

**BCA (H) 3rd Semester Examination, 2020**

**Subject: Computer Application**

**Paper: BCA – 304 (Mathematics-III)**

**Time: 3 Hours**

**Full Marks: 80**

*The figures in the margin indicate full marks.*

*Candidates are required to give their answers in their own words*

*as far as practicable.*

**A. Answer any five Questions.**

**5x10=50**

1. a) A bag contains 2 white balls, 3 black balls and 4 red balls. In how many ways can 3 balls be drawn from the bag, if at least one black ball is to be included in the draw?  
b) When two dice are rolled, find the probability of getting a greater number on the first die than the one on the second, given that the sum should equal 8. 5+5
  
2. a) Define conditional probability. If A and B are two independent events, prove that  
i)  $A^c$  and B are independent  
ii)  $A^c$  and  $B^c$  are independent.  
  
b) Explain Simple random sampling. 5+5
  
3. Briefly discuss on Bivariate continuous distribution. 10
  
4. What is random sampling? Discuss various types of random sampling. 2+8
  
5. Find by Lagrange's formula, the interpolation polynomial which corresponds to the following data:

x	-1	0	2	5
F(x)	9	5	3	15

10

6. Given

x	1	2	3	4	5	6	7	8
f(x)	1	8	27	64	125	216	343	512

Find  $f(1.5)$  and  $f(7.5)$  using Newton's forward and Backward Interpolation formula respectively.

10

7. a) Calculate the value of  $\int_0^1 x dx / (1+x)$  correct up to 3 significant figures, taking  $h=0.2$  using Simpson's One-third Rule .

b) Write an algorithm to evaluate integral  $\int_0^1 x dx / (1+x)$  for  $h=0.1$  using Trapezoidal Rule.

5+5

**B. Answer any six Questions.**

**6x5=30**

1. In a group of 6 boys and 4 girls, four children are to be selected. In how many different ways can they be selected such that at least one boy should be there?
2. Discuss Binomial distribution.
3. What is correlation coefficient and write down its properties.
4. What do you mean by linear regression? Differentiate between Correlation and Regression.
5. Discuss Normal distribution.
6. Discuss different types of errors in Numerical Analysis.
7. Give the geometrical interpretation of Trapezoidal rule.
8. Write an algorithm to find the root of the equation  $f(x)=0$  using Regula-Falsi method.