B. C. A. DEGREE END SEMESTER EXAMINATION - OCTOBER 2018

SEMESTER – **3: BACHELOR OF COMPUTER APPLICATIONS (CORE COURSE)**

COURSE: **16U3CRBCA7, BASIC STATISTICS**

(For Regular - 2017 Admission and Supplementary / Improvement 2016 Admission)

Time: Three Hours   Max Marks: 75

PART A

(Answer all questions, each question carries **1** mark.)

1. Define mutually exclusive events.
2. What is non-probability sampling?
3. State any two limitations of index numbers. What do you mean by qualitative classification?
4. What does CPI stands for in the context of index numbers?
5. Define Simple Random Sampling.
6. Define Harmonic mean and give the formula for it.
7. For a moderately asymmetrical distribution compute the median, if mode and mean are 32.1 and 35.4 respectively
8. State the addition theorem of probability for three arbitrary events.
9. The chance of A to stand first in the class is 1/3 and that of B is 1/5. What is the probability of either of the two will stand first?
10. How can you locate median graphically?   (1 x 10 = 10)

PART B

(Answer any **eight** questions. Each question carries **2** marks.)

11. If A, B, C are three events, define the conditions for pairwise independence and mutual independence of three events.
12. Give the axiomatic definition of probability
13. Explain the time reversal test for index numbers.
14. Given P(A)= p_1 P(B)=p_2 P(A$\cap B$) $= p_3$. Find (a) P(A' $\cap B'$) (b) P(A' UB')
15. Calculate the 5th decile for the following values.
    65, 70, 100, 33, 85, 52, 45, 17, 2
16. Explain the various methods of classification of statistical data
17. State the multiplication theorem for probability.
18. Explain systematic sampling.
19. What are equally likely events?
20. How will you construct stem and leaf chart?
21. What is a frequency curve?

22. The following table gives the prices of 6 commodities in 1990 and 2000. Calculate the simple arithmetic mean index number for 2000 taking 1990as the base year.

Commodity : A B C D E F

Price in 1990 : 40 60 20 50 80 100

Price in 2000 : 50 60 30 70 90 110   (2 x 8 = 16)

PART C

(Answer any *five* questions. Each question carries *5*marks.)

23. Probabilities that a husband and wife will be alive 20 years from now is given by 0.8 and 0.9 respectively. Find the probability that in 20 years
    (a) both
    (c) Neither
    (b) At least one will be alive

24. Find the missing frequency from the following data

    Marks   :   0-10 10-20 20-30 30-40 40-50 50-60
    Frequency :   5   15   20   ---   20   10

    The arithmetic mean is given to be 34 marks.

25. Define coefficient of variation. The prices of two commodities A and B during five weeks is given below. Which of the two has more stable price?

    Commodity A :   45 38 50 42 40

    Commodity B : 80 78 84 80 68

26. Explain the various steps involved in the Finding the missing frequencies in frequency distribution.

27. The following table gives the monthly expenditure in rupees on various items incurred by three families. Represent it by a sub divided bar chart.

	Family 1	Family 2	Family 3
Food	43	83	120
Clothing	08	17	25
Rent	10	21	17
Others	14	34	45
Total	75	155	207

28. Find the harmonic mean for the following frequency distribution.

Size	:	0-10	10-20	20-30	30-40	40-50
Frequency :		2	3	7	5	2

29. State and prove the addition theorem of probability for two events. Given P(A)=0.3

$P(A \cap B') = 0.2$ $P(B \cap C) = 0.3$. $Find$ $(a) P($ B'/C') (b) P(A/B)

(5 x 5 = 25)

PART D

(Answer any *two* questions. Each question carries *12* marks.)

30. Obtain the quartile deviation and its coefficient for the following data.

Class	:	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89
Frequency :		5	8	17	29	30	20	10	1

31. Calculate weighted index numbers by (a) Laspayer's method (b) Paasche's method (c) Fisher's method.
    Satisfy factor reversal test.

Commodity	Price		Quantity	
	Base year	Current year	Base year	Current year
A	4	7	10	8
B	5	9	8	6
C	6	8	15	12
D	2	2	5	6

32. (a) State Total Probability Law.

    (b) There are 4 machines that produces the same items. Machines 1 and 2 each produce 20% of the total output while machines 3 and 4 each produce 30% of the total output. It is known that machine 1 produces 6% of the items as defective while machine 2 produces 5% defective items. Machines 3 and 4 each produces 8% defective items. An item is chosen at random from the output of the factory.

    (1) What is the probability that this item is defective?

    (2) Given that the item selected is defective, what is the probability that it is produced by machine 3?

33. Calculate Arithmetic mean and Standard deviation for the data on scores given below.

Scores	:	0-10	10-20	20-30	30-40	40-50	50-60	60-70
No. of students :		10	15	25	25	10	10	5

(12 x 2 = 24)