SET A

M.Sc. BOTANY
FOURTH SEMESTER
BIOSTATISTICS, COMPUTER APPLICATION & BIOINFORMATICS
MSB-401

[USE OMR SHEET FOR OBJECTIVE PART]

Duration: 3 hrs. Full Marks: 70

Objective

Time: 30 mins. Marks: 20

Choose the correct answer from the following: *1×20=20*

1. DEMUX is also called:
   a. Data distributor b. Data selector
   c. Data analyzer d. None
2. In 4:1 MUX, the number of select line is:
   a. 3 b. 2
   c. 1 d. 4
3. The 2's compliment of the number 10101101 is:
   a. 01010010 b. 01100001
   c. 01010011 d. 10100001
4. The 2nd generation of Computer consists of:
   a. Vacuum Tube b. Transistor
   c. IC d. AI
5. The number of NAND gates required to design an AND gate are:
   a. 3 b. 4
   c. 2 d. 1
6. The hexadecimal form of the binary number 11111010 is:
   a. AF b. CD
   c. DC d. FA
7. CPU consists of:
   a. ALU & Memory b. ALU & Control Unit
   c. Control Unit & Memory d. All of these
8. Which of the following is not statistics?
   a. Good students in the class b. Paddy production in Assam for last five years
   c. Heights of two students, weights of five students d. None of the above
9. .....is effected by the extreme values.
   a. Mean b. Median
   c. Mode d. None of the above
10. The best measure of dispersion is:
    a. Mean b. Mean deviation
    c. Standard deviation d. None of the above

11. .....is a continuous probability distribution.
    a. Binomial distribution
    b. Poisson distribution
    c. Normal distribution
    d. None of the above

12. The selection of sampling units from a population at random, is known as:
    a. Non-probability sampling
    b. Probability sampling
    c. Mixed sampling
    d. None of the above

13. Which of the following statement is a null hypothesis?
    a. There is no significant difference between the true and a hypothetical value of a parameter
    b. There is significant difference between the true and a hypothetical value of a parameter
    c. True value of a parameter is more than the hypothetical value
    d. True value of a parameter is less than the hypothetical value

14. Student's t-test is applied when:
    a. Sample size is large and the population standard deviation is not given
    b. Sample size is large and the population standard deviation is given
    c. Sample size is small and the population standard deviation is not given
    d. Sample size is small and the population standard deviation is given

15. Which of the following is an example of Homology and similarity tool?
    a. BLAST
    b. RasMol
    c. EMBOSS
    d. PROSPECT

16. In which year did the SWISSPROT protein sequence database begin?
    a. 1988
    b. 1985
    c. 1986
    d. 1987

17. Which of the following scientists created the first Bioinformatics database?
    a. J.D. Watson
    b. Richard Durbin
    c. Margaret Dayhoff
    d. Michael J. Dunn

18. Which of the following are not the applications of bioinformatics?
    a. Drug designing
    b. Data storage and management
    c. Understand the relationship between organism
    d. None of the above

19. All are sequence alignment tools except:
    a. Rasmol
    b. BLAST
    c. FASTA
    d. Clustal W

20. Alignment method suitable for aligning closely related sequence is:
    a. Multiple sequence alignment
    b. Pairwise alignment
    c. Global alignment
    d. Local alignment

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Descriptive

Time : 2 hr. 30 mins. Marks : 50

[Answer question no.1 & any four (4) from the rest]

1. Define BLAST. Describe briefly the process involved in BLAST analysis and how to interpret the BLAST output. 2+4+4=10

2. a) What do you mean by MUX? Design the logic circuit of 4:1 MUX with the help of truth table. 7+3=10
   b) Subtract $(15)_{10}$ from $(9)_{10}$ in 2's compliment method.

3. a) Explain with the help of block diagram the architecture of Computer. 6+4=10
   b) Write short notes on Half Adder.

4. a) Define Universal gate. Realize an OR gate using NAND gate only. 4+6=10
   b) Discuss the features, advantages and disadvantages of generation of computer.

5. Explain descriptive statistics and inferential statistics. Write the importance of statistics in Biological science. 4+6=10

6. Find the mean, median, mode, standard deviation and coefficient of variation of the following distribution: 5×2=10
   Class :10 - 14 15 - 19 20 - 24 25 - 29 30 - 34
   Frequency: 4 6 8 2 1

7. If the heights of 500 students are normally distributed with mean 68.0 inches and standard deviation 3.0 inches, how many students have height 3+3+4=10
   (i) Greater than 72 inches
   (ii) Less than 64 inches
   (iii) Between 65 and 71 inches
   [Given, Z = 1.33, 1; A = 0.9082, 0.8413]

8. The mean of two samples of sizes 150 and 200 are respectively 67.5 and 68. Their respective standard deviations are 3 and 2.5. Is there significant difference between the two means at 5% level of significance? [Critical value of the test statistics at 5% level of significance, is 1.96] 10

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