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Reg. No. : .....

Code No. : 5651

Sub. Code : ZBAM 14

M.B.A. (CBCS) DEGREE EXAMINATION,  
NOVEMBER 2022.

First Semester

Business Administration — Core

QUANTITATIVE TECHNIQUES

(For those who joined in July 2021 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. A function  $f : A \rightarrow B$  is \_\_\_\_\_ if  $f(A) = B$   
(a) onto (b) one-one  
(c) sequence (d) series
2. The second derivative of  $3x^2$  is \_\_\_\_\_  
(a)  $6x$  (b) 6  
(c)  $3x$  (d)  $5x$

3. The contribution of various components in a system is represented by a circle then it is called — \_\_\_\_\_ chart

- (a) line (b) bar  
(c) pie (d) histogram

4. The variance of the binomial distribution is \_\_\_\_\_

- (a)  $npq$  (b)  $np$   
(c)  $p(1-p)$  (d)  $1-p$

5. The mean of the Poisson distribution is \_\_\_\_\_

- (a)  $m+1$  (b)  $npq$   
(c)  $m$  (d)  $1-p$

6. The hypothesis is false but our test accept, then it is called \_\_\_\_\_ error

- (a) Type II (b) Type  
(c) Type III (d) Type IV

7. The change in two variables in opposite direction is called \_\_\_\_\_ correlation

- (a) positive (b) skewed  
(c) negative (d) kurtosis

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8. The technique of testing the significance of the difference of two or more means is called \_\_\_\_\_

- (a) ANOVA (b) correlation  
(c) test of significance (d) none

9. The \_\_\_\_\_ index measures change in total monetary worth.

- (a) value (b) under  
(c) index (d) time series

10. The quantitative method used to determine patterns in data collected over time is called \_\_\_\_\_

- (a) probability (b) index  
(c) time series (d) data collection

PART B — (5 × 5 = 25 marks)

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

11. (a) Find the elasticity of supply function  $x = 2p^2 + 5$ .

Or

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(b) Find the product of the matrices A and B if

$$A = \begin{pmatrix} 3 & 1 \\ 2 & 4 \\ 7 & 4 \end{pmatrix} \text{ and } B = \begin{pmatrix} 8 & 0 & 5 \\ 3 & 2 & 1 \end{pmatrix}.$$

12. (a) Determine the probability of drawing either an ace or a heart in a well shuffled deck of playing cards.

Or

(b) A hundred companies in a state declared dividend as given below. Calculate the variance assume that the company declares 8% dividend falls in class 8-16.

|                    |     |      |       |       |       |
|--------------------|-----|------|-------|-------|-------|
| Dividend :         | 0-8 | 8-16 | 16-24 | 24-32 | 32-40 |
| No. of companies : | 30  | 60   | 80    | 20    | 10    |

13. (a) A book containing 100 misprints distributed randomly through out its 100 pages. What is the probability that a page observed at random contains atleast 2 misprints?

Or

(b) The mean of a binomial distribution is 4 and s.d is  $\sqrt{3}$  then calculate n, p and q.

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[P.T.O.]





14. (a) Discuss about steps involved in ANOVA.

Or

- (b) A company got the following figure from its past records. Find the regression line of Y on X. What is the estimated revenue when 9 lakhs is spent on a day

X Amount spend : 3 4 4 6 8

Y revenue : 4 5 6 8 10

15. (a) Write about four kinds of variation in time series.

Or

- (b) Write about types of index numbers.

PART C — (5 × 8 = 40 marks)

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

16. (a) Find the inverse of the matrix  $\begin{pmatrix} 1 & 1 & 1 \\ 1 & 2 & -3 \\ 2 & -1 & 3 \end{pmatrix}$ .

Or

- (b) Find the maxima and minima for the function  $y = 2x^3 + 3x^2 - 36x + 16$ .

17. (a) Assume that we have one box containing 10 balls distributed as follows :

Three are coloured and dotted.

One is coloured and striped.

Two are Gray and dotted.

Four are Gray and striped. Suppose someone draws a coloured ball from the box. What is the probability that it is dotted? What is the probability it is striped?

Or

- (b) Calculate the mean deviation about mean for the data 12, 23, 80, 35, 43, 72, 59, 100, 53, 133.

18. (a) From a box containing 100 transistors in which 20 are defective and suppose 10 are selected from that box then find the probability that

(i) all 10 are good

(ii) all 10 are defective

(iii) at most 3 are defective

(iv) at least one is defective

Or

- (b) Explain the steps involved in testing of hypothesis.





19. (a) Calculate the rank correlation coefficient for the following data of ranks of two tests given to the candidates for Maths and Statistics for Managers.

Test I : 92 89 87 86 83 77 71

Test II : 86 83 91 77 68 85 52

Test I : 63 53 50

Test II : 82 37 57

Or

- (b) The following data relate to marks obtained by 250 students in Maths and Science. The coefficient of correlation between marks in the subjects is +.8 Find the two regression equation and estimate the marks obtained by a student in Science who secured 50 marks in Maths

| Subject | Average | S.d |
|---------|---------|-----|
| Maths   | 48      | 4   |
| Science | 55      | 5   |

20. (a) Explain cyclical variation with suitable example.

Or

- (b) Calculate the index numbers keeping 1980 as base year

| Year   | 1980 | 1985 | 1990 | 1995 |
|--------|------|------|------|------|
| Number | 9.3  | 6.5  | 9.6  | 10.1 |

