**COMMERCE FACTORY**

## FOURTH SEMESTER B.Com. DEGREE EXAMINATION, APRIL 2016

### (CUCBCSS—UG)

Complementary Course

## BCM 4C 04—QUANTITATIVE TECHNIQUES FOR BUSINESS

Time : Three Hours                                                         Maximum : 80 Marks

### Part A

*Answer all questions.*
*Each question carries 1 mark.*

1. An event whose occurrence is inevitable is called :

    (a) Sure event.

    (b) Impossible event.

    (c) Uncertain event.

    (d) Equally likely events.

2. Mean deviation for Normal distribution is :

    (a) $2/3 \, \sigma$.

    (b) $4/5 \, \sigma$.

    (c) $1/2 \, \sigma$.

    (d) None of the above.

3. From the following identify Type I error :

    (a) Accepting a null hypothesis when it is true.

    (b) Rejecting a null hypothesis when it is true.

    (c) Rejecting a null hypothesis when it is false.

    (d) Accepting a null hypothesis when it is false.

4. Let 'S' denote the sample space, then $p\,(S) =$

    (a) 0.

    (b) 1.

    (c) Infinity.

    (d) $0 \leq P(A) \geq 1$.

5. P (B/A) :

    (a) $\dfrac{p(A \cap B)}{p(A)}$.

    (b) $P(A) \times P(B)$.

    (c) $\dfrac{p(A \cap B)}{P(B)}$.

    (d) $P(A) + P(B)$.

Fill in the blanks :

6. When the amount of change in one variable leads to a constant ratio of change in another variable, it is known as ————.

**Turn over**

7. The parameter of Poisson distribution is ————.

8. Normal distribution with mean = 0 and standard deviation = 1 is known as ————.

9. If A and B are mutually exclusive disjoint events, P (A $\cup$ B) = ————.

10. Chi-square test was developed by ————.

$(10 \times 1 = 10$ marks$)$

## Part B

*Answer any* **eight** *questions from the following.*
*Each question carries 2 marks.*

11. What is Quantitative Techniques ?

12. What is a Scatter diagram ?

13. Define probability.

14. Find out the value of 8C3

15. Two coins are tossed. What is the probability of getting at least one head ?

16. State the Addition rule of probability for mutually exclusive events.

17. What is a continuous random variable ?

18. Define Poisson distribution.

19. Mention the assumptions of $t$ test.

20. What is Standard error ?

$(8 \times 2 = 16$ marks$)$

## Part C

*Answer any* **six** *questions from the following.*
*Each question carries 4 marks.*

21. Explain Baye's theorem.

22. Explain the methods of drawing regression lines.

23. How a quantitative technique helps business and industry ?

24. You are given the following data.

|  | | X | Y |
|---|---|---|---|
| Arithmetic mean | ... | 36 | 85 |
| Standard deviation | ... | 11 | 8 |

Correlation co-efficient between $x$ and $y$ = 0.66

   (i) Find the two regression equations.

   (ii) Estimate the value of $x$ when $y$ = 75.

25. Given a normal distribution with mean = 50 and SD = 10 find the value of X that has :

    (a)   13 % of value to its left.

    (b)   14 % of value to its right.

26. The probability that A solves the problem in statistics is 2/5 and the probability that B solves is 3/8. If they try independently find the probability that :

    (i)   Both solve the problem.

    (ii)  None solve the problem.

    (iii) Atleast one solve the problem.

27. In a box contains 500 apples, 50 are found to be defective. The wholesaler of the apple claims that only 6 % of the apples supplied by him will be defective. Test the claim of the wholesaler.

28. The ranking of 10 individuals at the start and at the finish of a course of a training are as follows :

    | Individuals | ... | A | B | C | D | E | F | G | H | I | J |
    |-------------|-----|---|---|---|---|---|---|---|---|---|---|
    | Rank before | ... | 1 | 6 | 3 | 9 | 5 | 2 | 7 | 10 | 8 | 4 |
    | Rank after  | ... | 6 | 8 | 3 | 2 | 7 | 10 | 5 | 9 | 4 | 1 |

    Calculate Spearman's Rank correlation co-efficient.

$$(6 \times 4 = 24 \text{ marks})$$

## Part D

*Answer any **two** questions from the following.*
*Each question carries **15 marks**.*

29. In Big Food, a fast food chain feels that it is gaining bad reputation because it takes too time to serve its customers. Since the chain has four restaurants in this town, it is concerned with whether the 4 restaurants have the same average service time. One of the owners of the fast food chain has decided to visit each of the stores and monitor the service time for five randomly selected customers. He recorded the following times in minutes.

    | Restaurants | Service time for 5 customers | | | | |
    |-------------|---|---|-----|-----|-----|
    | I   | 3 | 4   | 5.5 | 3.5 | 4   |
    | II  | 3 | 3.5 | 4.5 | 4   | 5.5 |
    | III | 2 | 3.5 | 5   | 6.5 | 6   |
    | IV  | 3 | 4   | 5.5 | 2.5 | 3   |

    Test whether all restaurants have the same mean service time. Use ANOVA.

**Turn over**

30. Two sample polls of votes for 2 candidates A and B for a public office are taken, one from residents of rural areas and other from among residents of urban areas. The results are given below. Examine whether the nature of the area is related to voting preference in the election.

### Candidates

| Area | | A | B | Total |
|---|---|---|---|---|
| Rural | ... | 620 | 480 | 1,100 |
| Urban | ... | 380 | 520 | 900 |
| Total | ... | 1,000 | 1,000 | 2,000 |

31. Explain various approaches to probability with examples.

(2 × 15 = 30 marks)