

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

**CLASS: MBA/PRE_PHD
BRANCH: MANAGEMENT**

**SEMESTER : I/NA
SESSION : MO/19**

SUBJECT: MT405 QUANTITATIVE TECHNIQUES IN 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. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.
6. GRAPH PAPERS WILL BE PROVIDED
7. STATISTICAL TABLES WILL BE PROVIDED

- Q.1(a) Define statistics. Discuss its application in the management of business enterprises. [5]
 Q.1(b) Draw the histogram and O give more than type for the following data pertaining to income distribution of 1500 employees. [5]

Monthly Income (Rs.)	No. of Employees	Monthly Income (Rs.)	No. of Employees
1800 - 2000	10	2800 - 3000	320
2000 - 2200	35	3000 - 3200	200
2200 - 2400	140	3200 - 3400	75
2400 - 2600	300	3400 - 3600	35
2600 - 2800	370	3600 - 3800	15

- Q.2(a) In an examination of 675 candidates the examiner supplied the following information: [5]

Marks Obtained	No. of Candidates	Marks Obtained	No. of Candidates
Less than 10%	7	Less than 50%	381
Less than 20%	39	Less than 60%	545
Less than 30%	95	Less than 70%	631
Less than 40%	201	Less than 80%	675

- Calculate the mode and median of the percentage marks obtained.
 Q.2(b) From the following frequency distribution of heights of 360 boys, calculate the arithmetic mean and coefficient of variation. [5]

Height (In cms)	No. of boys	Height (In cms)	No. of boys
126 - 130	31	146 - 150	60
131 - 135	44	151 - 155	55
136 - 140	48	156 - 160	43
141 - 145	51	161 - 165	28

- Q.3(a) What is business forecasting? Explain its importance in business decision making. [5]
 Q.3(b) In the following table are recorded data showing the test scores made by salesmen on an intelligence test and their weekly sales. [5]

Salesman	1	2	3	4	5	6	7	8	9	10
Test - Scores	45	75	50	60	80	90	85	40	80	55
Sales in Lakhs	2.0	6.5	3.5	5.0	4.5	6.0	6.5	2.5	5.5	4.5

Estimate the most probable weekly sales volume if a salesman makes a score of 70.

- Q.4(a) What is central limit theorem? Explain. [5]
 Q.4(b) Two electric light tubes of manufacturer A have a mean lifetime of 1400 hours with a standard deviation of 200 hours while those of manufacturer B have a mean lifeline of 1200 hours with a standard deviation of 100 hours. If a random sample of 125 tubes of each brand are tested, what is the probability that the brand A tubes will have a mean lifeline which is at least [5]
 (i) 160 Hours more than the brand B
 (ii) 250 Hours more than the brand B

- Q.5(a) Of the 1000 workers in a factory exposed to an epidemic, 700 in all were attacked. 400 had been inoculated and of these 200 were attacked. On the basis of this information, use chi - square test to determine that inoculation and attack are independent. [5]
 Q.5(b) What is 'Analysis of Variance' and where is it used? Give suitable examples. [5]