a. ALU
   b. Memory
   c. CPU
   d. Input Device

9. A multimedia computer accepts input in the form of:
   a. Text
   b. Images
   c. Graphics & Voice
   d. All of these

10. A group of_____ bits is called a byte.
   a. 4 bits
   b. 8 bits
   c. 16 bits
   d. 10 bits

11. Notebook computers, also known as_____ computer.
   a. Palmtop
   b. Desktop
   c. Servers
   d. Laptop

12. Which of the following is not an example of Super Computer?
   a. NEC's SX-S/44
   b. Cray – 1
   c. Cray – 2
   d. IBM's Thinkpad 570.

13. If mean and coefficient of variation of a set of data is 10 and 5, respectively, then the standard deviation is:
   a. 10
   b. 50
   c. 5
   d. None of the above

14. The sum of squares of deviations from mean is:
   a. Maximum
   b. Minimum
   c. Zero
   d. None of the above

15._____is used in Second generation computers.
   a. Vacuum Tube
   b. Transistor
   c. Integrated circuit
   d. None of the above

II. Tick the right ones and cross the wrong ones: 1×5=5

1. Probability of occurrence of an event cannot be more than 1.

2. Normal curve is a symmetric curve.

3. The value occurring highest number of times is the median.

4. The value of correlation coefficient lies in between -1 and +1.

5. Correlation coefficient r is the square root of the product of the regression coefficients.

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University of Science and Technology, Meghalaya

SESSION 2016-17

COURSE_____PAPER Code:_____

NAME OF THE PAPER:_____

SEMESTER_____

Instructions to Candidates

1. This answer booklet has 4 pages. Please check before writing whether it is complete or in good condition.

2. Do not write your name anywhere in the answer booklet.

3. Write legibly on both sides of the paper

4. You may use some space for any rough notes or calculation on the answer booklet if you need. These rough notes, calculations must be scored out before submitting the answer booklet.

5. Do not bring any book or loose paper in the examination hall.

6. Do not tear any page from the answer booklet.

7. Do not write anything on the question paper or blotting paper or any pieces of paper while you are in the examination hall.

8. Any act of indiscipline or misbehavior in the examination hall will result in your expulsion.

9. No examinee is allowed to leave the examination hall until 30 minutes lapse after the commencement of the examination.

10. Additional answer sheet will be supplied after the main answer booklet is completed.

For Objective Type Questions	
Page No.	Marks
Total	

For Descriptive Type Questions	
Question No.	Marks
Total	
Grand Total	

Session: 2016-17

Course_____

Roll No._____

Enrollment No._____

Semester_____

Name of the Paper_____

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Paper Code_____

Scrutinizer's Signature   Examiner's Signature   Invigilator's Signature