

PART B — (5 × 16 = 80 marks)

11. (a) (i) State and prove the Baye's theorem. (6)
- (ii) A can solve 90 per cent of the problems given in a book and 'B' can solve 70 per cent. What is the probability that at least one of them will solve a problem selected at random? (6)
- (iii) In a single throw of two dice, what is the probability of obtaining a total of atleast 10? (4)

Or

- (b) The following table shows the number of customers returning the products in a marketing territory. The data is for 100 stores :

No. of returns :	0	1	2	3	4	5	6
No. of stores :	4	14	23	23	18	9	9

Fit a Poisson distribution.

12. (a) (i) Explain various approaches to probability. (6)
- (ii) In a sample of 300 units of a manufactured product, 65 units were found to be defective and in another sample of 200 units, there were 35 defectives. Is there significance difference in the proportion of defective in the samples at the 5 per cent level of significance. (10)

Or

- (b) (i) Write about central limit theorem and its applications. (6)
- (ii) A random sample of size 16 has 53 as mean. The sum of the squares of the deviations taken from mean is 135. Can this sample be regarded as taken from the population having 56 as mean? Obtain 95% and 99% confidence limits of the mean of the population. (10)

13. (a) (i) Based on information on 1,000 randomly selected fields about the tendency status of the cultivators of these fields and use of fertilizers collected in an agro economic survey, the following classification was noted :

	Owned	Rented
Using fertilizers	416	184
Not using fertilizers	64	336

Would you conclude that owner cultivators are more inclined towards the use of fertilizers at 5% level? (10)

- (ii) Explain the procedure of testing hypothesis. (6)

Or

- (b) The following table gives the performance of five sales person in four jobs are given in number of units.

Employees	Jobs			
	A	B	C	D
1	16	14	19	20
2	20	23	11	27
3	26	24	19	23
4	12	29	17	21
5	21	25	20	13

Test whether the mean performance of these jobs differ significantly.

14. (a) (i) Write about limitations of non-parametric tests. (4)
 (ii) The following is an arrangement of 25 men (M) and 15 women (W) lined up to purchase tickets for a premier picture show :

M WWMMM WMM W MW M WWW M MMW
 MM WWW MMMMMM WWW MMMMMM

Test for randomness at the 5 per cent level of significance.

Or

- (b) A company's trainees are randomly assigned to groups which are taught a certain industrial inspection procedure by three different methods. At the end of the instructing period they are tested for inspection performance quality. The following are their scores :

Method A : 80, 83, 79, 85, 90, 68
 Method B : 82, 84, 60, 72, 86, 67, 91
 Method C : 93, 65, 77, 78, 88.

Comment this data by using suitable non parametric test.

15. (a) Below are given the annual production in thousand tonnes of fertilizers factory :

Year :	1997	1998	1999	2000	2001	2002	2003
Production :	70	75	90	91	95	98	100

- (i) Fit a straight line trend by the method of least squares and tabulate the trend values.
 (ii) Convert annual trend equation into a monthly trend equation.

Or

- (b) The following data give the experience of machine operators and their performance ratings as given by the number of goods parts turned out per 100 pieces.

Operator :	1	2	3	4	5	6	7	8
Experience :	16	12	18	4	3	10	5	12
Performance rating :	87	88	89	68	78	80	75	83

Obtain the regression line of performance ratings on experience and estimate the probable performance if an operator has 9 years experience.

