Reg. No ..... Name **20U306**

B C A DEGREE END SEMESTER EXAMINATION - OCT. 2020: JANUARY 2021

SEMESTER 3 : MOBILE APPLICATIONS AND CLOUD TECHNOLOGY

COURSE : **19U3CRBCA7 : BASIC STATISTICS**

(Common for Regular - 2019 Admission & Supplementary 2018, 2017 & 2016 Admissions)

Time : Three Hours Max. Marks: 75

PART A

Answer All (1 mark each)

1. **Find the combined arithmetic mean of two samples of sizes 6 and 4 respectively whose means are 15 and 25.**
2. **Find the mean of the first six multiples of 4.**
3. **If the mean of 9, 8, 10, x, 12 is 15, find the value of x.**
4. **If the standard deviation of a data is 4.5 and if each value of the data is decreased by 5, then find the new standard deviation.**
5. **Prove that for two variables X and Y , Pearson's correlation coefficient rxy lies in the interval [-1,1].**
6. **If the standard deviation of a data is 3.6 and each value of the data is divided by 3, then find the new variance and new standard deviation.**
7. **Write down the Classical definition of probability.**
8. **State Multiplication theorem for three events.**
9. **What are the different types of Index numbers?**
10. **Explain Fisher's price Index.**

(1 x 10 = 10)

PART B

Answer any 8 (2 marks each)

11. **The mean yearly salary of employees of a company was Rs.36,000. The mean yearly salaries of male and female employees were Rs. 40,000 and Rs. 30,000 respectively.Find the percentage of male and female workers in the company.**
12. **The average height of 25 students was 160 cms. It was later found that the height of one student was misread as 120 cms. Instead of the correct value 180 cms. Calculate the correct average.**
13. **Calculate the median for the following data:**

Class:	**0-10**	**10-20**	**20-30**	**30-40**	**40-50**	**50-60**
Frequency:	**6**	**10**	**15**	**20**	**12**	**7**

14. **What are the properties of a good measure of dispersion?**
15. Write a short note on correlation and regression.
16. **Obtain the coefficient of quartile deviation for the following data:**

Class:	**0-10**	**10-20**	**20-30**	**30-40**	**4-50**	**50-60**	**60-70**
Freq:	**5**	**9**	**20**	**31**	**18**	**11**	**6**

17. **Find the probability of getting two heads when five coins are tossed.**
18. **An experiment results in one of the three mutually exclusive events A,B,and C. It is known that p(A) = 0.50 , P(B)= 0.30 and P(C)=0.20. Find the probabilities :**

    1. **P(A ∩ B)** **2) P(A ∪ B)** **3)P(A/B)**

19. **State and prove addition theorem for two events**
20. **Explain Time Series.**
21. **What are the objectives of time series?**
22. **What are the methods for finding trends?**

(2 x 8 = 16)

PART C

Answer any 5 (5 marks each)

23. **Obtain the 7th deciles and 95th percentile for the following 100 observations**

Class:	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80
Freq:	7	13	18	22	17	13	6	4

24. **A train covers the first 16 miles at an average speed of 20 mph, another 20 miles at 40 mph and the last 10 miles at 15 mph. Find the average speed of the entire journey.**
25. **What is Box- Whisker Plot?**
26. **Explain scatter diagram and its use.**
27. **For three events A, B and C , give an illustration to show that the pairwise independent need not imply their mutual independence.**
28. **A couple has two children. Use Baye's theorem to find the probability that both are girls if the eldest is a girl.**
29. **Calculate Fisher's Quantity index number for the following data:**

Article	Quantity in 2000	Quantity in 2005	Price in 2000	Price in 2005
A	4	5	23	26
B	5	5	25	26
C	3	4	21	25
D	7	6	19	27
E	6	7	24	25
F	7	6	27	30

(5 x 5 = 25)

PART D

Answer any 2 (12 marks each)

30. **Calculate Mean, Median, Mode from the following grouped data**

Class	Frequency
2 - 4	3
4 - 6	4
6 - 8	2
8 - 10	1

31. **Prove the invariance of correlation coefficient under linear transformation.**
32. **Each of the three jewelry boxes has two drawers. In each drawer of the first box there is a gold watch. In each drawer of the second box there is a silver watch. In one drawer of the third box there is a gold watch while in the other there is a silver watch. One box is selected at random and opened one of the drawers and it contains a gold watch. What is the probability that the other drawer also has a gold watch?**
33. **Fit a straight line trend for the following data by the method of least squares and estimate the production of 2008.**

Year	2000	2001	2002	2003	2004	2005	2006
Production	50	47	52	45	48	55	60

(12 x 2 = 24)