M 7574

Reg. No. : .....

Name : .....

III Semester B.C.A. Degree (CCSS – Reg./Supple./Imp.) Examination, November 2014

COMPLEMENTARY COURSE IN MATHEMATICS FOR B.C.A.

3C03 MAT : Probability Distributions and Statistical Inference

Time : 3 Hours Max. Weightage : 30

Answer **all** questions. Weightage for a bunch of **four** questions is **1**.

1. Fill in the blanks.
   a) The set of all mutually exclusive and exhaustive events of a sample space form a _____ of the sample space.
   b) For a continuous r.v.X, $\frac{dF(x)}{dx}$ gives the _____ of the r.v.
   c) P(Rejecting H_0/H_1 is true) is the _____ of the test.
   d) The statistic for testing goodness of fit test is _____
   e) For a Normal distribution the coefficient of skewness is _____
   f) The m.g.f. of a B(n, p) is
   g) If $\lambda = 2.4$ the mode of the Poisson distribution is _____
   h) If the correlation coefficient is + 1, there is _____ relation between the variables. **(2×1=2)**

Answer **any 6** questions. Weightage **1 each**.

2. Derive mean of Poisson distribution.

3. Define null and alternative hypothesis.

4. Define p.d.f. and its properties.

5. What is rank correlation ?

P.T.O.

6. Find the mode of the distribution $P(x) = \left(\frac{1}{2}\right)^x; x = 1, 2, ...$

7. Describe Markovian queues.

8. Write any four properties of Normal distribution.

9. Write the test statistic for testing the single mean for a small sample test.

10. Distinguish between correlation and regression. **(6×1=6)**

Answer **any seven** questions. Weightage **2 each** :

11. Derive Poisson as a limiting form of Binomial.

12. Find the mgf of Normal distribution.

13. In a distribution exactly normal, 7% of the items are under 35 and 89% are under 63. What are the mean and s.d. of the distribution ?

14. By the method of least squares fit the equation $y - ae^{bx}$.

15. Explain the characteristics of a queueing model.

16. State Neyman-Pearson Lemma.

17. Describe χ^2 -test for independence of attributes.

18. Derive angle between two regression lines.

19. X is a Poisson variate such that

    $P(x = 2) = 9P(x = 4) + 90\ P(x = 6)$

    Find the mean of x.

20. S.T. $-1 \leq r_{xy} \leq 1$.

21. What is Poisson Process ? **(7×2=14)**

Answer **any 2**. Weightage **4 each** :

22. Obtain correlation coefficient for the following data :

x :	65	66	67	67	68	69	70	72
y :	67	68	65	68	72	72	69	71

23. In a certain experiment to compare two types of pig foods A and B, the following results of increase in weights were observed in pigs.

Increase in Wt. in lb								
Food A	49	53	51	52	47	50	52	53
Food B	52	55	52	53	50	54	54	53

i) Assuming that the two samples of pigs are independent, can we conclude that food B is better that food A.

ii) Also examine the case when the same set of eight pigs were used in both the foods.

24. Fit a Poisson distribution to the following data and test the goodness of fit.

x :	0	1	2	3	4	5	6
f :	275	72	30	7	5	2	1

(2×4=8)
