

**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI**  
**(END SEMESTER EXAMINATION)**

**CLASS: BBA**  
**BRANCH: BBA**

**SEMESTER: III**  
**SESSION: MO/2024**

**SUBJECT: MN206 QUANTITATIVE TECHNIQUES OF MANAGEMENT**

**TIME: 3 Hours**

**FULL MARKS: 50**

**INSTRUCTIONS:**

1. The question paper contains 5 questions each of 10 marks and total 50 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
4. Before attempting the question paper, be sure that you have got the correct question paper.
5. Standard Normal Curve, Chi-Square table etc. to be supplied to the candidates in the examination hall.

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|                     |   | CO        | BL               |                     |       |                     |       |                     |       |    |   |    |    |  |  |
|---------------------|---|-----------|------------------|---------------------|-------|---------------------|-------|---------------------|-------|----|---|----|----|--|--|
| Q.1(a)              | How is the probability distribution of a discrete random variable defined? Define its expected value.   | [5]       | 2    3           |                     |       |                     |       |                     |       |    |   |    |    |  |  |
| Q.1(b)              | In normal distribution 31% of the items are under 45 and 8% are above 64. Find mean and standard deviation of the distribution.   | [5]       | 3    5           |                     |       |                     |       |                     |       |    |   |    |    |  |  |
| Q.2(a)              | Fill up in the blanks   | [5]       | 3    4           |                     |       |                     |       |                     |       |    |   |    |    |  |  |
|                     | <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Limits</th> <th style="text-align: left;">Confidence Level</th> </tr> </thead> <tbody> <tr> <td>1.64 Standard Error</td> <td>.....</td> </tr> <tr> <td>1.96 Standard Error</td> <td>.....</td> </tr> <tr> <td>2.58 Standard Error</td> <td>.....</td> </tr> </tbody> </table>   | Limits    | Confidence Level | 1.64 Standard Error | ..... | 1.96 Standard Error | ..... | 2.58 Standard Error | ..... |    |   |    |    |  |  |
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| 1.64 Standard Error | .....   |           |                  |                     |       |                     |       |                     |       |    |   |    |    |  |  |
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| 2.58 Standard Error | .....   |           |                  |                     |       |                     |       |                     |       |    |   |    |    |  |  |
| Q.2(b)              | Briefly explain methods of Sampling with meaning, advantages and disadvantages.   | [5]       | 3    3           |                     |       |                     |       |                     |       |    |   |    |    |  |  |
| Q.3(a)              | The wages of group of 5000 workers were found to be normally distributed with mean of ₹800 and standard Deviation of ₹200. Estimate wages received by top 10 workers.   | [5]       | 4    5           |                     |       |                     |       |                     |       |    |   |    |    |  |  |
| Q.3(b)              | Distinguish between following:<br>1. large sample and small sample<br>2. point estimation and interval estimation   | [5]       | 2    3           |                     |       |                     |       |                     |       |    |   |    |    |  |  |
| Q.4(a)              | List practical steps involved in testing hypothesis.  | [5]       | 3    3           |                     |       |                     |       |                     |       |    |   |    |    |  |  |
| Q.4(b)              | In order to test whether the average weekly maintenance cost of a fleet of buses is more than ₹ 500, a random sample of 49 buses was taken. The mean and standard deviation found to be ₹ 506 and ₹ 42. Assume suitable level of significance.  | [5]       | 4    5           |                     |       |                     |       |                     |       |    |   |    |    |  |  |
| Q.5(a)              | Is Chi - Square Distribution Free Test? Mention Uses of Chi - Square Test.  | [5]       | 3    3           |                     |       |                     |       |                     |       |    |   |    |    |  |  |
| Q.5(b)              | A cigarette company interested in the effect of sex on the type of cigarette smoked has collected the following data from a random sample of 150 persons. Test whether the type of cigarette smoked and sex are independent.  | [5]       | 4    5           |                     |       |                     |       |                     |       |    |   |    |    |  |  |
|                     | <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Cigarette</th> <th style="text-align: left;">Male</th> <th style="text-align: left;">Female</th> </tr> </thead> <tbody> <tr> <td>A</td> <td style="text-align: center;">25</td> <td style="text-align: center;">30</td> </tr> <tr> <td>B</td> <td style="text-align: center;">40</td> <td style="text-align: center;">15</td> </tr> <tr> <td>C</td> <td style="text-align: center;">30</td> <td style="text-align: center;">10</td> </tr> </tbody> </table> | Cigarette | Male             | Female              | A     | 25                  | 30    | B                   | 40    | 15 | C | 30 | 10 |  |  |
| Cigarette           | Male  | Female    |                  |                     |       |                     |       |                     |       |    |   |    |    |  |  |
| A                   | 25  | 30        |                  |                     |       |                     |       |                     |       |    |   |    |    |  |  |
| B                   | 40  | 15        |                  |                     |       |                     |       |                     |       |    |   |    |    |  |  |
| C                   | 30  | 10        |                  |                     |       |                     |       |                     |       |    |   |    |    |  |  |