Hall Ticket Number :										

R-15

Code: 5GC33

II B.Tech. I Semester Regular Examinations November 2016

Probability & Statistics

(Computer Science and Engineering)

Max. Marks: 70 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70Marks)

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UNIT–I

1. a) The chances of th tuc **UNIT–I** Olympiad are $\frac{1}{2}, \frac{1}{3}$ ree st $\frac{1}{4}$ dents A, B and C solving a problem given in mathematics $and\ respectively$. What is the probability of the problem being solved.

   b) A consulting firm rents cars from three agencies, 20% from agency D, 20% from agency E and 60% from agency F. If 10% of the cars from D, 12% of the cars from E and 4% of the cars from F have bad tires, what is the probability that the firm will get a car with bad tires?

OR

2. a) A discrete random variable has probability distribution

x	1	2	3	4	5
p(x)	0.12	0.15	0.23	0.	0.2

   Calculate

   (a) Expected value

   (b) Standard Deviation.

   b) Let x be a con rd Dev; ran n. tinuous dom variable assuming any value x in $[0, \pi/2]$

   i) Verify if $f(x) = \cos x \ in\ [0, \pi/2]$ is suitable for a pdf.

   ii) Find the probability that $x \in \left[0, \frac{\pi}{4}\right], x > \frac{\pi}{4}\ and\ x < \frac{\pi}{3}$

UNIT–II

3. a) Find the mean and variance of a Normal distribution.

   b) In a factory 2% of items are defective, by using Poisson distribution, find the probability of having more than 2 defective items in a sample of 100 item.

OR

4. Fit a Poisson distribution to the following data

	0	1	2	3	4
	122	60	15	2	1

UNIT–III

5. Find the mean and Standard Deviation of sampling distribution of variances for the population 2,3,4,5 by drawing samples of size two.

   a) With replacement

   b) Without replacement.

OR

6. a) A random sample of size 00 is taken from a population with = 5.1. Given that the sample mean is $n=10$ $\bar{x} =$ 21.6 construct a 95% confidence interval for the population mean μ.

   b) Consider n=80, an is 18 21.6 con struc 7 (95% 5.55) construct a 99% confidence interval for the μ $\bar{x} =$ .85 $and\ S^2 =$ 30.7 $S =$

UNIT–IV

7. a) A manufacturer of a patent medicine claimed that it was 90% effective in relieving an allergy for a period of 8 h. In a sample of 200 people who had the allergy, the medicine provided relief for 160 people. Determine whether manufacturer's claim is legitimate by using 0.01 as the level of significance.

   b) It has been claimed that the resistance of electric wire can be reduced by more than 0.050 ohm by alloying. To test this claim, 32 values obtained for standard wire yielded $\bar{x} = 0.136\ ohm$ and $S_1 = 0.004\ ohm$ and 32 values obtained for alloyed wire yielded $x_2 = 0.083\ ohm$ and $S_2 = 0.005\ ohm$. At the 0.05 ohm level of significance, does this support the claim.

OR

8. A new process of producing synthetic diamonds can be operated at a profitable level only if the average weight of the diamonds is greater than 0.5 carat. To test the profitability of the process, 6 diamonds are produced with weights 0.45, 0.60, 0.52, 0.49, 0.58 and 0.54 carat respectively. Do the 6 measurements present sufficient evidence to indicate that the average weight of the diamonds produced by the process is in excess of 0.5 carat?

UNIT–V

9. In order to determine whether perfection in job depends on the experience, 400 persons were examined by yielding the following data.

		Experience		
		High	Medium	Low
perfection	Excellent	23	60	29
	Good	28	79	60
	Satisfactory	9	49	63

OR

10. The following data gives the results of an investigation on the sex distribution of the children of 32 families containing four children each. Use the binomial distribution with n=4 and $p = \frac{1}{2}$ to calculate expected frequencies. Then apply the χ^2 test to determine whether this binomial model is satisfactory here. Comment.

Number of Sons	0	1	2	3	4
Number of families	4	10	8	7	3

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Hall Ticket Number :										

Code: 5G236

R-15

II B.Tech. I Semester Regular Examinations November 2016

Electrical Engineering and Electronics Engineering

(Common to CSE & IT)

Max. Marks: 70 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)

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UNIT–I

1. a) How the Network elements can be classified. Explain it clearly. 7M

   b) In the network shown in figure 1b, find all branch currents and voltage drops across all resistors.

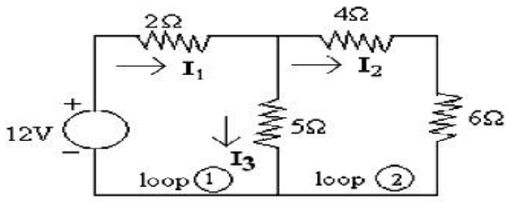

Figure 1b 7M

OR

2. a) Define ohms law and its limitations 4M

   b) A current of 10 A flows through a resistor for 10 min. and the power dissipated by the resistor is 100 W. Find the p.d. across the resistor and the energy supplied to the circuit 5M

   c) Four resistors of 2 ohm, 3 ohm, 4 ohm & 5 ohm respectively, are connected in parallel. What potential difference must be applied to the group in order that total power of 100 W may be absorbed? 5M

UNIT–II

3. a) Explain the principle of operation of generator 8M

   b) A 240V,dc shunt motor takes 32 A of line current of the armature and field resistances are 1.2Ω and 240Ω respectively of the load torque remains constant, find the resistance inserted in series with the armature to have the speed. 6M

OR

4. a) Explain the concept of self- excitation of dc generator and list out the types of generator 7M

   b) A 220V, DC shunt motor taker a total current of 100 A and runs at 750 rpm. The resistance of the armature winding and shunt field winding are 0.1 Ω and 40 Ω respectively. Find the torque developed by armature. 7M

UNIT–III

5. a) What is regulation? Derive an expression for the approximate voltage regulation 7M

   b) 3-phase, 6 pole, 50 Hz induction motor has a slip of 1% at no-load and 3% at full load. Determine (i) Synchronous speed (ii) No-load speed (iii) Full load speed (iv) frequency of motor current at full load 7M

OR

6. a) Explain the principle of operation of an alternator with neat diagram 7M

   b) A single phase transformer working at unity power factor has an efficiency of 90% at half load and full load of 500 W. Determine the efficiency at 75% of full load 7M

UNIT–IV

7. a) Explain V-I characteristics of P-N junction diode. 7M

   b) Write short note on single stage CE amplifier 7M

OR

8. a) Explain the working of P-N-P transistor and mention its input-output characteristics. 7M

   b) Explain the operation of half wave and full wave rectifiers with neat circuit diagrams 7M

UNIT–V

9. Derive the expression for electro static deflection of CRO 14M

OR

10. Explain the operation of CRO with a neat sketch. CRO is used to measure frequency and amplitude of a signal. Explain how 14M

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Hall Ticket Number :										

R-15

Code: 5G133

II B.Tech. I Semester Regular Examinations November 2016

Principles of Programming Languages

(Computer Science and Engineering)

Max. Marks: 70 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)

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UNIT–I

1. a) Describe the characteristics of a good programming language and how are they evaluated? 7M

   b) What are the disadvantages of having too many features in a programming language? 7M

OR

2. Explain the formal methods used for describing syntax. 14M

UNIT–II

3. a) Mention the advantages and disadvantages of static and dynamic binding? 7M

   b) Explain the design issues of arrays. 7M

OR

4. a) How does operand evaluation order interact with functional side effects? 7M

   b) How does C support relational and Boolean expressions? 7M

UNIT–III

5. a) What are the design issues of multiple selection statements? 7M

   b) Explain how C# switch statement is safer than that of Java? 7M

OR

6. a) Explain the characteristics of subprograms? 7M

   b) Illustrate the three semantic models of parameter passing. 7M

UNIT–IV

7. How is exception handling implemented in Ada, C++, Java? 14M

OR

8. a) Illustrate C++ parameterized Abstract Data Types with an example. 7M

   b) How is concurrency achieved using semaphores? 7M

UNIT–V

9. a) Explain different approaches that math goals to facts in a database? 7M

   b) Discuss the applications of logic programming. 7M

OR

10. a) Describe the syntax and semantics of COND, LET. 7M

    b) What are the differences between CONS, LIST and APPEND? 7M

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Hall Ticket Number :										

R-15

Code: 5G132

II B.Tech. I Semester Regular Examinations November 2016

Digital Logic Design

(Computer Science and Engineering)

Max. Marks: 70 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70Marks)

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UNIT–I

1. a) Convert the given Binary number 11011101 into
   i) BCD
   ii) Hexa-decimal
   iii) Decimal 6M
   b) What is a 2's complement? Explain it with an example? 4M
   c) Explain How to subtract the given two binary numbers using 2's complement with an example. 4M

OR

2. a) Simplified the following Boolean function. To a minimum no of literals.
   i) x + x'y
   ii) x(x'+y)
   iii) xy + x'z + yz . 9M
   b) Explain about Sum of Min-terms and Product of Max-terms with suitable examples. 5M

UNIT–II

3. a) Simplify the Boolean function
   F(A,B,C,D) = Σ(0,2,5,8,9,13,15) and DO-CARE condition
   D(A,B,C,D) = Σ(1,7,14) 9M
   b) Implement the above simplified function using NAND and NOR. 5M

OR

4. a) Explain don't-care condition. 4M
   b) Implement AND, OR, and NOT gates using Universal Gates. 6M
   c) Describe EX-OR function with an example. 4M

UNIT–III

5. a) What is a Multiplexer? Explain it. 5M
   b) Construct 16x1 Multiplexer using 4x1 Multiplexers. 9M

OR

6. a) What is a combinational Circuit? Explain it. 7M
   b) Implement Full adder Combinational Circuit. 7M

UNIT–IV

7. a) What is a Sequential Circuit? 4M
   b) Differentiate Latches and Flip-Flops. 4M
   c) Describe JK Flip-Flops. 6M

OR

8. Implement 4-bit synchronous counter with a neat diagram. 14M

UNIT–V

9. Write short notes on
   i) ROM
   ii) Programmable Logic Array 14M

OR

10. Explain the following
    i) RAM
    ii) Error Detection and correction 14M

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Hall Ticket Number :										

R-15

Code: 5G131

II B.Tech. I Semester Regular Examinations November 2016

Advanced Data Structures Through C++

(Common to CSE & IT)

Max. Marks: 70 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70Marks)

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UNIT–I

1. a) What is a Function? Discuss about various parameter passing methods in C++. 10M
   b) Write short notes on Friend Function. 4M

OR

2. a) Explain in detail about Exception Handling Mechanism with an example. 9M
   b) Discuss about Dynamic Memory Allocation and De allocation 5M

UNIT–II

3. a) Differentiate between Constructor Overloading and Function Overloading 8M
   b) Discuss in detail about Polymorphism 6M

OR

4. a) What is inheritance? Explain the different types of inheritance with examples. 10M
   b) Write an algorithm for Bubble sort. 4M

UNIT–III

5. a) What is a Stack ADT? Write the ADT implementation of Stacks in C++. 7M
   b) What is a Queue ADT? Explain the various Operations of Queue with an example. 7M

OR

6. a) Explain the various operations of Dictionaries with an example. 10M
   b) Compare and contrast between Chaining and Open Addressing. 4M

UNIT–IV

7. a) What is a Binary Tree? Explain in detail about Binary Trees Traversals with an example. 6M
   b) Construct Max heap and Min Heap for the following data.
   20,15,95,60,35,43,12,75,34,59 8M

OR

8. a) Explain in detail about Binary Search Trees and its operations. 7M
   b) What is an AVL tree? Discuss the various rotations of AVL Trees. 7M

UNIT–V

9. a) Discuss about Splay Trees with an example 8M
   b) What is a B-Tree? Explain the various operations of B-Trees. 6M

OR

10. Explain in detail about ant two Fixed pattern Matching Algorithms 14M

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Hall Ticket Number :										

R-15

Code: 5G431

II B.Tech. I Semester Regular Examinations November 2016

Discrete Mathematics

(Common to CSE & IT)

Max. Marks: 70 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)

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UNIT–I

1. a) Prove that $p \rightarrow (q \rightarrow r)$ and $(p \wedge \neg r) \rightarrow \neg q$ are logically equivalent

   b) Prove that the following is a valid argument:

$$(p \Rightarrow q) \vee r \equiv (p \vee r) \Rightarrow (q \vee r)$$

OR

2. a) If P, Q and R are three atomic variables, obtain the principal disjunctive normal form for $(P \rightarrow (Q \wedge R)) \vee (\sim P \rightarrow (Q \vee R))$

   b) Examine the validity of the following argument. "If prices are higher than wages are high. Prices are high or there are price controls. If these are price controls then there is not an inflation. There is an inflation therefore wages are high.

UNIT–II

3. a) Define group, monoids, semi groups and subgroups.

   b) Define cyclic group, permutation group and dihedral group.

OR

4. a) Prove that

   b) If function f is one-one onto then inverse of f i.e

UNIT–III

5. a) Prove that theorem 'If X is an odd integer, x^2 is odd integer.

   b) Prove that in a room of 13 people, 2 or more people have their birthdays in the same month.

OR

6. a) Show that 1+2+3+… +n = for all integer, n≥1 by the principle of mathematical induction.

   b) Prove that 5^n+3 is divisible by 4 for all integers $n \geq 0$.

UNIT–IV

7. Solve the recurrence relation $a^n - 4a^{n-1} + 3a^{n-2} = 0$ for n >= 2 with initial conditions $a_0 = 2$ and $a_1 = 4$ by using generating functions.

OR

8. Solve the recurrence relation

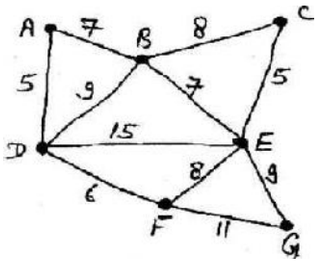
UNIT–III

9. a) Define union, intersection and product of two graphs.

   b) A simple graph with n vertices and k components cannot have (n–k)(n–k +1) more than edges.

OR

10. a) Find the minimal spanning tree of the following weighted graph



   b) If a connected graph G is Eulerian then every vertex of G has even degree.

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