

**F.Y.B.PHARM. SEMESTER-I (2011 COURSE) : SUMMER - 2018**  
**SUBJECT: PHARMACEUTICAL STATISTICS**

Day: **Saturday**  
Date: **05/05/2018**

**S-2018-3944**

Time: **10.00 AM TO 01.00 PM**  
Max. Marks: **80**

**N.B.;**

- 1) **Q. No. 1 and Q. No. 5 are COMPULSORY.** Out of the remaining solve any **TWO** questions from each section.
- 2) Both the sections should be written in **SEPARATE** answer books.
- 3) Figures to the right indicate **FULL** marks.
- 4) Use of Non-programmable electronic pocket calculator is permissible.
- 5) Statistical Tables and Graph Papers will be provided at the examination centre.

**SECTION - I**

**Q.1** Attempt **ANY FIVE** of the following: **(10)**

- a) Explain the concept of measure of central tendency.
- b) Check whether the following function is probability mass function.  
$$P(x) = \frac{1}{10}, x = 1, 2, \dots, 10.$$
- c) If  $X \sim B(n, p)$  with  $E(X) = 20$  and  $V \text{ar}(X) = 16$ , find  $p$  and  $n$ .
- d) What are different types of correlation? Explain.
- e) If  $A$  and  $B$  are two events defined on  $\Omega$  with  $P(A) = 0.4$ ,  $P(B) = 0.5$ ,  $P(A \cap B) = 0.3$  Find,  $P(A')$  and  $P(A \cup B)$ .
- f) A random variable  $X$  has following probability distribution.

X	1	2	3	4	5	6
P(x)	1/36	3/36	5/36	7/36	9/36	11/36

Find  $E(X)$ .

**Q.2** Find the correlation coefficient, the coefficient of determination to the following data. Also fit the linear trend  $Y = a + bX$  to this data. **(15)**

Fat intake (gm) (X)	100	120	130	160	180	200	240
Weight (kg) (Y)	62	64	68	72	80	90	94

**Q.3** a) The frequency distribution of 189 patients according to their age is given below: **(07)**

Age	30-40	40-50	50-60	60-70	70-80	80-90
No. of Patients	11	46	70	45	16	1

Draw a histogram to the above data and find mode from it.

- b) In a study, the Poisson distribution was used to model the number of patients per month referred to an oncologist. The researcher use a average rate of 5 patients per week that are referred to the oncologist. Find the probability that in a week.  
  - i) Exactly 2 patients are referred to an oncologist.
  - ii) Between 1 to 3 (including both) are referred to an oncologist.
  - iii) No patient is referred to an oncologist.

**P.T.O.**

- Q.4 a)** The data for measurements of the left ischial tuberosity ( in mm Hg) for the spinal cord injury (SCI) are given below. (08)  
 60, 150, 130, 180, 163, 130, 121, 119, 130, 148  
 Find:  
 i) Mean left ischial tuberosity.  
 ii) Median left ischial tuberosity  
 iii) Variance of left ischial tuberosity.  
**b)** Given the normally distributed population with a mean of 75 and a variance of 625, find : (07)  
 i)  $P(50 < X < 100)$  ii)  $P(X < 75)$ .

**SECTION - II**

- Q.5** Solve ANY FIVE of the following: (10)
- Define 'Sample' and 'Population'.
  - What is the Degree of freedom (d.f.) in respect of a 2X2 contingency Table?
  - Distinguish: Parameter versus Statistics.
  - Explain completely Randomized Design
  - What are the disadvantages of using the 'Cross -Over Design'?
  - When do we use C - chart.
- Q.6 a)** The manufacturer of the lamps used in the operation theatre claims that the mean life of the lamps is 8400 hrs with a S.D. of 250hrs. When 100 such lamps are checked it showed the mean life of 8300 hrs. Can you justify the manufacturer's claims? (Use 5% L.O.S.) (08)
- b)** As per the hypothesis in the blood groups A, B, AB and O the individuals are in the ratio 3 : 2 : 5 when a group was tested it showed 73 in A group 56 in B group, 47 in AB group and 14 in O group. Does it support the hypothesis? (Use 5% L.O.S.). (07)
- Q.7 a)** Following data shows the effect of the use of a drug for the recovery from a disease in a stipulated time. (08)

	Use of new Drug	Use of the conventional Drug
Recovered	82	68
Not recovered	18	32

- Would you recommend the use of the new drug. (Use 5% L.O.S.).
- b)** Number of patients admitted to the two hospitals A and B during a week are as below: (07)

	No. of Patients Admitted						
	Mon	Tue	Wed	Thur	Fri	Sat	Sun
A	35	45	63	57	44	39	27
B	32	49	57	51	42	43	22

Indicate using the sign test whether the number of patients admitted to both the hospital is significantly different.

- Q.8 a)** Explain in details the term 'Statistical Quality Control (S.Q.C.)' with the various charts. (08)
- b)** Describe 'Tests of Inference' and Hypothesis'. (07)

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