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HI-Tech Institute of Engineering and Technology

MBA (I SEM)

PUT 2022-2023

Business Statistics & Analytics (KMBN 104)

Faculty Name: Deepak Tomar

Time: 3 hours

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 median of a series is 10, two addition observations 7 and 20 are added to the series. Find the median of new series. **CO 1**
- b) Define Regression Analysis. **CO 3**
- c) What is a Time-Series?? **CO 2**
- d) What are the uses of Index Numbers? **CO 2**
- e) What is the chance that a leap year selected at random will contain 53 Sundays? **CO 4**
- f) Define Coefficient of variation. **CO 1**
- g) State the objectives & essentials of an ideal average. **CO 1**
- h) The mean of 200 observations was 50. Later on, it was found that two observations were misread as 92 & 8 instead of 192 & 88. Find the correct mean. **CO 1**
- i) What is central tendency? **CO 1**
- j) What is Addition Theorem of Probability? **CO 4**

Section [B]

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

- a. Fit a straight line trend by the method of least square, tabulate the trend values & estimate the value for 2011 - **CO 2**

Year	2001	2002	2003	2004	2005	2006	2007	2008
value	380	400	650	720	690	695	600	850

- b. Define statistics & discuss its nature & scope in brief. How it is useful in decision-making? **CO 1**
- c. The mean and standard deviation of the wages of 6000 workers engaged in a factory are Rs. 1200 and Rs. 400 respectively. Assuming the distribution to be normal estimate: **CO 4**
 - i. Percentage of workers getting wages above Rs. 1600
 - ii. Number of workers getting wages between Rs. 600 & Rs. 900
 - iii. Number of workers getting wages between Rs. 1000 & Rs. 1500

The relevant extract of the area (under normal curve) from Z=0 to Z=z is given:

z	0.25	0.5	0.6	0.75	1.00	1.25	1.5
Area	0.0987	0.1915	0.2257	0.2734	0.3413	0.3944	0.4332

- d. From the price of shares of X and Y company find out the degree of correlationship: **CO 3**

X	53	54	52	53	56	58	52	50	51		49
Y	108	107	105	105	106	107	104	103	104		101

- e. Write a short note on any two of the following: **CO 5**
 - i. t- test
 - ii. Null and Alternative hypothesis
 - iii. Type I & Type II error

Section [C]

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

- a. What is meant by skewness? Describe the methods of measuring skewness.
CO 1

- b. An incomplete frequency distribution is given as follows.

Var.	10-20	20-30	30-40	40-50	50-60	60-70	70-80	Total
Freq.	12	30	?	65	?	25	18	229

Given that the median value is 46, determine the missing frequencies using the median formula. **CO 1**

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

- a. What is time series? Explain the various components of time series. Also discuss its importance. **CO 2**
- b. From the following data find Fisher's index number. Also show that it satisfies time reversal and factor reversal test: **CO 2**

Commodity	Base Year		Current Year	
	Price	Value	Quantity	Value
A	25	1000	50	2000
B	22	396	30	1200
C	54	864	44	1320
D	20	800	45	1350
E	18	540	15	630

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

- a. What is meant by Binomial distribution? Discuss the characteristics of binomial distribution. **CO 4**
- b. Five cards are drawn from a pack of 52 cards. Find the probability that:
CO 4
- i. 4 are aces
 - ii. 4 are aces and 1 is a king
 - iii. 3 are kings and 2 are queens
 - iv. A king, queen, jack, 10 and 9
 - v. 3 are of one suit and 2 are from another.

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

- a. Define correlation and explain how the coefficient of correlation is calculated by Karl person's method. What are the limits between which the value of r is found? **CO 3**

- b. You are given the following information about advertising expenditures and the sales: **CO 3**

	Advertisement (Rs. In lakhs)	Sales(Rs. In Lakhs)
Arithmetic Mean	10	90
Standard Deviation	3	12

The coefficient of correlation is 0.8

- Obtain two regression equations.
- Find the likely sales when the advertising budget is Rs. 15 lakhs.
- What should be advertising budget if the company wants to attain sales target of Rs. 120 Lakhs.

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

- a. A sample analysis of examination results of 500 students was made. It was found that 220 had failed, 170 had secured a third class, 90 were placed in second class & 20 got a first class. Are these figures commensurate with the general examination results which is in the ratio of 4:3:2:1 for the various categories respectively? **CO 5**

(the tabular value for three degrees of freedom at 5% level of significance is 7.81)

- b. What do you mean by Business Analytics? Discuss its applications.
CO 5