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HI-Tech Institute of Engineering and Technology

MBA (I SEM)

PUT 2022-23

Business Statistics & Analytics (KMBN 104)

Faculty Name: Deepak Tomar

Time: 3hours

Total Marks: 100

Note :

- (1) Attempt all the three sections.
- (2) Be precise in your answer

**Section [A]**

**1. Attempt all questions: -(2\*10=20)**

- a) The mean age of MBA students is 20. The mean age of 60 male students is 21 years. If there are 40 girl students in the class than find the mean age of girls studying in MBA. **CO 1**
- b) The arithmetic mean of 150 observations was found out to be 80.5. At the time of calculation, one observation was wrongly recorded as 850 instead of 85. Calculate the correct mean. **CO 1**
- c) Write down the formulae for regression coefficients. **CO 3**
- d) Explain factor reversal test of index number. **CO 2**
- e) Find the probability that a card selected at random from a deck is an ace or a queen. **CO 4**
- f) If  $n$  is 10 and  $p$  and  $q$  are 60% and 40% respectively. Find the mean and standard deviation of Poisson distribution. **CO 4**
- g) What are the misuses of Statistics? **CO 1**
- h) Define Fixed base method in Index Numbers. **CO 2**
- i) Name the types of correlation. **CO 3**

- j) Define Advantages and Characteristics of Median. **CO 1**

**Section [B]**

**2. Attempt any three questions (10\*3=30)**

- a. Explain the concept of Index number and its uses. **CO 2**
- b. Define statistics. Explain the importance of statistics with reference to business and industry. **CO 1**
- c. Calculate coefficient of correlation from the following data: - **CO 3**  

Marks in Account:	48	33	40	9	18	14	67	24
	19	65						
Marks in Statistics:	12	13	29	6	15	4	20	9
	5	19						
- d. In a bolt factory, machines A,B& C manufacture 25%, 35% and 40% of the total output respectively. Of the total of their output, 5%, 4% and 1% are defective bolts. A bolt is drawn at random and is found to be defective. What is the probability that it was manufactured by Machine A, B and C? **CO 4**
- e. What is the major purpose of hypothesis testing? Explain the various steps involved in hypothesis testing. **CO 5**

**Section [C]**

**3. Attempt any one of the following (10\*1=10)**

- a. What do you mean by central tendency? Describe the methods of measuring the central tendency. **CO 1**
- b. In a hotel a total of 500 bulbs were installed simultaneously and their failure over time was observed as detailed below. You are required to calculate the mean life of bulbs. Also find standard deviation. **CO 1**

End of week	1	2	3	4	5	6	7
No. of failures	12	40	108	242	346	428	500

**4. Attempt any one of the following (10\*1=10)**

- a. Find the expected sales for the year 2012 with the help of least square method from the following information : **CO 2**

Year	2004	2005	2006	2003	2007	2008	2009	2010	2011
Sales	70	72	76	81	73	75	79	86	83

- b. From the following data find the following index numbers: **CO 2**
- Laspeyre's index
  - Paasche's index
  - Fisher's index

Commodity	Base Year		Current Year	
	Price	Quantity	Price	Value
A	25	50	50	2000
B	22	30	30	1200
C	54	44	44	1320
D	20	45	45	1350
E	18	15	15	630

**5. Attempt any one of the following (10\*1=10)**

- a. 8 coins are tossed 256 times. The actual results of getting a number of heads are as follows: **CO 4**

No. of Heads	0	1	2	3	4	5	6	7	8	Total
Frequencies	2	6	30	52	67	56	32	10	1	256

Find out expected frequencies, mean and standard deviation.

- b. The average monthly sales of 5000 firms are normally distributed. Its mean & standard deviation are Rs.36000 & Rs.10000 respectively. Find **CO 4**

- The number of firms having sales over 40000.
- The number of firms having sales between 30000 & 40000.
- Having sales less than 30000

(given area under normal curve from 0 to z for  $z_{0.4}=0.1554$  &  $z_{0.6}=0.2257$ )

**6. Attempt any one of the following (10\*1=10)**

- Distinguish between correlation & regression analysis. Write the mathematical properties of correlation. **CO 3**
- Write regression equations of X on Y and of Y on X for the following data – **CO 3**

X	45	48	50	55	65	70	75	72	80	85
Y	25	30	35	30	40	50	45	55	60	65

**7. Attempt any one of the following (10\*1=10)**

- Write a short note on the following: **CO 5**
  - t- test
  - z- test
- A certain drug is claimed to be effective in curing cold. In an experiment of 164 persons with cold, half of them given the drug and half of them given the sugar pills. The patient's reaction to the treatment are recorded in the following table

	Helped	Harmed	No effect
Drug	52	10	20
Sugar pills	44	12	26

Test the hypothesis that the drug is not better than sugar pills for curing cold.

(the value of chi square for degree of freedom 2 at 5% level of significance is 5.99) **CO 5**