Hall Ticket Number :										

R-11/R-13

Code : 1G132

II B.Tech. I Semester Supplementary Examinations May/June 2016

Digital Logic Design

(Computer Science & Engineering)

Max. Marks: 70 **Time: 03 Hours**

Answer *any five* questions

All Questions carry equal marks (14 Marks each)

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1. Convert
   - **a)** 23.625 to octal
   - **b)** 235.2 to radix 4
   - **c)** 95.0625 to binary. 14M

2. a) Find the Demorgan equivalent to G = u + v w' + x(y' + z) 7M
   b) Draw the logic diagram for the following switching equations using only NOR gates. Use IEEE symbols.
   K_1 = w' x + x z + y z'
   K_2 = x' y' + x z + w' x'
   K_3 = y z' + x' y 7M

3. a) Simplify the following three variable equation P= f(r,s,t,u) = ∑ (1,3,4,6,9,11,12,14). 4M
   b) Find the product functions for the following multiple output functions
   X = f(a,b,c) = ∑(1,2,3,7)
   Y = f(a,b,c) = ∑(1,2,3,6)
   Z = f(a,b,c) = ∑(2,4,6) 10M

4. a) Draw the logic diagram for i) a binary full subtractor ii) Look-ahead carry. 10M
   b) Implement a full subtractor using 4:1 multiplexers. 4M

5. a) Explain edge triggered Flip Flops with timing diagram. 6M
   b) Explain divide by 8 counter with timing diagram. 8M

6. a) Explain deriving flow tables with an example. 8M
   b) Explain the difference between fundamental and pulse mode Asynchronous circuits. 6M

7. a) Explain the difference between PROM and EPROM. 4M
   b) Explain PAL with an example. 10M

8. a) Explain various state machine notations. 6M
   b) Explain the procedure for state classification to determine n-equivalence with an example. 8M

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Hall Ticket Number :										

R-11/R-13

Code : 1G235

II B.Tech. I Semester Supplementary Examinations May/June 2016

Basic Electrical Engineering

(Common to CSE & IT)

Max. Marks: 70 **Time: 03 Hours**

Answer *any five* questions

All Questions carry equal marks (14 Marks each)

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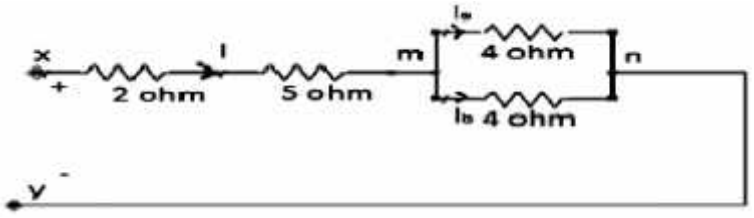
1. a) State and explain Ohm's law? 6M

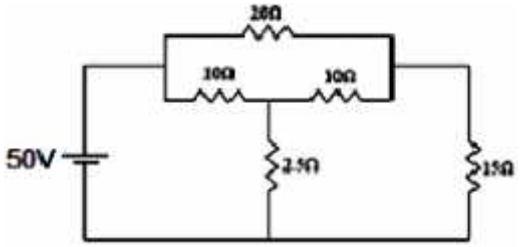
   b) Calculate the voltage that is to be connected across terminal x-y in figure such that the voltage across the 2 ohms resistor is 5V. Also find I_a and I_b. what is the total-power loss in the circuit?



8M

2. a) State and explain Thevenin's Theorem 7M

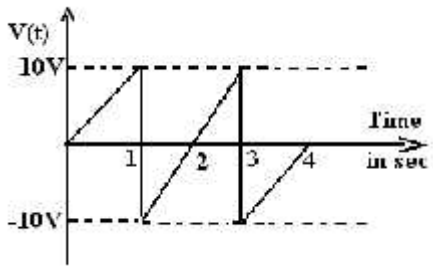
   b) Find Current through 15Ω resistor using Thevenin's Theorem.



7M

3. a) Derive expression for r.m.s. and average value of a sinusoidal alternating quantity. 7M

   b) Find RMS and average value of voltage waveform shown in figrure.Also find form factor and peak factor.



7M

4. a) Derive the relation between phase and line values of a 3-phase balanced star connected system. 7M

   b) Three impedances each of (5+j12) ohm are connected in star to a 220V, 3-phase, and 50 Hz supply. Calculate the line currents 7M

5. a) Explain constructional features of a DC generator? 8M

   b) The Armature of a 6 pole D.C generator has a wave winding containing 664 conductors. Calculate Generated E.M.F When Flex per Pole Is 0.06 wb and speed Is 250 R.P.M. at what Speed must the Armature be Driven to generate an emf of 250 If the flex per pole is reduced to 0.58 wb? 6M

6. a) Explain the tests to be conducted to determine copper and iron losses with neat circuit Diagram. 7M

   b) A 200 / 400V, 50Hz 1 phase transformer on test gave following readings:
   O.C (l.v): 200V, 0.7A, 70W, S.C (h.v): 15V, 10A, 80W. Find efficiency at 0.8 p.f lagging at full load. 7M

7. a) How is a rotating magnetic field produced in a three phase induction motor? Explain in detail with relevant phasors. 7M

   b) Give the difference between an induction motor and a transformer. 7M

8. a) Explain with neat sketch the air friction damping 6M

   b) Explain with neat sketch the construction and working of a MI type Voltmeter. 8M

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Hall Ticket Number :										

R-11/R-13

Code : 1G131

II B.Tech. I Semester Supplementary Examinations May/June 2016

Advanced Data Structures Through C++

(Common to CSE & IT)

Max. Marks: 70 **Time: 03 Hours**

Answer *any five* questions

All Questions carry equal marks (14 Marks each)

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1. a) Define class? Explain various object oriented programming features. 7M
   b) What are constructors and destructors? Explain how they differ from normal functions? Illustrate with an example 7M

2. a) Define Exception handling? Explain the concept of operator overloading with example. 7M
   b) What is need for Virtual Base Classes? Explain with suitable example. 7M

3. a) Explain about time complexity and space complexity ?how we can measure the performance of an algorithm 7M
   b) Convert infix to prefix ((A*B) *((C/D)-(E * (F*G)))) 7M

4. Define Hash Table? Discuss in detail about collision resolution technique? 14M

5. a) Define and explain in detail about Priority Queue ADT. 4M
   b) Define Heap Sort and its Algorithm. Consider the array 25,19,15,13,12,4,6,7,1,3,9. How the array can be sorted using heap sort. 10M

6. a) What is Binary Search Tree? Explain insertion deletion with example and program. 7M
   b) Define Binary Tree? Explain about Binary Tree Traversal Technique With suitable Example. 7M

7. a) Explain about Red black Tree With Example. 7M
   b) Explain about Splay Tree With Example. 7M

8. a) Write and explain the Boyer-Moore algorithm. 7M
   b) What are the properties of Compressed and Suffix tries. 7M

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Hall Ticket Number :										

Code : 1GC33

R-11/R-13

II B.Tech. I Semester Supplementary Examinations May/June 2016

Probability & Statistics

(Computer Science & Engineering)

Max. Marks: 70 **Time: 03 Hours**

Answer *any five* questions

All Questions carry equal marks (14 Marks each)

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1. a) Write merits and demerits of Median 6M

   b) If X and Y are standardized random variables and

   $$r(aX + bY, bX + aY) = \frac{1+2ab}{a^2+b^2},$$

   then find $r(X,Y)$, the coefficient of correlation between X and Y. 8M

2. a) If A and B are any two events in a sample space 'S' then Prove that (**i**) $P(A^c \cap B) = P(B) - P(A \cap B)$ (**ii**) $P(A \cap B^c) = P(A) - P(A \cap B)$. 6M

   b) The Probabilities of X, Y and Z becoming managers are 4/9, 2/9 and 1/3 respectively. The probabilities that the Bonus Scheme will be introduced if X, Y and Z becomes managers are 3/10 , 1/2 and 4/5 respectively (**i**) What is the probability that Bonus Scheme will be introduced (**ii**) if the Bonus Scheme has been introduced , what is the probability that the manager appointed was X . 8M

3. a) A random variable x has the following probability distribution

x	1	2	3	4	5	6	7	8
f(x)	k	2k	3k	4k	5k	6k	7k	8k

   Find the value of (**i**) k (**ii**) p (x ≤ 2) (**iii**) p (2 ≤ x ≤ 5) 7M

   b) If $f(x) = k\, e^{-1x1}$ is p. d. f in $-\infty < x < \infty$ then find (i) the value of k (ii) P(0 ≤ x ≤ 4) 7M

4. a) Show that mean and variance of a Binomial distribution is np and npq. 7M

   b) If x is a normal variate with mean 30 and S.D 5 then find **(i)** P(26 ≤ x ≤ 40) and **(ii)** P(x ≥ 45). 7M

5. a) If sample of size 65 is taken from a population whose standard deviation is 12 then find **i)** standard error of mean of sampling distribution **ii)** probable error. 7M

   b) A random sample of size 100 is taken from an infinite population having the μ=76 and the variance $\sigma^2 = 256$. What is the probability that $\bar{x}$ will be between 75 and 78 7M

6. a) What is the maximum error one can expect to make with probability 0.9, when using the mean of a random sample of size n = 64 to estimate the mean of a population with $\sigma^2 = 2.56$. 4M

   b) A coin is tossed 10,000 times and it turns up head 5195 times. Discuss whether the coin may be regarded as unbiased one. 10M

7. a) Explain Critical Region and Level of Significance 6M

   b) A simple sample of heights of 6400 Englishmen has a mean of 67.85 inches and S.D. 2.56 inches, while a simple sample of heights of 1,600 Australians has a mean of 68.55 inches and a S.D. of 2.52 inches. Do the data indicate that Australians are on the average, taller than Englishmen 8M

8. Fit a Poisson distribution to the following data and test the goodness of fit at a 0.5 level of significance

x	0	1	2	3	4	5	6	7
f	305	366	210	80	28	9	2	1

14M

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Hall Ticket Number :										

Code: 1G334 **R-11 / R-13**

II B. Tech. I-Semester Supplementary Examinations May/June 2016

Electronic Devices and Circuits

(Common to CSE & IT)

Max. Marks: 70 **Time: 03 Hours**

Answer *any five* questions
All Questions carry equal marks (14 Marks each)
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1. a) Distinguish between Zener and avalanche breakdown mechanisms 7M
   b) The voltage across a silicon diode at room temperature of 300^0K is 0.71V when 205mA current flows through it. If the voltage increases to 0.8V, calculate the new diode current. 7M
2. a) With neat diagram explain the working principle of a zener voltage regulator. 7M
   b) For a zener shunt regulator if V_s=10V,R_s=1KΩ,R_L=10KΩ, and input voltage varies from 25V to 40V. Find the maximum and minimum values of zener current. 7M
3. a) Define amplifier? Explain how a transistor acts as an amplifier with the help of circuit diagram. 7M
   b) Compare CB, CE, CC configurations with respect to current gain, voltage gain, input resistance and output resistance. 7M
4. a) Draw the collector to base bias circuit with BJT and derive the equations/ expressions for stability factor. 7M
   b) Design a fixed bias circuit using a Si transistor having β value of 100. V_{CC} is 10V and dc bias conditions are to be V_{CE} = 5V and I_C = 5mA. 7M
5. a) Explain the construction and operation of N-channel depletion type MOSFET with neat sketch. 8M
   b) Explain how FET acts as Voltage Variable Resistor.(VVR) 6M
6. a) Define class-B amplifier? Derive the expression for efficiency of push-pull class-B amplifier. 7M
   b) Prove that the maximum efficiency of a series fed, directly coupled class-A amplifier is 25%. 7M
7. a) Explain the general characteristics of negative feedback amplifier? 7M
   b) Classify the amplifiers based on the magnitudes of the input impedance and output impedance of an amplifier relative to the source and load impedance and explain. 7M
8. a) Derive an expression for frequency of oscillations of colpitts oscillator using BJT. 8M
   b) In a transistorized Hartely oscillator the two inductances are 2mH and 20μH, while the frequency is to be changed from 950KHz to 2050KHz.Calculate the range over which the capacitor is to be varied. 6M

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Hall Ticket Number :										

R-11/R-13

Code : 1G133

II B.Tech. I Semester Supplementary Examinations May/June 2016

Mathematical Foundations of Computer Science

(Common to CSE & IT)

Max. Marks: 70 **Time: 03 Hours**

Answer *any five* questions
All Questions carry equal marks (14 Marks each)

****

1. a) Show That (~P Λ (~Q Λ R)) V (Q Λ R) V (P Λ R) ⇔ R. 7M
   b) Show that { Λ , V}, {V}, and { ~ } are not functionally complete 7M

2. a) Show that R V S follows logically from the premises C V D, (C V D)→ ~H, ~H → (A Λ ~ B) and (A Λ ~ B) → (R V S) 7M
   b) Show that (x)(P(x) V Q(x)) ==> (x)P(x) V (∃x) Q(x)) 7M

3. a) Let A={1,2,3,4}, and R={(1,1),(1,2),(2,2),(2,4),(1,3),(3,3),(3,4),(1,4),(4,4)}. Verify that R is a partial order on A. Also, write down the Hasse diagram for R. 7M
   b) Show that the functions $f(x)=x^3$ and $g(x)= x^{1/3}$ are inverses of one another. 7M

4. State and prove Lagrange's theorem 14M

5. a) State and prove Binomial theorem 10M
   b) Find the coefficient of x^9y^3 in the expansion of $(2x-3y)^{12}$ 4M

6. a) Solve the recurrence relation $a_n-6a_{n-1}+9a_{n-2}=0$ for n>=2 7M
   b) Solve the recurrence relation $a_{n+2}-10a_{n+1}+21a_n=3n^2-2$, n>=2 7M

7. a) Define Minimal Spanning tree. Write Kruskal's algorithm to construct minimal spanning tree 7M
   b) Write an application of stack in graphs 7M

8. a) Prove that the complete bipartite graph $K_{3,3}$ is Hamiltonian but not Eulerian 7M
   b) Prove that every connected simple planar graph G is 6-colorable 7M

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