Code : 1GC34

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES :: RAJAMPET
(AUTONOMOUS)
II B.Tech. I Semester Regular Examinations, January 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) Explain the importance of Environmental Education.   7M

    b) Explain the scope of Environmental Engineering.   7M

2. a) Discuss the importance of Alternate Energy Resource.   7M

    b) Discuss the effects of modern agriculture on food resources of the world.   7M

3. a) Briefly discuss the types of soil erosion.   7M

    b) Explain the land conservation Measures.   7M

4. a) Define the term Solid Waste Management and explain various methods of Municipal
       Solid Waste Management.   14M

5. a) Explain the Nitrogen cycle with diagram.   7M

    b) Write a Short note on
        (i) Energy Flow
        (ii) Food Chain.   7M

6. a) Define the term Hot Spot, Give an account of Hot Spots of India.   7M

    b) Discuss the Conservation Measures of Bio-Diversity.   7M

7. a) Write a short note on Waste Land reclamation.   6M

    b) Write about the effects and control measures of Ozone Layer depletion.   8M

8. a) Explain the steps that are being taken India to impact value education from school
       days.   8M

    b) What are the modes of transmission of HIV and how it can be prevented?   6M

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Code : 1G133

R11

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES :: RAJAMPET
(AUTONOMOUS)
II B.Tech. I Semester Regular Examinations, January 2014
Mathematical Foundations of Computer Science
(CSE & IT)

Time: 3 hours

Max Marks: 70

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

* * * * *

1. a) Define Statement and Explain various Connectives with Example.   10M

   b) Define Tautology with Example.   4M

2. Show that S V R is tautology implied by using Rules of inference.

   $(P \lor Q) \land (P \rightarrow R) \land (Q \rightarrow S)$ 14M

3. a) Define Relation and Explain the Representation of a relation.   7M

   b) Let x= { 2,3,6,12,24,36} and the relation $\leq$ be such that $x \leq y$ if x divides y. Draw the Hash diagram.   7M

4. a) Show that the Composition of 2 Congruence relation on a set is not necessarily a Congruence Relation.   10M

   b) Define Group and Explain with Axioms.   4M

5. a) In How many ways can 5 similar books be placed in 3 different racks?   6M

   b) Explain the Principles of inclusion & exclusion principles.   8M

6. a) Define Recurrence relation & explain with example.   4M

   b) Solve the following recurrence relation by substation Method.
   $a_n = a_{n-1} + 1 / n(n+1)$, where $a_0 = 1$ 10M

7. a) Define Graph and explain various Representation of a graph with example.   8M

   b) Define Planer graph with Example.   6M

8. a) Define isomorphism with example.   7M

   b) Define Hamiltonian Graph with example.   7M

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R-11

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES :: RAJAMPET
(AUTONOMOUS)
II B.Tech. I Semester Regular Examinations, January 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) Define a class and a class member? Explain static class members with the help of an example.

   b) Write about parameter passing methods in C++

2. a) What is inheritance? Explain the different types of inheritance with the help of an example

   b) What are the differences between an abstract class and a class?

3. What is stack? Write the ADT implementation of stacks using templates in C++.

4. a) Explain the different methods that are used to calculate hash functions?

   b) How do you resolve collision using rehashing and extendible hashing?

5. a) What is external sorting? How do you perform external sorting on tapes using polyphase merge?

   b) What are the applications of priority queues?

6. What is an AVL tree? How do you perform insertion operation in an AVL tree using single and double rotations? Explain with the help of an example?

7. a) Explain the process of insertion in Red - Black trees?

   b) Define a B-Tree of order 'm'? How do you perform searching operation in a B-Tree.

8. a) What is pattern matching? Explain in detail Boyer–Moore algorithm by taking an example?

   b) Differentiate between Standard and Compressed Tries.

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES :: RAJAMPET
(AUTONOMOUS)
II B.Tech. I Semester Regular Examinations, January 2014
Basic Electrical Engineering
(Common to CSE & IT)

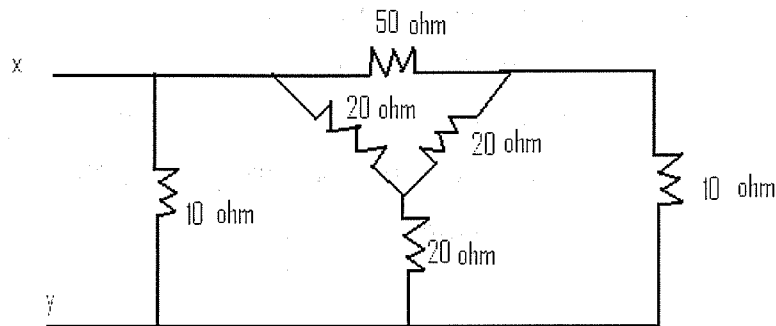Time: 3 hours   Max Marks: 70
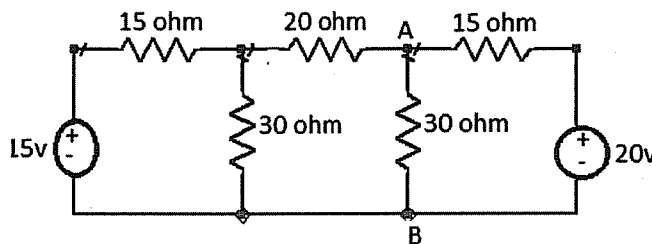
Answer any FIVE of the following
All questions carry equal marks (14 Marks each)

* * * * *

1. a) Define the following i) Resistance   (ii) Inductance   (iii) Capacitance.   Also give the V-I relationship for the above elements.

   b) Find the source current in figure below

2. a) State and explain Kirchhoff's laws using neat diagrams

   b) Determine the current in branch A-B by Kirchhoff's laws.

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

   b) A series circuit consisting of a 10Ω resistor, a $100~\mu F$ capacitor and a $10~mH$ inductor is driven by a 50 Hz A.C voltage source of maximum value 100 volts. Calculate the equivalent Impedance, current in the circuit, the power factor and power dissipated in the circuit.

4. a) What are the advantages of a poly phase system over a single phase system

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

5. a) Derive the expression for the armature torque and shaft torque of a DC motor.

   b) The armature of a 6 pole, DC shunt motor takes 300 A at the speed of 400 revolutions per minute. The flux per pole is 75 mWb. The number of armature turns is 500. The torque lost in windage, friction and iron losses can be assumed a 2.5% calculate

         i. Torque developed by the armature

        ii. Shaft torque

       iii. Shaft power in KW.

6. a) Explain the constructional details and types of single-phase transformers.

   b) A single-phase, 50 Hz transformer has 100 turns on the primary and 400 turns on the secondary winding. The net cross-sectional area of core is 250 cm^2. If the primary Winding is connected to a 230 V, 50 Hz supply. Determine,

       (i). The emf induced in the secondary winding

       (ii). The maximum value of flux density in the core.

7. a) Explain the principle and operation of a three-phase induction motor

   b) Explain the differences between squirrel cage induction motor and slip ring induction motor.

8. a) Explain

       (a) Deflecting torque

       (b) Controlling torque

       (c) Damping torque

   b) Explain with neat sketch the principle of operator of moving iron Instruments

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ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES :: RAJAMPET
(AUTONOMOUS)
II B.Tech. I Semester Regular Examinations, January 2014
Digital Logic Design and Computer Organization
(IT)

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

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

* * * * *

1. a) Discuss different types of Computers.   7M

   b) Convert the hex decimal number F3A7C1 to Binary and Octal Number System.   7M

2. a) Simplify the following Boolean function using three variable maps.

   $F(x,y,z)= \sum(0,1,5,7)$ 7M

   b) Simplify the following expression using Boolean Algebra.

   $AB + A (CD + CD^1)$ 7M

3. a) Explain Multiplexers in detail.   7M

   b) Write short notes on Shift Registers.   7M

4. a) Devise an algorithm for floating point addition representation.   7M

   b) Design Full-adder circuit using Half-adders.   7M

5. a) Explain RISC Characteristics.   7M

   b) Explain Indexed Addressing Mode with an example.   7M

6. a) Explain Instruction Cycle in detail.   7M

   b) Discuss Micro Programmed Control Organization.   7M

7. a) Explain Memory hierarchy in a computer system.   7M

   b) Discuss Associative Mapping with an example.   7M

8. a) Discuss any two peripheral devices that produce an acceptable output for a person

   to understand.   7M

   b) Write short notes on DMA Controller.   7M

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ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES :: RAJAMPET
(AUTONOMOUS)
II B.Tech. I Semester Regular Examinations, January 2014
Electronic Devices and Circuits
(CSE & IT)

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

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

* * * * *

1. a) Draw the energy band diagram of a PN junction under open circuit conditions and explain.   10M

   b) Explain the temperature dependence of V – I characteristics of a PN diode.   4M

2. a) Explain full wave centre tapped rectifier with capacitor filter with neat waveforms.   7M

   b) A full wave diode rectifier has v_i = 100sinωt, R_L = 900 Ω and R_f = 100 Ω. Calculate (a) the peak load current I_m, (b) the dc load current I_{dc} (c) ac load current I_{rms} (d) dc load voltage V_{dc} (e) the peak inverse voltage on the diode (f) ac input power (g) the dc output power (h) rectification efficiency.   7M

3. a) Draw the circuit of BJT in CC configuration and explain with input and output characteristics.   7M

   b) Distinguish between ac and dc load lines with suitable diagrams.   7M

4. a) List out the different types of biasing methods.   7M

   b) Derive the expression for stability factor for self-bias bipolar junction transistor.   7M

5. a) Why FET is called voltage controlled device?   4M

   b) With a neat sketch explain the drain source characteristics and transfer characteristics of enhancement type MOSFET.   10M

6. a) Compare A_V, A_I, R_i and R_o of CE, CB and CC configurations.   4M

   b) The h-parameters of a transistor used in CE circuit are h_{ie} = 1.0 kΩ, h_{re} = 10x 10^{-4}, h_{fe} = 50, h_{oe} = 100k. The load resistance for the transistor is I kΩ in the collector circuit. Determine R_i, R_o, A_V, and A_I in the amplifier stage (Assume R_s=100Ω).   10M

7. Explain the current shunt feedback, also find the gain, input impedance and output impedance.   14M

8. a) Explain the Barkhausen conditions required for sinusoidal oscillations to be sustained.   4M

   b) A Colpitts oscillator is designed with C_1= 100 PF and C_2 7500 PF. The inductance is variable. Find the range of inductance value, if the frequency of oscillation is to vary between 950 KHz and 2050KHz.   10M

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