B.M.S COLLEGE FOR WOMEN AUTONOMOUS
BENGALURU – 560004
SEMESTER END EXAMINATION – SEPTEMBER 2023

B.Com. – Business Data Analytics – 2ⁿᵈ Semester

BUSINESS STATISTICS-2
(NEP Scheme 2021-22 Onwards F+R)

Course Code: BBDA2DSC05   **QP Code: 2041**
Duration: 2 ½ Hours   **Max. Marks: 60**

Instructions: 1. Simple/Scientific calculator may be used.
2. Graphs sheets and Statistical tables will be supplied on request.

SECTION-A

1. Answer any FIVE of the following questions. Each question carries TWO Marks.   (5X2=10)

a. What is regression analysis? Point out its usefulness in dealing with business problems.

b. Define the terms: (i) mutually exclusive events (ii) exhaustive events

c. In a certain college, the students engage in various sports in the following proportions:

       Football: 60% of all students

       Basketball:50% of all students

       Both football and basketball:30% of all students.

       If a student is selected at random, what is the probability that she will play football or basketball?

d. A purchaser receives articles in large batches and he wants to know the sample size he should use in order to obtain a satisfactory estimate of mean for each batch. One batch was exhaustively examined and yielded a distribution with standard deviation 2.85. The purchaser considered satisfactory the mean with E=0.24 and Z=1.96. Find the sample size?

e. State "Central limit theorem".

f. What is Interpolation? What are its uses?

Year	2019	2020	2021	2022	2023
Production (in tonnes)	13	-	28	36	44

g. Find the missing figure for the following data by using Binomial expansion method.

SECTION- B

Answer any FOUR of the following questions. Each question carries FIVE Marks. (4X5=20)

1. The following table gives the annual sales (in '0000) of a commodity. Determine the trend values by using 5 yearly moving averages.

Year	2016	2017	2018	2019	2020	2021	2022	2023
Sales	55	63	76	89	91	110	143	155

2. There are two sections A and B in Statistics paper at a C.A. intermediate examination. The probability that a candidate passes in section A is 0.6 and that he passes in section B is 0.3. What is the probability that a particular candidate passed only in any one of the two sections?

3. (a) Define the terms: (i) Sample (ii) Sampling distribution
    (b) Write any two utilities (uses) of Standard error.

4. An Accountant is to audit 24 accounts of a firm. 16 of these are of highly- valued customers. If the accountant selects 4 of the accounts at random, what is the probability that he chooses (a) none of the highly- valued account (b) at least one highly- valued account? Use Binomial distribution to obtain the required probabilities.

5. Estimate the expectation of life at the age of 16 years by using the following data. Apply Newton's forward difference method for the estimation.

Age (in years)	10	15	20	25	30	35
Expectancy of life (in years)	35.4	32.3	29.2	26.0	23.2	16.4

SECTION- C

Answer any TWO of the following questions. Each question carries TWELVE Marks. (2X12=24)

6. From the data given below find
    (a) The two regression coefficients.
    (b) The regression equation of X on Y.
    (c) The regression equation of Y on X.
    (d) The most likely value of Y when X=70

X	25	28	35	32	31	36	29	38	34	32
Y	43	46	49	41	36	32	31	30	33	39

7. (a) What is sampling? Write any two objectives of sampling.
    (b) State and explain the "Law of Statistical regularity" and "Principle of Inertia of large numbers".

8. (a) A project yields an average cash flow of Rs. 500 lakhs with a standard deviation of Rs. 50 lakhs. Calculate the following probabilities assuming the Normal distribution:

   (i) Cash flow will be more than Rs. 550.
   (ii) Cash flow will be less than Rs. 440.
   (iii) Cash flow will be between Rs. 450 and Rs. 530 lakhs.

   (b) If a random variable X follows Poisson distribution such that $P(X=1)=P(X=2)$, find

   (i) The mean and variance of the distribution.
   (ii) $P(X=0)$.

SECTION- D

Answer any ONE of the following questions. Each question carries SIX Marks.   (1X6= 6)

9. You are given the exports (in crores) of electronic goods from 2019 to 2023. Assuming the below time series data to follow linear trend, fit a trend of the type $Y=a+bX$ and estimate the exports for the year 2025.

Year	2019	2020	2021	2022	2023
Exports	53	65	62	64	72

10. The following table provides the information about the wages of 700 labourers. Estimate the number of labourers earning wages upto Rs. 450. (Use Newton's backward difference method for the estimation).

Wages/hour (in Rs.)	No. of labourers
Upto 100	50
Upto 200	150
Upto 300	300
Upto 400	500
Upto 500	700

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