

**T. Y. B. Sc. (Biotechnology) SEM – V (CBCS - 2015 COURSE) :
WINTER - 2018**

SUBJECT: BIOSTATISTICS

Day: Monday
Date: 22/10/2018

W-2018-1182

Time: 10.00 AM TO 01.00 PM
Max. Marks: 60

N.B:

- 1) **Q. No.1 and Q. No.5** are **COMPULSORY**. Out of the remaining attempt **ANY TWO** from each section.
- 2) Answer to the two sections should be written in **SEPARATE** answer books.
- 3) Figures to the right indicate **FULL** marks.
- 3) Use of non-programmable **CALCULATOR** is allowed.

SECTION-I

- Q.1 a)** Complete the frequency table given below which has many missing entries. **(05)**

S. No.	Observation (x)	Frequency (f)	Cumulative freq (cf)	Relative frequency (r)
1	1.20	3	-	-
2	1.30	6	-	-
3	1.40	-	19	-
4	1.50	3	22	-
5	1.60	1	-	-

- b)** Using the above tabular data find mode and median. Also draw a Histogram. **(05)**

- Q.2** Patients with knee-joint pain were subjected a treatment for about 4 months. Their pain, movement constraints were recorded (in scale 0-100) by the hospital before and after the treatment. Scores were as under. **(10)**

Patient ID	1	2	3	4	5	6	7	8	9
Score before	30	45	34	45	67	56	23	45	44
Score after	50	65	35	44	78	39	39	56	57

Patient ID	10	11	12	13	14	15	16	17
Score before	51	65	64	47	48	51	53	59
Score after	67	67	68	65	66	76	80	81

Determine if the Scores after are better than score before, using Paired t –test (Note: A score of 100 indicated good condition and a score of 0 indicates worst condition) Table value of $t = 2.12$ at 16 df.

- Q.3** Following ANOVA table is incomplete. Complete it by filling appropriate values in places indicated with? Tehn answer the questions that follow. **(10)**

Source of variation	Df	SS	MSS	F-value
Treat	(6-1) = 5	98.35	?	?
Error	?	?	?	
Total	(24-1) = 23	123.45		

P.T.O.

Find the following values:

No of Replications = _____,

No of Treatments = _____

Name of the Design = { CRD or RBD } = _____

- Q.4** a) Give examples of sets and illustrate basic operations of Union, Intersection, Complements. **(05)**
- b) A garden has performed budding on 10 plants and he knows that probability of success of each bud is only 0.4. This is an instance of Binomial experimentation. Answer the following. **(05)**
- What are values n, p and q
 - Estimate p (r = 3) and p (r > 8), where r is the number of successes.

SECTION-II

- Q.5** Compute the correlation coefficient (r), regression coefficient (b) and intercept using following data. **(10)**

Humidity %	45	47	50	52	57	70	72	75	76	78
Temp C ⁰	35	32	56.8	59.3	60.5	62.7	63.5	63.9	64	64.2

Draw a scatter diagram and write the linear equation of humidity on temperature on the graph, along with r-value

- Q.6** A survey was conducted on to determine the association between diabetic management and the type of occupation of individuals in IT service. The data obtained was **(10)**

	Project Managers	Software Developers	Document Writers	Support Engineers
Well Managed	10	15	23	8
Fairly Managed	15	10	10	12
Bad Management	20	10	12	21

Use chi-sq test to determine the dependency
(Table value of ch-sq 12.59 at 6 df)

- Q.7** Write short notes on **(ANY TWO)**: **(10)**
- Advantages of using a spread sheet for statistical analysis
 - The SPSS package.
 - Gaussian Distribution
- Q.8** Give examples of sets. Use them to explain the basis set operations and their properties. **(10)**