Hall Ticket Number :										

R-11/R-13

Code: 1G235

II B.Tech. I Semester Supplementary Examinations November 2016

Basic Electrical Engineering

(Common to CSE & IT)

Max. Marks: 70 Time: 3 Hours

Answer *any* ***five*** questions
All questions carry equal marks (14 Marks each)
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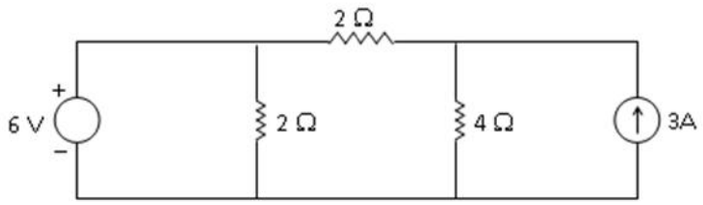
1. a) Explain the effect of Temperature on Resistance? 7M

   b) A circuit consisting of three resistances of 12Ω, 18Ω and 36Ω respectively joined in parallel is connected in series with a fourth resistance. The whole circuit is applied with 60V and it is found that the power dissipated in the 12Ω resistor is 36W. Determine the value of the fourth resistance and the total power dissipated in the circuit. 7M

2. a) State and explain maximum power transfer theorem. With an example. 6M

   b) Determine the current in resistor 4 Ω using superposition theorem as shown in figure.



8M

3. a) Define and explain **i)** RMS value, **ii)** Average value and **iii**) Form factor **iv**) peak factor. Also derive the expression of a sinusoidal wave 6M

   b) A resistance of 20Ω and an inductance of 0.2 H and a capacitance of 100 μF are connected in series across 220v, 50HZ mains. Determine: **(i)** impedance of the circuit. **(ii)** Current taken from the mains and **(iii)** power and power factor of the circuit. 8M

4. a) Derive the relation between phase and line values of a 3-phase balanced delta 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) Derive the emf equation of a dc generator 6M

   b) A 4 pole DC Generator has 378 conductors is its armature. If the flux per pole in 0.02wb and the generator runs at 1000rpm. Calculate the induced emf. If winding is connected in (i).lap winding (ii).wave winding 8M

6. a) Explain the constructional details of Transformer 7M

   b) The Maximum Flux Density the case of 250/3000v 50 C/S single phase Transformer is 1.2 wb /M^2. If The Emf per turn is 8volts determine **(i)** Primary turns **(ii)**Secondary turns **(iii)** Area of the core. 7M

7. a) Explain the principle of operation of 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) What are the basic requirements of indicating instrument? Briefly discuss them 7M

   b) Explain with neat sketch the principle of operator of permanent magnet type moving coil Instruments 7M

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Hall Ticket Number :										

R-11/R-13

Code: 1G334

II B.Tech. I Semester Supplementary Examinations November 2016

Electronic Devices and Circuits

(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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1. a) Explain the operation of zener diode and how it is used as a voltage regulator? 8M

   b) An ideal silicon diode has a static resistance of 4.57 Ω while conducting 42.5mA at T=300^{0}K. find the dynamic resistance of the diode for aforward voltage of 0.1V. 6M

2. a) Explain the principle of operation of HWR with and without capacitor filter and draw the waveforms? What is the necessity of filter circuit in a rectifier? Derive an expression for ripple factor with a capacitor filter? 6M

   b) A 230V, 50Hz voltage is applied to the primary of a 5:1 step down center-tapped transformer used in a full wave rectifier having a load of 900Ω. If the diode resistance and secondary coil resistance together has a resistance of 100Ω. Determine
      (i) DC Voltage across the load
      (ii) DC current flowing through the load
      (iii) DC power delivered to the load
      (iv) PIV across each diode 8M

3. a) With a neat diagram explain the various current components in a pnp transistor? 8M

   b) Compare the performance of at transistor in CE, CB and CC configuration? 6M

4. a) What is meant by thermal runaway and derive the condition for thermal stability in CE configuration? 6M

   b) Design a self-bias circuit, the Q-point is established at $V_{CE} = 12V$ and $I_C = 1.5mA\, so\, that\, S(I_{CO}) = 3.$ Assume =50, $V_{BE} = 0.7V, V_{CC} = 22.5V.$ 8M

5. a) Draw and explain the transfer characteristics of N channel JFET? 7M

   b) Define R_d, μ, g_m of JFET, and derive the relationship between them? 7M

6. a) Show that the maximum power conversion efficiency of class B push pull amplifier is 78.5%. 7M

   b) Derive the CC h-parameters in terms of CE h-parameters. 7M

7. a) Enumerate the effects of negative feedback on (**i**) Gain, (**ii**) Frequency response, (**iii**) Distortion, (**iv**) Noise and (**v**) input and out impedances 6M

   b) Calculate the voltage gain, input and output resistance of series shunt feedback configuration having open loop gain 300, Ri=1.5K Ω, Ro=50K Ωand =1/15. 8M

8. a) Explain the working of a Wien bridge oscillator Derive the expression for frequency of oscillations and the value of gain required for sustained oscillations. 8M

   b) Show that the frequency of oscillations of a colpitt's oscillator

   $w_o = \sqrt{\dfrac{RC_1 + R_0(C_1 + C_2)}{LC_1C_2R_0}}$ where R is the series resistance of an inductor $L.$ 6M

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Hall Ticket Number :										

R-11/R-13

Code: 1G131

II B.Tech. I Semester Supplementary Examinations November 2016

Advanced Data Structures Through C++

(Common to CSE & IT)

Max. Marks: 70 Time: 3 Hours

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

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1. a) Explain different parameter passing methods with suitable examples. 7M
   b) What is a constructor? Illustrate default and parameterized constructors with suitable examples. 7M

2. a) What is the need for operator overloading? Illustrate with an example how binary operator can be overloaded? 7M
   b) What is inheritance? Explain multiple and multi-level inheritance. 7M

3. a) What is run time polymorphism? Explain with suitable example how to implement it using virtual functions? 6M
   b) What is a template class? Write a C++ program to implement queue ADT using a template class. 8M

4. Consider a hash table of size 7 with hash function *h(k) = k mod 7.* Draw the table that results after inserting, in the given order, the following key values;

   19, 26, 13, 48, 17

   i) When collisions are handled by **linear probing**
   ii) When collisions are handled by **double hashing** using a second hash function $h^1(k) = 5 - (k \bmod 5)$
   iii) When collisions are handled by **separate chaining** 14 M

5. a) What is a priority queue? Explain how it can be realized using a heap data structure? 8M
   b) What is external sorting? Explain with suitable example polyphase merge sort. 6M

6. a) Create an AVL tree using the following data entered in the given order.

   7, 10, 14, 23, 33, 56, 66, 70, 80 8M
   b) What is a binary tree? Explain binary tree traversals with an example. 4M

7. a) Construct a B-tree of order 4 for the following data entered in the sequence;

   92, 24, 6, 7, 11, 8, 22, 4, 5, 16, 19, 20, 78 8M
   b) What is a red black tree? Explain how it differs from a binary search tree? 6M

8. a) Write and explain Boyer–Moore pattern matching algorithm with suitable algorithm. 8M
   b) Distinguish between Standard Tries and Compressed Tries. 6M

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Hall Ticket Number :										

R-11/R-13

Code: 1G133

II B.Tech. I Semester Supplementary Examinations November 2016

Mathematical Foundations of Computer Science

(Common to CSE & IT)

Max. Marks: 70 Time: 3 Hours

Answer any ***five*** questions
All Questions carry equal marks (14 Marks each)
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1. a) Prove that $p \rightarrow (q \rightarrow r)$ and $(p \wedge \neg r) \rightarrow \neg q$ are logically equivalent 7M
   b) If P, Q and R are three atomic variables, obtain the principal disjunctive normal form for $(P \rightarrow (Q \wedge R)) \vee (\sim P \rightarrow (Q \vee R))$ 7M

2. Prove that the following is a valid argument:
   $$(p \Rightarrow q) \vee r \equiv (p \vee r) \Rightarrow (q \vee r)$$
   14M

3. a) Consider the set A = {2, 7, 14, 28, 56, 84} and the relation a b if and only if a divides b. Give the Hasse diagram for the poset $(A, \leq)$ 14M

4. a) Let $\varphi: G \rightarrow H$ be an isomorphism. Show that $\varphi^{-1}: H \rightarrow G$ is an isomorphism. 7M
   b) Let G be the cyclic group of order 12. How many subgroups of G have order 3? Explain. 7M

5. a) Among integers 1 to 1000, How many of them are not divisible by 3 nor by 5 nor by 7? 7M
   b) Show that $1^2-2^2+3^3+\ldots.+(-1)^{n+1}n^2=(-1)^{n+1}(n)^{n+1}/2$ 7M

6. Solve the recurrence relation $a^n - 4\ a^{n-1} + 3\ a^{n-2} = 0$ for n >= 2 with initial conditions $a_0 = 2$ and $a_1 = 4$ by using generating functions. 14M

7. What are the steps involved in graph traversal using Breadth-First Search algorithm? Illustrate with an example. 14M

8. What is the chromatic number of a cycle graph and a complete graph of n vertices? 14M

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