M.Sc. BIOTECHNOLOGY
THIRD SEMESTER
BIOSTATISTICS, BIOINFORMATICS & IPR
MBT-301

Duration: 3 Hrs.   Marks: 70

PART : A (OBJECTIVE) = 20
PART : B (DESCRIPTIVE) = 50

[PART-B : Descriptive]

Duration: 2 Hrs. 40 Mins.   Marks: 50

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

1. (A) The following distribution gives the pattern of overtime work done by   (5+5=10)
   100 employees of a company. Calculate mean for overtime work done
   by per employee.

Overtime hours	10-15	15-20	20-25	25-30	30-35	35-40
Number of employees	11	20	35	20	8	6

   (B) Average weight of 100 screws in box 'A' is 10.4 gm. It is mixed with
   150 screws of box 'B'. Average weight of mixed screws is 10.9 gm. Find
   the average weight of screws of box 'B'.

2. Define conditional probability. A box contains five red and four blue   (2+8=10)
   similar shaped balls. Two balls are drawn at random from the box. Find
   the probability that both of them are red if:
   I. The balls are drawn together.
   II. The balls are drawn one after the other, with replacement.
   III. The balls are drawn one after the other, without replacement.

3. What is the χ^2–test of goodness of fit? According to a theory in Genetics ,   (2+8=10)
   the proportion of beans of A,B,C and D types in a generation should be
   9:3:3:1.In an experiment with 1600 beans, the frequency of bean of A,B,C
   and D type was observed to be 882,313,287,and 118 respectively. Does the
   result support the theory?
   (Given, χ^2_{tab} at 5 % level of significance = 7.81)

4. What do you mean by IPR? Explain the different forms of Intellectual   (4+6=10)
   Property Right protection.

5. Briefly explain The Indian Patent Act giving emphasis on Indian Patent   (10)
   Act 1970.

6. Write short notes on: (any two)   (5+5=10)
   a. Plant Breeders Right.
   b. TRIP's.
   c. WIPO.

7. What do you understand by biological database? Explain how you will align a given sequence in a database and determine its sequence similarities. Which databases will you use for this purpose? (2+6+2=10)

8. What is in-silico drug designing? Which software's will you use for drug designing? Explain any one. (2+3+5=10)

==**==

UNIVERSITY OF SCIENCE & TECHNOLOGY, MEGHALAYA

[PART (A) : OBJECTIVE]

Duration : 20 Minutes

Serial no. of the
main Answer sheet

Course : ....

Semester : .... Roll No : ....

Enrollment No : .... Course code : ....

Course Title : ....

Session : .... **2017-18** .... Date : ....

****

Full Marks	Marks Obtained
20	

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

M.Sc. BIOTECHNOLOGY
THIRD SEMESTER
BIOSTATISTICS, BIOINFORMATICS & IPR
MBT-301

[PART-A : Objective]

1. Choose the correct answer from the following: $1\times20=20$

1. Different methods give different averages which are known as the:
   a. Measures of central tendency.
   b. Statistics.
   c. Measures of dispersion.
   d. Skewness.

2. If the values of the variables are arranged in ascending order of magnitude, the middle term is:
   a. Mean
   b. Mode
   c. Median
   d. Quartile

3. If P(A)=2/3, P(B) = 1/3 & P(A∩B) = 1/5, then P (AUB)=?
   a. 4/5
   b. 3/5
   c. 2/5
   d. 1/5

4. The value of correlation coefficient lies between:
   a. -1 to +1
   b. 0 to 1
   c. -1 to 0
   d. None of the above

5. If the relationship between x and y is positive, as variable y decreases, variable x:
   a. Decreases.
   b. Increases.
   c. Remain same.
   d. None of the above.

6. If $\mu=30.5$, n=100 , $\bar{x}$ = 28.8 and σ = 8.35, then IzI equal to:
   a. 2.03
   b. 1.98
   c. 2.4
   d. 2.68

7. The symmetry of the normal distribution about its mean indicates that:
   a. The distribution is bell- shaped.
   b. The area under the curve on both sides of the mean is equal.
   c. The two tails extend indefinitely on either sides of the mean.
   d. All of the above.

8. If the two outcomes A and B of an experiment are independent where P(A)=0.4 and P(A∩B)= 0.7,then P(B) is:
   a. 0.5
   b. 0.3
   c. 4/7
   d. 2/7

9. A binomial distribution may be approximated by a Poisson distribution provided:
   a. P is large and n is small.
   b. P is small and n is large.
   c. P is large and n is small.
   d. None of the above.

10. A null hypothesis is accepted when:
    a. $\chi^2_{cal} \leq \chi^2_{tab}$
    b. $\chi^2_{cal} \geq \chi^2_{tab}$
    c. $\chi^2_{cal} = \chi^2_{tab}$
    d. None of the above

11. Which of the biological inventions is patentable?
    a. The products.
    b. Biological process.
    c. Composition of products.
    d. All of the above.

12. All of the following a protein database except:
    a. PIR
    b. SWISS PROT
    c. PSD
    d. None of the above

13. Application of bioinformatics include:
    a. Data storage and management.
    b. Drug designing.
    c. Understand relationships between organisms.
    d. All of the above.

14. Information retrieval tool of NCBI GenBank is:
    a. Entrez   b. STAG
    c. SeqIn   d. Text search

15. The Indian Patent Act 1970 allows the process patent for a maximum time of how many years from the date of grant?
    a. 5 Years
    b. 10 Years
    c. 15 Years
    d. 20 Years

16. An identification symbol or distinctive word applied to a product is called:
    a. Patent
    b. Trademark
    c. Copyrights
    d. Trade secrets

17. Which office grants patent?
    a. Registrar of Patents.
    b. Attorney General.
    c. Controller of patents.
    d. High court.

18. Which is the main component of international cooperation for intellectual property?
    a. TRIPs
    b. WTO
    c. WHO
    d. WIPO

19. Which of the following is one of the oldest conventions for protection of industrial property?
    a. Strasbourg convention
    b. Budapest Treaty
    c. Paris Convention
    d. PCT

20. A novel product discovered in an organism is:
    a. Unpatentable
    b. Patentable
    c. Uninventable
    d. Inventable

= = ** = =