Reg. No. : ....

Code No. : 8940   Sub. Code : PKCM 12

M.Com. (CBCS) DEGREE EXAMINATION,
APRIL 2018.

First Semester

Commerce

ADVANCED BUSINESS STATISTICS

(For those who joined in July 2017 onwards)

Time : Three hours   Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer:

1. In a probability distribution, mean equal to zero and S.D equal to one is

   (a) Binominal distribution

   (b) Poisson distribution

   (c) Normal distribution

   (d) Standard normal distribution

2. The variance of a Binomial distribution is

   (a) np (b) npq

   (c) $\sqrt{np}$ (d) $\sqrt{npq}$

3. The test statistic to test $\mu_1 = \mu_2$ for normal population is

   (a) F – test   (b) Z test

   (c) T test   (d) None of these

4. If we reject the null hypothesis which is correct is a

   (a) Type I error   (b) Type II error

   (c) Either (a) or (b)   (d) Correct decision

5. Which of the following is a parametric test?

   (a) Chi square   (b) Sign test

   (c) U test   (d) Z test

6. Entries into the cells of a contingency table should be

   (a) frequencies   (b) mean values

   (c) percentage   (d) df

7. A type of decision making environment is

   (a) certainty   (b) uncertainty

   (c) risk   (d) all the above

8. The concept of Utility is used to

    (a) measure the utility of money

    (b) take into account aversion of risk

    (c) both (a) and (b)

    (d) none of the above

9. Control charts for attributes are

    (a) P - charts   (b) $\overline{C}$ - charts

    (c) R - charts   (d) $\overline{X}$ - charts

10. A measure of the performance of an acceptance sampling plan is

    (a) Producer's risk   (b) Consumer's risk

    (c) OC curve   (d) None of these

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

11. (a) Assume the mean height of soldiers to be 68.22 inches with a variance of 10.8 inches. How many soldiers in a regiment of 1,000 would you expect to be over six feet tall? (normal table value is 0.1251).

Or

    (b) Out of 320families with 5 children each, what percentage would be expected to have 2 boys and 3 girls?

12. (a) If a coin is tossed 20 times, what is the probability that the number of times getting heads is less than or equal to 12?

Or

    (b) A Auditor claims that 10% of customer's ledger accounts are carrying mistakes of posting and balancing. A random sample of 600 was taken to test the accuracy of posting and balancing and mistake were found. Are these sample results consistent with the claim of the auditor? Use 5% level of significance. (table value 1.96).

13. (a) The number of bike accidents per week in a certain town were as follows.

    12 8 20 2 14 10 15 6 9 4

    Are these frequencies in agreement with the belief that accident conditions were the same during the 10 week period? (critical value for chi-square test I 16.819)

Or

    (b) What are the disadvantages of non-parametric tests?

14. (a) Write about various types of decision making environment.

Or

(b) Explain the various quantitative methods which are useful for decision making under uncertainty?

15. (a) Explain the term statistics quality control and its advantages.

Or

(b) Define the term producers risk and consumer risk.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b).

16. (a) The life times of certain kinds of electronic devices have a mean of 300 hours and S.D of 25 hrs. Assume which is normally distributed.

(i) Find the probability that any one of these electronic devices will have a life time opf more than 350 hours.

(ii) What percentage will have life times of 300 hours or less?

(table value 0.9772)

Or

(b) The following tables shows the number of customer 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. ($e = 2.7183$)

17. (a) 9 students were given intensive coaching and 5 tests were conducted in a month. The scores of tests 1 and 5 are given below. Does the scores from the 1 to 5 show an improvement?

Student:	1	2	3	4	5	6	7	8	9
Marks in I test:	75	70	46	68	68	43	55	68	77
Marks in V test:	70	77	57	60	79	64	55	77	76

(Table value 2.31)

Or

(b) The following figures related to the number of units of a product sold in five different areas by four salesmen.

Number of units

Area	A	B	C	D
1	80	100	95	70
2	82	110	90	75
3	88	105	100	82
4	85	115	105	88
5	75	90	80	65

Is there a significance difference in the efficiency of these salesmen? (Table value = 3.24)

18. (a) A brand manager is concerned that his brand's share may be unevenly distributed throughout the country. In a survey in which the country was divided into geographical regions a random sampling of 100 consumers in each region was surveyed with the following results: Apply chi square test.

Region

	E	W	S	N
Purchase the brand	40	55	45	50
Do not purchase	60	45	55	50

(Chi square table value 7.815)

Or

(b) Three groups of employees underwent training. After training the employees were given a test their scores are shown below. Apply Krushal – Wallis test to findout whether there was difference in the effectiveness of training methods. (Table value 5.991)

Training methods	Score
A	75 83 68 85 90 61 –
B	62 70 67 82 80 87 64
C	65 71 74 63 89 – –

19. (a) The following table gives the number of defects observed in 7 carpets passed as satisfactory. Construct the control chart for the number of defects.

No. of carpet	1	2	3	4	5	6	7
No. of defects	2	3	5	4	5	4	5

Or

(b) What is TQM and discuss about Fishbone and Pareto diagrams technique?

20. (a) What are the advantages and limitations of the decision tree analysis?

Or

(b) Calculate expected opportunity loss from the following payoff tables.

Event	Action			Event probabilities
	A1	A2	A3	
E1	50	–10	–80	0.2
E2	400	500	600	0.5
E3	600	900	800	0.3