Hall Ticket Number :										

Code: 5P2B12

R-15

M.C.A. I Semester Supplementary Examinations June 2017

Computer Programming

Max. Marks: 60 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 12 = 60 Marks)

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UNIT–I

1. a) Differentiate between algorithm and pseudo code. Write an algorithm and pseudocode for finding the sum of n numbers. 6M

   b) Discuss about precedence and associativity of operators in C language. 6M

OR

2. a) Differentiate between while and do-while loop and give an example. 4M

   b) Explain about string manipulation functions with examples. 8M

UNIT–II

3. a) Explain about pass by value and pass by reference parameter passing mechanism with suitable example. 6M

   b) What do you mean by Recursion? Write a C program to find the factorial of a given number using recursion. 6M

OR

4. a) Explain about nested structure with suitable example. 6M

   b) Explain about different file operations. 6M

UNIT–III

5. a) Explain about friend function is C++ with suitable example. 6M

   b) Explain the structure of C++ program. 6M

OR

6. a) Discuss about nested classes in C++. 6M

   b) Explain about dynamic creation and destruction of objects. 6M

UNIT–IV

7. a) Explain about Function overloading with examples. 6M

   b) Discuss about pure virtual function. 6M

OR

8. a) Write about Object Composition in C++. 4M

   b) Define inheritance? Explain about different types of inheritance in C++. 8M

UNIT–V

9. a) Explain about file streams and console streams. 8M

   b) Write about manipulators 4M

OR

10. a) Explain about Exception Handling Model of C++. 8M

    b) What are the benefits of Exception Handling? 4M

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Hall Ticket Number :

Code: 5P2B11 **R-15**

M.C.A. I Semester Supplementary Examinations June 2017

Mathematical Foundations of Computer Science

Max. Marks: 60 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 12 = 60Marks)

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UNIT-I

1. a) Obtain the PCNF of the formula S given by $(\neg P \rightarrow R) \cap (Q \leftrightarrow P)$? 6M

   b) Explain about well formed formulas? 6M

OR

2. a) Show that$(\neg P \cap (\neg Q \cap R)) U (Q \cap R) U (P \cap R) \leftrightarrow R$ 6M

   b) Explain about the difference between the principle disjunctive and conjunctive normal forms? 6M

UNIT-II

3. a) Define relation. Explain properties of binary relations in a set? 6M

   b) What are the operations on relations? 6M

OR

4. a) Explain semi-groups and monoids with examples? 6M

   b) Define groups with examples and conditions of algebraic system? 6M

UNIT-III

5. a) Pigeonhole principles and explain its applications? 6M

   b) Suppose there are 26 students and 7 cars to transport them then at least one car must have more than 4 passengers? 6M

OR

6. There are 30 females and 35 males in the junior class while there are 25 females and 20 males in the senior class. In how many ways can a committee of 10 be closer so that there are exactly 5 females and 3 juniors on the committee? 12M

UNIT-IV

7. Solve the recurrence relation: $a_n - 7a_{n-1} + 10a_{n-2} = 0$ for $n \geq 2$ 12M

OR

8. Solve the recurrence relation on $a_n - 9a_{n-1} + 26a_{n-2} + 24a_{n-3} = 0$ for $n \geq 3$ 12M

UNIT-V

9. a) What is the chromatic number of a cycle and a tree? 8M

   b) Define Hamilton train? 4M

OR

10 a) What is the chromatic number K_N? 6M

   b) Define isomorphism of graphs. Illustrate with an example. 6M

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Hall Ticket Number :										

R14

Code: 4P2C13

M.C.A. I Semester Supplementary Examinations June 2017

Probability and Statistics

Max. Marks: 60 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 12 = 60 Marks)

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UNIT–I

1. a) Find the expected value and variance of the number of heads appearing when two fair coins are tossed. 6M

   b) X is a continuous random variable with probability density function given by

$$f(x) = \begin{cases} k\,x^{\alpha-1}(1-x)^{\beta-1}, & 0 < x < 1,\ \alpha > 0, \beta > 0 \\ 0, & otherwise \end{cases}$$

   Find k and mean value of X. 6M

OR

2. a) Define Conditional Probability. Also State and Prove Baye's theorem. 6M

   b) A random variable X has the following probability function :

x	0	1	2	3	4	5	6	7
P(x)	0	k	2k	2k	3k	K^2	$2k^2$	$7k^2 + k$

   Find (i) k (ii) Evaluate P(X<6), $P(X \geq 6)$ *and* $P(0 < X < 5)$ 6M

UNIT–II

3. a) The mean and variance of a binomial variable X with parameters n and p are 16 and 8. Find $P(X \geq 1)$ and $P(X > 2)$. 6M

   b) The marks obtained in Statistics in a certain examination found to be normally distributed. If 20% of students greater than are equal to 70 marks, 50% of the student less than 40 marks, find the mean and standard deviation. 6M

OR

4. a) If 3% of the electric bulbs manufactured by a company are defective, find the probability that in a sample of 100 bulbs, (i) 0 (ii) 1, (iii) 2, (iv) 3, (v) 4, (vi) 5 bulbs will be defective. 6M

   b) If a poisson distribution is such that $P(X = 1)\frac{3}{2} = P(X = 3)$, find

   (i) $P(X \geq 1)$ (ii) $P(X \leq 3)$ (iii) $P(2 \leq X \leq 5)$ 6M

UNIT–III

5. A population consists of the four numbers **3, 7, 11, 15**. Consider all possible samples of size two that can be drawn with replacement from this population.

   Find (i) The population mean,

   (ii) The population standard deviation,

   (iii) The mean of the sampling distribution of means,

   (iv) The standard deviation of the sampling distribution of means. 12M

OR

6. a) Define Point Estimation and Interval Estimation 4M

   b) The contents of 7 similar containers of sulfuric acid are 9.8, 10.2, 10.4, 9.8, 10.0, 10.2, and 9.6 liters. Find a 95% confidence interval for the mean of all such containers, assuming an approximate normal distribution. 8M

UNIT–IV

7. a) In a certain district A, 450 persons were considered regular consumers of tea out of a sample of 1000 persons. In another district B, 400 were regular consumers of tea out of a sample of 800 persons. Do these facts reveal a significant difference between the two districts as far as tea drinking habit is concerned? 6M

   b) The IQ s (intelligence quotients) of 16 students from one area of a city showed a mean of 107 with a standard deviation of 10, while the IQs of 14 students from another area of the city showed a mean of 112 with a standard deviation of 8. Is there a significant difference between the IQs of the two groups at a 0.05 level of significance? 6M

OR

8. a) A sample poll of 300 voters from district A and 200 voters from district B showed that 56% and 48%, respectively, were in favor of a given candidate. At a level of significance of 0.05, test the hypothesis that there is a difference the districts. 6M

   b) In two independent samples of sizes 8 and 10 the sum of squares of deviations of the sample values from the respective sample means were 84.4 and 102.6 .Test whether the differences of variances of the populations is significant or not. Use a 0.05 level of significance. 6M

UNIT–V

9 In experiments on pea breeding, the following frequencies of seeds were obtained:

Round and Yellow	Wrinkled and Yellow	Round and Green	Wrinkled and Green	Total
315	101	108	32	556

Theory predicts that the frequencies should be in proportions $9:3:3:1$. Examine the correspondence between theory and experiment. Use a 0.05 level of significance. 12M

OR

10 A random number table of 250 digits had the distribution of the digits 0, 1, 2… 9 shown in the following table. Does the observed distribution differ significantly from the expected distribution use a 0.01 level of significance.

Digit	0	1	2	3	4	5	6	7	8	9
Observed Frequency	17	31	29	18	14	20	35	30	20	36
Expected Frequency	25	25	25	25	25	25	25	25	25	25

12M

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Expected Frequency	25	25	25	25	25	25	25	25	25	25

12M

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