Hall Ticket Number :										

R-15

Code: 5G236

II B.Tech. I Semester Supplementary Examinations November 2018

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) Define the terms
   i) Electric Current ii) Potential Difference iii) Electric Power iv) Energy 8M
   b) Three capacitors of 2 mF, 5 mF and 10 mF are connected in series. Find the equivalent capacitance. 6M

OR

2. a) How the Network elements can be classified. Explain it clearly with a suitable example. 7M
   b) Three resistances of 4Ω, 5Ω & 6Ω are connected in delta determine the resistances for an equivalent star connection. 7M

UNIT–II

3. a) Derive the emf equation of DC generator. 7M
   b) A 4-pole, lap wound, DC generator has a useful flux of 0.07Wb per pole, armature consists of 440 numbers of conductors. Calculate the generated emf when it is rotated at a speed of 900 rpm with the help of prime mover. 7M

OR

4. Explain classification of a DC generator along with suitable diagrams and voltage and current relationship. 14M

UNIT–III

5. a) Explain the various losses that occur in single phase transformer. 7M
   b) Describe the production of RMF in three phase induction motor. 7M

OR

6. a) A 2500/250 V, 25 KVA has a core losses of 130W & full load copper losses of 320W. Calculate the efficiency of full load when it is operating at 0.8 PF lagging? 7M
   b) Explain the working principle of three phase alternator. 7M

UNIT–IV

7. A Bridge rectifier is applied with input from a step down transformer having turns ratio 8 : 1 and input 230 V,50 Hz. If the R_f = 1 Ω, Rs = 10 Ω and R_L= 2 K Ω. Find a) DC Power output b) % of Efficiency c) % Regulation at full load c) PIV across the each diode. 14M

OR

8. a) Explain the working of N-P-N transistor and mention its input-output characteristics. 7M
   b) Explain in detail about frequency response of CE amplifier. 7M

UNIT–V

9. Explain the principle of CRT with a neat sketch. 14M

OR

10. Explain the principle & theory of induction heating with necessary diagrams and list out the industrial application of induction heating. 14M

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Hall Ticket Number :										

R-15

Code: 5GC33

II B.Tech. I Semester Supplementary Examinations November 2018

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 = 70 Marks)

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UNIT–I

1. a) Find the probability of getting a sum of 10 if we throw two dice

   b) A random variable X has the following probability function

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

   (i) Find the value of K

   (ii) Evaluate p(0<X<5)

   (iii) Evaluate p(X<6)

OR

2. a) If P(A) = $\frac{1}{2}$, P(B) = $\frac{1}{3}$ and P(A∩B) = $\frac{1}{5}$ then find (i) P(AUB) (ii) $P(A^c \cap B)$

   (iii) $P(A \cap B^c)$ (iv) $P(A^c \cap B^c)$

   b) Find the continuous probability function $f(x)=k\,x^2\,e^{-x}$ when x≥ 0 find

   (i) k (ii) mean (iii) variance

UNIT–II

3. a) For a normally distributed variate with mean 1 and standard deviation 3, find the probabilities that (i) 3.43 ≤ x ≤ 6.19 (ii) -1.43 ≤ x ≤ 6.19

   b) Six dice are thrown 729 times. How many times do you expect at least three dice to show a 5 or 6?

OR

4. a) In a normal distribution, 7% of the items are under 35 and 89% are under 63. Determine the mean and variance of the distribution.

   b) 2% of the items of a factory are defective. The items are packed in boxes. What is the probability that there will be (i) 2 defective items (ii) at least 3 defective items in a box of 100 items

UNIT–III

5. A population consists of 5 numbers 2, 3, 6, 8 and 11. Consider all possible samples of size 2 that can be drawn with replacement from this population. Find

   (i) The mean of the population

   (ii) The standard deviation of the population

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

   The standard deviation of the sampling distribution of means

OR

6. A random sample of size 64 is taken from a normal population with μ = 51.4 and σ = 68. What is the probability that the mean of the sample will

   (i) exceed 52.9

   (ii) fall between 50.5 and 52.3

   (iii) be less than 50.6

UNIT–IV

7. a) In a sample of 1,000 people in Karnataka 540 are rice eaters and the rest are wheat eaters. Can we assume that both rice and wheat are equally popular in the state at 1% level of significance

   b) If 80 patients are treated with an antibiotic 59 got cured. Find a 99% confidence limits to the true population of cure

OR

8. a) A sample of 400 items is taken from a population whose standard deviation is 10. The mean of the sample is 40. Test whether the sample has come from a population with mean 38. Also calculate 95% confidence interval for the population

   b) In a random sample of 125 cola drinkers, 68 said they prefer Thumsup to Pepsi. Test the null hypothesis P = 0.5 against the alternative hypothesis P > 0.5

UNIT–V

9. A sample analysis of examination results of 500 students was made. It was found that 220 students had failed, 170 had secured a third class, 90 were placed in second class and 20 got a first class. Do these figures commensurate with the general examination result which is in the ratio of 4:3:2:1 for the various categories respectively

OR

10. In an investigation on the machine performance, the following results are obtained

	No. of units inspected	No. of defectives
Machine I	375	17
Machine II	450	22

Test whether there is any significant performance of two machines at $\alpha = 0.05$

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Hall Ticket Number :										

R-15

Code: 5G133

II B.Tech. I Semester Supplementary Examinations November 2018

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) What are the reasons for studying concepts of Programming Languages? 9M

   b) Describe the basic concept of Denotational Semantics? 5M

OR

2. a) Write down BNF rules for '**if-then-else'** statement and Convert the obtained ambiguous grammar into unambiguous grammar for the same. 8M

   b) What are three general methods of implementing a Programming Language? 6M

UNIT–II

3. a) Define Strong typing. Write and explain about Type compatibility 7M

   b) What are the design issues for Pointer type? 7M

OR

4. a) Define Heterogeneous Array? Discuss the design issues of Arrays? 7M

   b) Discuss Structural and Name equivalence for types? Give an example of a language used for each approach 7M

UNIT–III

5. a) Define the following terms: **formal parameters, actual parameters, positional parameters and keyword parameters?** 8M

   b) Write a brief note on 'Iterative statements'? 6M

OR

6. a) List what advantages does Java's break statement have over C's and C++'s break statement? 7M

   b) Explain about Unconditional Statements and Guarded commands with suitable examples? 7M

UNIT–IV

7. a) List out the features of Abstract Data types? 7M

   b) Differentiate Java packages and C++ namespaces? 7M

OR

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

   b) How Concurrency is achieved using Semaphores? 7M

UNIT–V

9. a) Write and explain about Fundamentals and Applications of Functional languages? 6M

   b) State and explain about the Basic elements of Prolog with suitable examples? 8M

OR

10. a) Explain why Prolog systems must do Backtracking? Explain how Backtracking works in Prolog? 8M

    b) Compare the Functional languages with Imperative languages? 6M

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Hall Ticket Number :										

R-15

Code: 5G132

II B.Tech. I Semester Supplementary Examinations November 2018

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 = 70 Marks)

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UNIT–I

1. a) i. Solve the following.
   i.i) $(2BC.A)_{16}$ = (_____)$_8$ i.ii) $(ABC.25)_{16}$ = (_____)$_2$. i.iii) $(AF0)_{16}$ = (_____)$_2$
   ii) What is self complementary code? Explain with the example 7M

   b) i) Expand $A + B\bar{C} + AB\bar{D} + ABCD$ to min terms and max terms.
   ii) State commutative law and associative law 7M

OR

2. a) i) Perform the following using 2's complement.
   i.i) 11010 – 1101 i.ii) 101011 – 100110
   ii) Realize NAND Gate using OR Gates 7M

   b) i) Obtain the truth table for the function F = xy + xy' + y'z
   ii) Prove that the sum of all min terms of a Boolean function for three variables is 1. 7M

UNIT–II

3. a) Obtain the minimal SOP expression for $\Sigma m(2,3,5,7,9,11,12,14,15)$ and implement using NAND gates. 10M

   b) i) Why are NAND and NOR gates called universal gates?
   ii) Implement Full-adder using NAND gates only. 4M

OR

4. a) Simplify the following Boolean expressions using K-map and implement them using NAND gates:
   F(W, X, Y, Z) = XZ + WXY + WXY + WYZ + WYZ. 10M

   b) Implement Ex-OR gate using NoR gates. 4M

UNIT–III

5. a) Implement a Full-adder using two half adder and one OR gate. 7M

   b) Implement the function f (a,b,c) = Σ m(1,3,5,6) using 4x1MUX. 7M

OR

6. a) Design and implement a two bit comparator using logic gates. 7M

   b) With neat diagram, explain 3 to 8 line decoder. 7M

UNIT–IV

7. a) Draw the circuit diagram of S-R Flip-flop with NAND gates and explain its operation with the help of a truth table. 7M

   b) Convert SR Flip-Flop to JK Flip-Flop. 7M

OR

8. a) Define a register. Construct a shift register from S-R flip-flops. Explain its working. 7M

   b) Draw the excitation table of SR, T and D-flip flop. 7M

UNIT–V

9. a) Implement the two Boolean functions with a PLA.
   F1(A,B,C) = $\Sigma m(0,2,3,6)$ F2(A,B,C) = $\Sigma m(1,2,5,6)$ 7M

   b) Design a synchronous mod-6 counter using JK flip-flop. 7M

OR

10. a) Design a mod-8 synchronous counter using D flip-flops. Give all the steps. 8M

    b) Compare programmable logic devices PROM, PLA and PAL. 6M

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