Hall Ticket Number :										

R-11 / R-13

Code : 1G235

II B.Tech. I Semester Supplementary Examinations Nov/Dec 2015

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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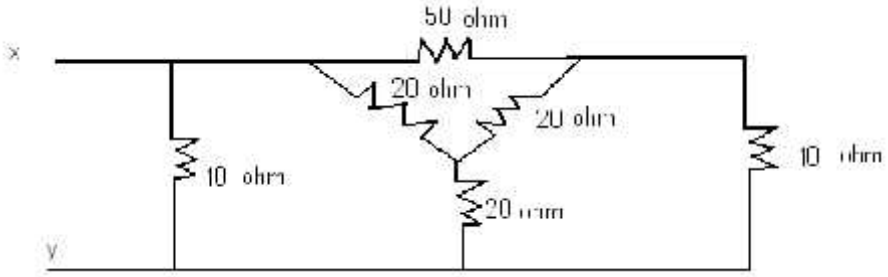
1. a) Explain the following terms:
   i. Charge
   ii. Electric potential
   iii. Potential difference
   iv. Electric current 8M

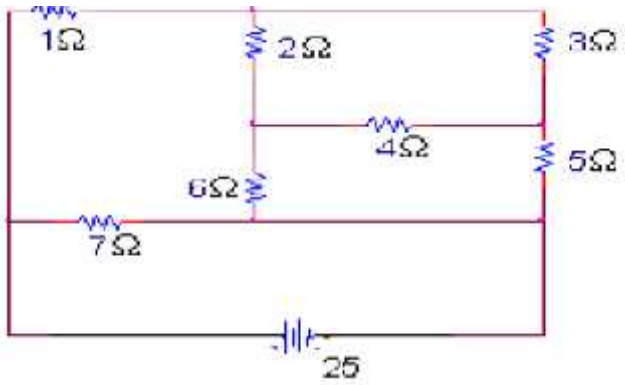
   b) Find the source current in figure below?



6M

2. a) Define and explain Kirchhoff's law 7M

   b) Find the current through and the voltage across all the elements by using Kirchhoff's laws as shown in figure



7M

3. a) Derive the expressions for ac through series RC circuit. 7M

   b) Calculate the resistance and inductance or capacitance in series for each of the following impedances assumes the frequency to be 60 Hz. (**i**) 12+j30 ohms, (**ii**) –j60 ohms (**iii**) $20\angle 60^0$ ohms 7M

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

   b) Three impedances (3+j4) ohm, (5+j0) ohm and (2-j2) ohm are connected in delta to a 100V, 3- phase, and 50Hz balanced supply. Calculate the line currents and total power consumed 7M

5. a) Explain different methods of excitation of D.C generators with suitable diagrams. 10M

   b) What is the Significance of The Back E.M.F of a D.C motor? 4M

6. a) Define voltage regulation and efficiency of a transformer. Deduce the expression for the voltage regulation with lagging power factor. 7M

   b) The iron and full load copper loss in a 40KVA 1 phase transformer are 450 W and 850 W respectively. Find

      i. Efficiency at full load when the power factor of the load is 0.8 lagging

      ii. The maximum efficiency and

      iii. The load at which the maximum efficiency occurs. 7M

7. a) Explain the working principle of three phase induction motor. 7M

   b) A 6 pole induction motor is fed by three phase 50HZ supply and running with a full load slip of 3%. Find the full load speed of induction motor and also the frequency of rotor emf. 7M

8. a) Explain with neat sketch the construction and working of MC type instrument. 7M

   b) Write the errors occurring in a moving coil instrument 7M

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M.M.V. Chalapathi

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Hall Ticket Number :										

Code : 1G131 **R-11 / R-13**

II B.Tech. I Semester Supplementary Examinations Nov/Dec 2015

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 about inline function with Example. 6M
   b) Explain about dynamic memory allocation and de-allocation 8M

2. a) Explain the concept of function overloading and operator overloading with an example. 7M
   b) Explain Base Class and Derived Class with Example. 7M

3. a) Define Abstract Data Type? Explain the implementation of stack ADT in details. 7M
   b) How we can measure the performance of an algorithm? Discuss in detail. 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) Explain about external sorting and Multi way merge. 10M

6 a) Define AVL Trees? Explain various steps for AVL search tree insertion with illustrations. 5M
   b) Define Binary Tree? Explain Binary Tree Traversal with below example.
   Preorder: A B D G C E H I F, In-order: D B G A H E I C F. Construct post order. 9M

7. a) Describe insertion operation of a B-tree with an example. 7M
   b) Explain about splay trees. 7M

8. a) Write and explain the Knuth-Morris-Pratt algorithm with suitable algorithm. 7M
   b) Write and explain Brute force algorithm. 7M

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Hall Ticket Number :										

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

II B.Tech. I Semester Supplementary Examinations Nov/Dec 2015

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) Draw the energy band diagram of PN junction diode under open circuit condition and explain. 10M

   b) Find the value of dc resistance and ac resistance of a Ge diode at 25^0c with I_c = 25μA and at an applied voltage of 0.2V across the diode. 4M

2. a) Derive the expression for the following using FWR:
      i) Average DC current (I_{DC})
      ii) Average DC voltage (V_{DC})
      iii) Ripple factor(γ)
      iv) Efficiency(η) 8M

   b) A full wave rectified voltage of 18V peak is applied across a 500μF capacitor filter. Calculate the ripple factor if load takes a average current of 100mA.Assume supply frequency 50Hz. 6M

3. a) Draw the circuit diagram of a BJT in CB configuration and explain its input and output characteristics with neat sketch. 10M

   b) Calculate the value of I_C and I_E for a transistor with α_{dc} = 0.99 and I_{CBO} = 5μA, I_B is measured as 20μA. 4M

4. a) Define the following: i) S ii) S^1 iii) S^{11} 6M

   b) Give the analysis of a voltage –divider bias and derive the expression for stability factor. 8M

5. a) Explain the construction and operation of N-channel JFET with neat sketch. 8M

   b) Distinguish between BJT and FET. 6M

6. a) For CE configuration derive the expression for current gain (A_i), Voltage gain (A_v), input resistance (R_i) and output resistance (R_0) in terms of h-parameters. 7M

   b) Common collector amplifier having R_S=1KΩ, R_1=10KΩ, R_2=10KΩ, R_E=5KΩ, R_L=20KΩ, the transistor parameters are h_{ic}=1.2KΩ, h_{fc}= -101, h_{rc} = 1 and h_{oc} = 25μA/V. Calculate A_i, R_i, A_v and R_0. 7M

7. a) Draw the circuit diagram of a voltage series feedback amplifier and derive the expression for input resistance and output resistance. 7M

   b) Calculate the gain , input resistance and output resistance of voltage series feedback amplifier having A= -300,R_i=1.5KΩ,R_0=50KΩ, and β= -1/20 7M

8. a) Show that the gain of wien bridge oscillator using BJT amplifier must be at least 3 for the oscillation to occur. 8M

   b) A crystal oscillator has L=2H, C= 0.01pF and R=2KΩ.Its mounting capacitance is 2pF.Calculate it series and parallel resonating frequency. 6M

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Hall Ticket Number :										

Code : 1G133 **R-11 / R-13**

II B.Tech. I Semester Supplementary Examinations Nov/Dec 2015

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)

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1. a) Show that ((P V Q) Λ ~ (~ P Λ (~ Q V ~R))) V (~ P Λ ~Q) V (~P Λ ~R) is a tautology 7M

   b) Obtain the product-of-sums canonical forms of (P Λ Q Λ R) V (~P Λ R Λ Q) V (~P Λ ~ Q Λ ~ R) 7M

2. a) Show that the following premises are inconsistent
   i. If Jack misses many classes through illness, then he fails high school
   ii. If Jack fails high school, then he is uneducated
   iii. If Jack reads a lot of books, then he is not uneducated
   iv. Jack misses many classes through illness and reads a lot of books 7M

   b) Show that (x)(P(x)→Q(x)) Λ (x)(Q(x)→R(x)) ==> (x)(P(x)→R(x)) 7M

3. a) Let X={1,2,3,4,5,6,7} and R={(x,y)| x-y is divisible by 3}. Show that R is an equivalence relation. Draw the graph of R. 7M

   b) For the equivalence relation R={(1,1),(1,2),(2,1),(2,2),(3,4),(4,3),(3,3),(4,4)} defined on the set A={1,2,3,4}. Find the partition of A induced by R. 7M

4. a) For any elements a,b in a group G, we have (i) $(a^{-1})^{-1}=a$ (ii) $(ab)^{-1}=b^{-1}a^{-1}$ 7M

   b) Prove that the cube roots of unity form a group under the usual multiplication 7M

5. State and prove Pigeon hole principle. Give one application of pigeon hole principle 14M

6. a) Solve the Fibonacci recurrence relation 7M

   b) Solve the recurrence relation $a_n-3a_{n-1}=5*3^n$, $n>=1$, $a_0=2$ by the method of generating functions 7M

7. a) Show that the sum of the degrees of all the vertices in a graph is an even number and this number is equal to twice the number of edges in the graph. 7M

   b) Define Minimal Spanning tree. Write Prim's algorithm to construct minimal spanning tree 7M

8. a) Find the complement of the complete bipartite graph $K_{3,3}$ 7M

   b) Verify that the complete graph K_5 has cycles with lengths 3,4,5 7M

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