# BM 01

**Note:** 1) Attempt any five questions
2) Figures to the right of the question indicates full marks
3) Statistical table will be provided on request

Q.1 A) Define the Following terms with an example (4)
    i. Variate
    ii. Attibute
    iii. Cumulative Frequency
    iv. Relative Frequency

Q.1 B) Find the Mean deviation from Median and its coefficient for the following Frequency (8)
Distribution

| Marks: | 0-10 | 10-20 | 20-30 | 30-40 | 40-50 |
|---|---|---|---|---|---|
| No. Of Students: | 10 | 20 | 35 | 25 | 10 |

Q.2 A) Explain the concept of Skewness. (4)

Q.2 B) The monthly profits in Rs. Of 100 shops are distributed as follows, (8)

| Profit / Shop : | 0-200 | 200-400 | 400-600 | 600-800 | 800-1000 | 1000-1200 |
|---|---|---|---|---|---|---|
| No. Of Shops: | 12 | 18 | 27 | 20 | 17 | 6 |

Calculate Karl Pearson's coefficient of Skewness & comment on it.

Q.3A) State the limits for correlation coefficient. What is regression? State the relationship (4)
between regression coefficients and correlation coefficient.

Q.3B) Calculate Spearman's rank correlation coefficient for the following data. (8)

| Marks in Economics | 43 | 29 | 35 | 18 | 40 | 11 | 49 | 10 | 40 | 22 |
|---|---|---|---|---|---|---|---|---|---|---|
| Marks in Maths | 36 | 6 | 17 | 14 | 25 | 10 | 32 | 4 | 14 | 20 |

Q.4A) State addition rule of probability for two events. Also mention the rule when events are (4)
mutually exclusive.

Q.4 B)In a shooting competition, the probability that A hits the target is ¼. If fires 5 times, (8)
what is the probability that he hits
    (i) exactly three times
    (ii) atleast one time

Q.5 A) Explain the terms. (6)
    i) Null Hypothesis
    ii) Level of Significance
    iii) Type I error and Type II error

Q.5 B)If a sample of size 20 was drawn from a normal population with mean 50 & S D 10. (6)
Test whether this sample is from the population with mean 40.

Q.6) Write short notes on any three. (12)
    i) Baye's Theorem in Probability
    ii) Applications Of Chi Square test
    iii) Large sample tests
    iv) Normal Distribution
    v) Negative Bionomial Distribution

Q.7) Solve any three. (12)
1) The mean wages of workers were calculated at Rs 8000 / month & S.D. was worked out
to be Rs. 2000/month . On the basis of this information obtain
    i. The Probability of workers getting salary between Rs 7000 & Rs 9000
    ii. The Probability of workers getting salary more than Rs 10000/-
    (Assume the distribution of salary to be normal)

2) For the following 2x2 Contingency table, test the independence of attributes
For 150 persons at 5% level.

|  | Intelligent | Not Intelligent |
| --- | --- | --- |
| Educated | 80 | 10 |
| Non Educated | 10 | 50 |

3) The means of two samples of sizes 1000 and 1200 are 68 and 70 respectively. Can they be regarded
as drawn from the same population with standard deviation 4?

4) A Consumer testing service, wishing to test the accuracy of the thermostats of three different kinds
of electric irons, set them at 480 degrees & obtained the following actual temperatures readings by
means of a thermocouple:
    Iron X:    474, 496, 467, 471
    Iron Y:    492, 498
    Iron Z:    460, 495, 490
Test the significans whether the differences among the three sample means can be attributed to chance
Use 5% level of significans.

5) A box contains 5 blue and 8 red green balls. If two balls are selected at random from this box, what
is the probability that (i) both blue and (ii) one blue and one green.

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