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ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES :: RAJAMPET
(AUTONOMOUS)

II B.Tech I Semester Supplementary Examinations June/July 2014

Digital Logic Design and Computer Organization

(Information Technology)

Time: 3 hours   **Max Marks: 70**

Answer any FIVE of the following

All questions carry equal marks (14 Marks each)

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1.	a)	Write short notes on Multi Computers.	7M
	b)	Convert the following decimal numbers to base indicated.	7M
		i. 7163 to octal	
		ii. 1762 to hex decimal	
2.	a)	List the truth table of a three-variable XOR function.	7M
	b)	Explain Don't-Care Conditions in detail.	7M
3.	a)	Explain De-Multiplexers in detail.	7M
	b)	Write short notes on Binary Counters.	7M
4.	a)	Devise an algorithm for fixed point subtraction representation.	7M
	b)	Represent the number $(+43.2)_{10}$ as a floating point binary number with 32 bits.	7M
5.	a)	Explain Relative Address Mode with an example.	7M
	b)	Write a program to evaluate the arithmetic statement X = (A+B) * (C+D) using a general register with two address instructions.	7M
6.	a)	Write short notes on Register Transfer Language.	7M
	b)	Explain Hardwired Control Organization.	7M
7.	a)	Differentiate between Static RAM and Dynamic RAM.	7M
	b)	Explain Virtual Memory in detail.	7M
8.	a)	What is the difference between Isolated I/O and Memory-Mapped I/O.	7M
	b)	Write short notes on DMA Transfer.	7M

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ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES :: RAJAMPET
(AUTONOMOUS)
II B.Tech. I Semester Supplementary Examinations June/July 2014
Advanced Data Structures Through C++
(Common *to CSE & IT*)

Max. Marks: 70   Time: 03 Hours
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Answer *any five* questions
All Questions carry equal marks (14 Marks each)

1. a) Explain about constructor and destructor? Write a C++ program that   7
        demonstrates the use of these.

    b) Write about parameter passing methods in C++   7

2. a) Explain in detail about operator and function overloading by taking an example.   7

    b) Write about I/O streams in C++.   7

3. What is Queue? Write the ADT implementation of Queues using templates in C++.   14

4. a) What is a dictionary? Explain in detail the different ways of representations of   7
        dictionaries?

    b) Define collision? Explain any two techniques that are used to resolve collision   7
        with suitable examples?

5. a) What is a priority queue? How do you implement priority queues using   Heaps?   7

    b) What are the different ways of performing external sorting on tapes?   7

6. a) What is an AVL search tree? How do we define the height of it? Explain about the   7
        balance factor associated with a node of an AVL tree.

    b) Explain how an AVL tree can be used to sort a sequence of n elements in O (n log   7
        time.

7. a) What is Splay tree? Explain the process of splaying by taking an example   7

    b) Write a routine to perform insertion into a B-tree   7

8. a) What is Pattern matching? Explain in detail Brute force algorithm by taking an   7
        example?

    b) Differentiate between Standard and Compressed Tries.   7

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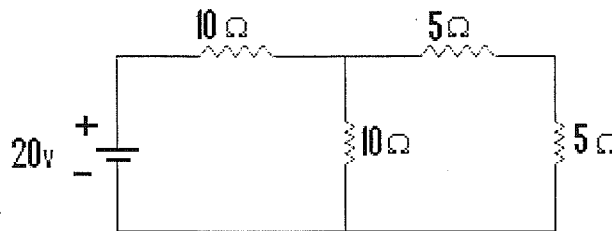### Basic Electrical Engineering
(Common to CSE & IT)

Time: 3 hours   Max Marks: 70

Answer any FIVE of the following
All questions carry equal marks (14 Marks each)

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1. a) Derive the equation for equivalent resistance when connected in i) series ii) parallel.

   b) Find the current, I in the following ckt

2. a) Give the statement of Thevenins Theorem and explain by taking a network

   b) By using Thevenins theorem find the current through 5Ω resistor.
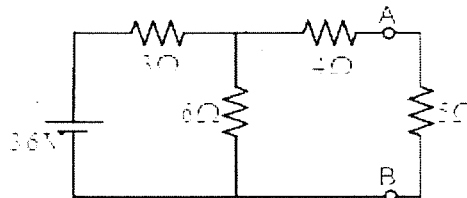
3. a) Derive expression for r.m.s. and average value of a sinusoidal alternating quantity

   b) A two element series circuit is connected across an A.C. source given by $V = 200\sqrt{2}$ sin (314 t + 20). The current in the circuit is found to be $i = 10\sqrt{2}$ cos(314 t – 25). Determine the parameters of the circuit. Also determine the power factor, real power and reactive power taken by the circuit.

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

   b) Three impedances each of (3-j4) ohms is connected its delta to a 230V, 3-phase, and 50Hz balanced supply. Calculate the line and phase currents in delta connected load and the power delivered to the load.

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

   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 Weber 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 Weber ?

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

   b) The iron and full load copper loss in a 40KVA 1 phase transformer are 450 W and 850 W respectively. Find
   (a) Efficiency at full load when the power factor of the load is 0.8 lagging
   (b) The maximum efficiency and
   (c) The load at which the maximum efficiency occurs.

7. a) Explain the types of rotors in three phase induction motor with suitable diagram

   b) A three-phase, 50Hz, 4-pole induction motor has a slip of 4%. Calculate:
   (i). Speed of the motor.
   (ii). Frequency of the rotor emf.

8. a) What are the basic requirements of indicating instrument? Briefly discuss them.

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

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ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES :: RAJAMPET
(AUTONOMOUS)
II B.Tech I Semester Supplementary Examinations June/July 2014
Environmental Science
(Common to ECE & IT)

Time: 3 hours   **Max Marks: 70**

Answer any FIVE of the following
All questions carry equal marks (14 Marks each)

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1. a) Define the term Environment, Ecology and Environmental Studies.   7M

    b) Write about the impacts of Industrialization on human Environment.   7M

2. a) Explain the applications of Solar Energy.   7M

    b) Give a brief account of Hydrological Cycle.   7M

3. a) Explain the Environmental effects of over exploitation of mineral resources.   7M

    b) Write a short note on   7M

        (i) Biological Magnification

        (ii) Dissolve Oxygen Demand.

4. a) Give an account of sources, effects and control measures of marine pollution.   7M

    b) Explain the effects of Oil Pollution.   7M

5. a) Give the characteristic features of Grass Land Eco System.   8M

    b) Write a short note on Ecological Pyramids.   6M

6. a) Write about common plant and animal species of India.   6M

    b) Give an account Endemic and Endangered Species with examples.   8M

7. a) Write about Water Shed Management. Give the success story of any Water Shed 8M
        Management in the country.

    b) Explain the effects of Dams on Environment and People.   6M

8. a) Discuss the role of IT in the protection of Environment and human health.   7M

    b) Explain the family welfare programs.   7M

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ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES :: RAJAMPET
(AUTONOMOUS)
II B.Tech I Semester Supplementary Examinations June/July 2014
Electronic Devices and Circuits
(Common to CSE & IT)

Time: 3 hours　　　　　　　　　　　　　　　　　　　　　　　**Max Marks: 70**

Answer any FIVE of the following
All questions carry equal marks (14 Marks each)

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1. a) Explain the drift and diffusion currents for a semiconductor.　　5M

   b) Distinguish between avalanche and zener mechanisms.　　4M

   c) Ex plain the V-I characteristics of a photo diode.　　5M

2. a) Explain the operation of bridge rectifier and derive the expression for V_{dc}, I_{dc}, ripple factor, peak inverse voltage, transformer utilization factor, form factor and peak factor.　　8M

   b) Calculate the value of capacitance to use in a capacitor filter connected to a full wave rectifier operating at a standard aircraft power frequency of 400 Hz, if the ripple factor is 10% for a load of 500 .　　6M

3. a) With neat circuit and input and output characteristics explain bipolar junction transistor in CE configuration.　　8M

   b) Explain the criteria for fixing the operating point.　　6M

4. A germanium transistor having = 100 and V_{BE} = 0.2 V is used in a fixed bias amplifier circuit when V_{CC} = 10 V, R_C = 5 k , and R_B = 790 k (R_B is between V_{CC} and base). Determine its operating point.　　14M

5. a) Write about broad classification of FET.　　4M

   b) Draw the structure of an n-channel JFET and explain its principle of operation. Why is the name field effect used for the device? Show the circuit symbol.　　10M

6. Derive the expression for the voltage gain, current gain, input impedance and output impedance of a CE amplifier using exact and approximate model.　　14M

7. Draw the practical circuit for voltage series feedback and find the voltage gain, input impedance and output impedance.　　14M

8. a) Derive an expression for frequency of oscillation of Hartley oscillator using transistor.　　4M

   b) A Wien bridge oscillator has a frequency of 500 Hz, if the value of C is 100 PF, determine the value of R.　　10M

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ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES :: RAJAMPET
(AUTONOMOUS)

II B.Tech I Semester Supplementary Examinations June/July 2014

Mathematical Foundations of Computer Science

(Common to CSE & IT)

Time: 3 hours   **Max Marks: 70**

Answer any FIVE Questions from the following
All questions carry equal marks (14 Marks each)

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1. a) Define Normal form and Explain various types of Normal forms.   4M

   b) Obtain any one of the normal form for the following formula.   10M

   $P \vee (\neg P \rightarrow (Q \vee (\neg Q \rightarrow R)))$

2. a) Define Predicate logic & Explain with example.   4M

   b) Define and explain Automatic Theorem of proving with example.   10M

3. a) Explain the properties of relations with Example.   10M

   b) Define Equivalence Relation with example.   4M

4. a) Define and give examples for semi groups and monaids.   7M

   b) Define homomorphism and Explain the properties of Homomorphism.   7M

5. a) Find the number of different ways in which 4 boys and 6 girls may be arranged in a row that no 2 boys shall be together.   8M

   b) Explain pigeonhole principles with example.   6M

6.   Solve the recurrence relations   14M

   $a_n - 9a_{n-1} + 26\, a_{n-2} = 0 \; for \; n \geq 2, given \; that \; a_0 = -3 \; and \; a_1 = -10$

7. a) Define Spanning Tree with example.   4M

   b) Find Spanning tree for the graph shown below fig with vertex ordering **abcdefg** by using BFS Method.   10M
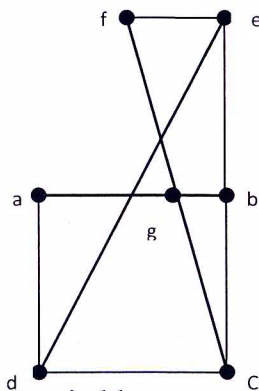
8. a) Define the following terms with suitable examples.   8M

        i. Euler Path

        ii. Euler Circuit

        iii. Multi Graph

        iv. Hamiltonian cycle.

   b) Find the number of edges in a graph contains 2 vertex of degree 3 ,3 vertex of degree 4 and a vertex of degree 6.   6M

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