

MODEL QUESTION PAPER – SET 1
Business Statistics (20MBA14)

- Note: 1) Answer any 4 full questions from Q.No. 1 to Q.No. 7**
2) Part – B, Q.No. 8 is compulsory

Part – A

- 1) a. Explain the functions of statistics. **(3marks)**
b. Calculate Median, Upper quartiles, 3rd Decile from the following data: **(7 marks)**

Heights in Cm	145-150	150-155	155-160	160-165	165-170	170-175	175-180
No. of persons	2	4	12	22	30	25	10

- c. From the prices of X & Y of shares A & B respectively given below, state which share is more stable in value.
(10marks)

Price of Share A	55	54	52	53	56	58	52	50	51	49
Price of share B	108	107	105	105	106	107	104	103	104	101

- 2) a. What do you mean by correlation? Mention any four uses of it? **(3marks)**
b. Discuss the difference between Parametric and Non-Parametric tests? **(7 marks)**
c. Calculate Spearman's rank correlation co-efficient between advertisement cost and sales

from the following data

Advertisement cost('000 Rs)	39	65	62	90	82	75	25	98	36	78
Sales(lakhs Rs)	47	53	58	86	62	68	60	91	51	84

- 3) a. Explain the significance in measuring dispersion? **(3marks)**
b. In a bolt factory, machines A, B and C manufacture 25%, 35% and 40% respectively of the total. Of their output 5, 4 and 2 percent are known to be defective bolts. A bolt is drawn at random from the product and is found to be defective. What are the probabilities that it was manufactured by machines B or C? **(7marks)**
c. The following data related to the scores obtained 9 salesmen of a company in an intelligence test and their weekly sales in Rs ('000). **(10marks)**

Salesman	A	B	C	D	E	F	G	H	I
Test scores	50	60	50	60	80	50	80	40	70
Weekly sales	30	60	40	50	60	30	7	50	60

- (i) Obtain the regression equation of sales on intelligence test scores of the salesman.
(ii) If the intelligence test score of a salesman is 65, what would be his expected weekly sales?

- 4) a. What is Poisson's distribution? Mention 2 application of Poisson distribution. **(3marks)**
- b. calculate Rank Correlation co-efficient between marks assigned to 10 students by judges X & Y in a certain competitive test. **(7marks)**

Marks given by judge X	52	53	42	60	45	41	37	38	25	27
Marks given by judge Y	65	68	43	38	77	48	35	30	25	50

- c. (i) A cyclist pedals from his house to his college at a speed of 10 km/hr and back from college to his house at 15 km/hr. Find the average speed. **(5 marks)**
- (ii) If the A.M. of two observations is 127.5 & their G.M. is 60. Find (i) Their H.M. & (II) two observations. **(5 marks)**
- 5) a. What do you mean by correlation? Mention any four uses of it? **(3 marks)**
- b. The mean and standard deviation of a set of 100 observations were worked out as 40 and 5 respectively by a computer which by mistake took value 50 in place of 40 for one observation. Find the correct mean and standard deviation **(7 marks)**
- c. Goals scored by two teams A & B in a football season are given below. Find the more consistent team. **(10 marks)**

No. of goals	0	1	2	3	4	5
Team A	27	9	8	5	4	1
Team B	17	9	6	5	3	2

- 6) a. Define time series analysis? Mention the methods used for the study and measurement of trend in time series ? (3 marks)
- b. Explain the Procedure of hypothesis test described various stages involved. **(7 marks)**
- c. Mysuru Mahanagar Palike surveyed the travel preferences of people who travelled to work by train or bus. The initial analysis suggested that 1 in 5 people travelled by train to work. If 5 people are interviewed, what is the probability that,
- i) Exactly 3 prefer travelling by train
- ii) Three or more prefer travelling by train and
- iii) Less than 3 prefer travelling by train. **(10marks)**
- 7) a. What is hypothesis? Mention the types of hypothesis testing? (3 marks)
- b. From the following series of annual data, find the trend line by the method of semi-averages. Also estimate the value for 1999. **(7 marks)**

Year	1990	1991	1992	1993	1994	1995	1996	1997	1998
Actual value	170	231	261	267	278	302	299	298	340

c. Three products received the following performance ratings by a panel of 15 consumers.

Product		
A	B	C
50	80	60
62	95	45
75	98	30
48	87	58
65	90	57

Use the Kruskal-Wallis test and $\alpha = 0.05$ to determine whether there is a significant difference in the performance ratings for the products. **(10 marks)**

Part - B

8) a. A coaching centre claims that students will perform better in their exams after going through the coaching offered by their centre. The table given below shows the marks obtained by 6 students before and after the coaching course. Can you conclude that the students score has improved after the course with level of significance $\alpha = 0.05$?

Student	1	2	3	4	5	6
Marks (before)	85	96	70	76	81	78
Marks (after)	88	85	89	86	92	89

(10 marks)

b. The number of defects per unit in a sample of 330 units of manufactured product was given below. Fit a Poisson distribution to the data (Given $e^{-0.439} = 0.6447$)

No. of defects	0	1	2	3	4
No. of units	214	92	20	3	1

(10 marks)

MODEL QUESTION PAPER – SET 2
Business Statistics (20MBA14)

Note: 1) Answer any 4 full questions from Q.No. 1 to Q.No. 7

2) Part – B, Q.No. 8 is compulsory

Part – A

1. a. Mention the applications of statistics. (3marks)
b. Find the Mean & Standard Deviation from the following data: (10marks)

X	10	20	30	40	50	60	70	80
Y	15	30	53	75	100	110	115	125

(7 marks)

- c. Fit a straight line trend by the method of least squares and estimate the arrival in the year 2013, for the data indicated in the table below: (10marks)

Year	2003	2004	2005	2006	2007	2008	2009
Tourists arrivals	18	20	23	25	24	28	30

2. a. Discuss the advantages and limitations of Diagrams and Graphs. (3marks)
b. For a certain frequency table which has only been partly reproduced, here the Mean was found to be 1.46 . Calculate the missing frequencies.

No. of accidents	0	1	2	3	4	5	
No. of days	46	?	?	25	10	5	N=200

(7 marks)

- c. From the following data obtain the two regression equations. (10 marks)

Sales	91	97	108	121	67	124	51	73	111	57
purchase	71	75	69	97	70	91	39	61	80	47

3. a. Mention the rules of probability with formula. (3marks)

b. Discuss : (i) Type I & Type II errors (ii) Different methods of estimating trend (7marks)

- c. The table below represents the number of bounced cheques in two banks – Bank A and Bank B – on randomly chosen 12 days for Bank A and 15 days for Bank B. use a Mann-Whitney U test to examine at a 5 percent level of significance whether Bank A has more bounced cheques as compared to Bank B.

Bank A	42	65	38	55	71	60	47	59	68	57	76	42			
Bank B	22	17	35	19	8	24	42	14	28	17	10	15	20	45	50

(10 arks)

4. a. Define time series analysis? Mention the methods used for the study and measurement of trend in time series ?(3marks)

b. Explain the Procedure of hypothesis test described various stages involved. **(7 marks)**

c. A financial analyst wanted to find out whether inventory turnover influences any company's earning per share (in percentage). A random sample of 7 companies listed in a stock exchange were selected and following data was recorded for each:

Company	Inventory turnover(no. of times)	Earnings per share(percentage)
A	4	11
B	5	9
C	7	13
D	8	7
E	6	13
F	3	8
G	5	8

Using Spearman's rank correlation, find the strength of association between inventory turnover and earnings per share. Interpret the findings. **(10 marks)**

5. a. What is Poisson's distribution? Write a formula for probability function of Poisson's distributions. (3marks)

b. Discuss the difference between Parametric & Non Parametric tests. **(7 marks)**

c. From the following table calculate the Co-efficient of correlation by Karl Pearson's method,

X	6	2	10	4	8
Y	9	11	5	8	7

(10 marks)

6. a. Define the following terms : i) Independent event; ii) Mutually exclusive event ; iii) Equally likely Event.

(3 marks)

b. A machine is expected to produce nails of length 3 cm. A random sample of 25 nails gave an average length of 3.1 cm with SD 0.3 cm. can it be said that the machine is producing nails as per specification. (Given value of $t_{0.05}$ for 24 df is 2.064)

(7marks)

c. The quarterly sales for five years from 2008-2011 is given below. Use ratio to moving average method to determine the seasonal indexes.

Quarter	Sales (Rs. In thousand)			
	I	II	III	IV
2008	77	62	56	61
2009	85	64	62	79
2010	91	73	67	86
2011	102	80	74	95

(10 arks)

7. a. Explain the difference between simple and multiple regression with example. (3 marks)

b. A research was conducted to understand whether women have a greater variation in attitude on political issues than men. Two independent samples of 31 men and 41 women were used for the study. The sample variances so calculated were 120 for women & 80 for men. Test whether the difference in attitude toward political issues is significant at 5% level of significance using F test. (7marks)

c. Three machines are used in the packaging of 10 kg of wheat flour. Each machine is designed to pack on an average 10 kg of flour per bag. Samples of six bags were selected from each machine and the amount of wheat packaged in each bag is shown below:

achine 1	15.8	15.9	16.2	15.7	16.3	15.8
achine 2	16.5	16	15.4	15.9	16.2	16.1
achine 3	15.7	16.4	16.2	15.9	15.7	16.3

Use a 5 percent level of significance to test the hypothesis that the amount of wheat packaged by the three machines is the same using K-W test. (10 marks)

Part - B

2. a. The average daily sales of 500 branch offices was Rs. 150 thousand & the SD of Rs. 15 thousand. Assuming the distribution to be normal, indicate how many branches have sales between :(i) Rs. 120 thousand & Rs. 145 thousand
(ii) Rs. 140 thousand & Rs. 165 thousand (10 marks)

b. A manufacturing company has purchased three new machines of different makes and wishes to determine whether one of them is faster than the others in producing a certain output. Five hourly production figures are observed at random from each machine and the results are given in the table below:

	Machine A1	Machine A2	Machine A3
Observations	25	31	24
	30	39	30
	36	38	28
	38	42	25
	31	35	28

Use Analysis of Variance technique and determine whether the machines are significantly different in their mean speeds. (use $\alpha = 5\%$ value of F for (2,12) d.f. is 3.89).

(10 marks)
