R-11

Code : 1G131

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES :: RAJAMPET

(AUTONOMOUS)

II B.Tech I Semester Supplementary Examinations April/May – 2013

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 the basic principles of object oriented programming.	6
	b.	Define Constructor. Explain the concept of multiple Constructors with example.	8
2.	a.	Discuss overloading of binary operators using friend functions.	8
	b.	Distinguish between function overloading and operator overloading.	6
3.	a.	Briefly explain how to analyze an algorithm.	7
	b.	Write a program to implement Queue ADT using template classes in C++.	7
4.	a.	What are the features of hashing? Explain.	6
	b.	Discuss linear probing collision resolution technique with example.	8
5.	a.	How can you reconstruct the heap? Explain with an example.	7
	b.	Explain polyphase merge sort with an example.	7
6.	a.	What is a threaded binary tree? Explain with an example how the threads are mapped.	7
	b.	Discuss deletion operation on Binary Search trees with example.	7
7.	a.	Discuss various possible rotations on splay trees with examples.	7
	b.	Give the application of B-Trees and mention the advantages and disadvantages of it.	7
8.	a.	Differentiate between Tries and hash tables.	4
	b.	Write and explain Boyer-Moore pattern matching algorithm.	10

Code : 1G431

R-11

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES :: RAJAMPET

(AUTONOMOUS)

II B.Tech I Semester Supplementary Examinations April/May – 2013

Digital Logic Design and Computer Organization

(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. Give the differences between fixed point representation and floating point representation. **7M**

   b. Convert the following numbers from given base to the base indicated. **7M**

   - Hexadecimal 2AC5.D to decimal, octal and binary
   - Binary 11010111.110 to decimal, octal and hexadecimal

2. a. What is the difference between canonical form and standard form? Which form is preferable when implementing a Boolean function with gates? Why? **7M**

   b. Express the following functions in a sum of min-terms and product of max-terms. **7M**

   $F(x,y,z)=(xy + z)(y + xz)$

3. a. Distinguish between combinational circuits and sequential circuits with neat diagrams and examples. **7M**

   b. Implement a full adder circuit with multiplexers. **7M**

4. a. Write an algorithm to add binary numbers represented in normalized floating point mode with base 2 for exponent. **14M**

5. a. What is the difference between immediate, direct and indirect instructions? How references to memory are needed for each type of instruction to bring an operand into processor register. **7M**

   b. Consider the statement X = (A + B) * (C + D). Represent it in **7M**

   - three address instruction
   - zero address instruction

6. a. Distinguish between hard wired control and micro processor control. **7M**

   b. Give the general configuration of micro programmed control organization. **7M**

7. a. How many 128 x 8 RAM chips are needed to provide a memory capacity of 2048 bytes? **7M**

   b. Explain the mechanism of data transfer between main memory and secondary memory with examples. **7M**

8. a. What is DMA data transfer? Describe DMA data transfer mechanism between a CPU and peripheral device giving details of various steps provided in such data transfer. **7M**

   b. Explain the types of commands an I/O device receives when addressed by the CPU. **7M**

Code : 1G334

R-11

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES :: RAJAMPET

(AUTONOMOUS)

II B.Tech I-Semester Supplementary Examinations Apr/May 2013.

Electronic Devices and Circuits

(*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 the working of a PN junction forward bias and in reverse bias	7
	b)	The transition capacitance of an abrupt junction diode is 20pF, at 5V. Compute the value of decrease in capacitance for a 1.0 volt increase in the bias.	7
2.	a)	Explain Full wave rectifier operation and derive all the necessary parameters of FWR.	7
	b)	A FWR is used to supply power to a 2000 load. Choke inductors of 20 H inductance and capacitors of 16 μ f are available. Compute the ripple factor using 1) One Inductor filter 2) one capacitor filter	7
3.	a)	Draw and explain input and output characteristics of common emitter configuration of a transistor	7
	b)	Calculate I_C and I_E for a transistor with $\alpha_{d.c}$=0.99 and I_{CB0}=5 μ A,I_B=20 μ A.	7
4.	a)	Explain about the need for biasing in electronic circuits, what are the factors affecting the stability factor.	7
	b)	Explain the terms 1) Thermal Runaway 2) Thermal Resistance	7
5.	a)	Give a detailed description of construction and operation of JFET	7
	b)	Compare BJT, JFET and MOSFET devices in all respects.	7
6.		Determine A_v, A_i, R_i, R_o for a single stage CE amplifier using NPN Transistor with h_{ie}=1200Ω, h_{re}=0, h_{fe}=36, h_{oe}=2x10 $^{-6}$ Ω, R_L= 2.5 KΩ, R_s=500 Ω (Neglect the effect of biasing circuit).	14
7.	a)	Explain in detail about general characteristics of negative feedback amplifiers,	7
	b)	An amplifier has voltage gain with feedback of 100. If the gain without feedback changes by 20% and the gain with feedback should not vary more than 2%, determine the values of open loop gain and feedback ratio β.	7
8.	a)	Explain the principle of operation of crystal oscillator and give its applications	7
	b)	In the Hartley oscillator, L_2=0.4mH and C=0.004 μF. If the frequency of the oscillator is 120kHz, find the value of L_1. Neglect the mutual inductance.	7

Code : 1GC34

R-11

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES :: RAJAMPET
(AUTONOMOUS)
II B.Tech I Semester Supplementary Examinations April/May – 2013
Environmental Science
(Common *to ECE & IT)*

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

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

1.		Explain the need for public awareness on environmental issues.	14M
2.	a)	Discuss various types of natural resources and their associated problems.	10M
	b)	What are the consequences of overdrawing of ground water.	04M
3.	a)	Discuss the environmental effects due to mineral extraction and usage.	07M
	b)	Write a short note on land resources.	07M
4.	a)	Discuss the ecological and economic impacts of soil pollution.	08M
	b)	Explain the causes and effects of floods.	06M
5.		Explain briefly about the structure, characteristic features and functions of desert ecosystem.	14M
6.	a)	Discuss about biodiversity at global, national and local levels.	10M
	b)	Write a short note on in-situ conservation.	04M
7.	a)	Discuss equitable use of resources for sustainable lifestyle.	07M
	b)	Explain the causes and effects of acid rain.	07M
8.	a)	Discuss the need and objectives of women and child welfare.	10M
	b)	Write a short on population growth.	04M

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Code : 1G133 **R-11**

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES :: RAJAMPET

(AUTONOMOUS)

II B.Tech I Semester Supplementary Examinations April/May – 2013

Mathematical Foundations of Computer Science

(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) Construct the truth table of the following formula

$\neg(P \vee (Q \wedge R)) \vec{\leftarrow} ((P \vee Q) \wedge (P \vee R))$ **6M**

b) Obtain disjunctive normal forms (DNF) of

$\neg(P \vee Q) \vec{\leftarrow} (P \wedge Q)$ **8M**

2 a) Using Indirect method of proof derive $P \rightarrow \neg S$ from $P \rightarrow (Q \vee R), Q \rightarrow \neg P, S \rightarrow \neg R, P$ **8M**

b) State and Explain Automatic Theorem proving **6M**

3 a) Define the following terms and give an example for each
i) Reflexive ii) Irreflexive iii) Anti-symmetric iv) Transitive **8M**

b) Show that the function

$f(x) = \begin{cases} x/2 & when\ x\ is\ even \\ (x-1)/2 & when\ x\ is\ add \end{cases}$ is primitive recursive **6M**

4 a) Let R be the set of real numbers in [0,1] and $\leq$ be the usual operation of "less than or equal to " on R. Show that $<R, \leq>$ is a lattice. What are the operation of meet and join on this lattice? **8M**

b) Show that the lattices given by the diagrams in Figure 4 are not distributive.

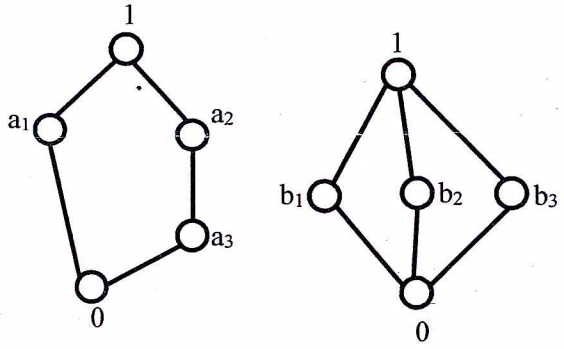

Figure 4 **6M**

5 a) Using the binomial theorem to prove that $3^n = \sum_{r=0}^{n} c(n,r)2^r$ **6M**

b) i. State and explain generalised theorem of principles of inclusion -exclusion.
ii. How many anagrams (arrangements of letters) are there of {7.a, 5.c, 1.d, 5.e, 1.g, 1.h, 7.i, 3.m, 9.n, 4.o, 5.t}? **8M**

6 a) Solve the recurrence relation $a_r = 3\,a_{r-1} + 2$, $r \geq 1$, $a_0 = 1$ using generating function. **7M**

b) Solve $a_n + 5a_{n-1} + 6a_{n-2} = 3n^2 - 2n + 1$ using characteristics roots. **7M**

7 a) Explain BFS with an example **6M**

b) Use Kruskal's algorithm to find the minimum spanning tree for the following graph (**Figure 7**).

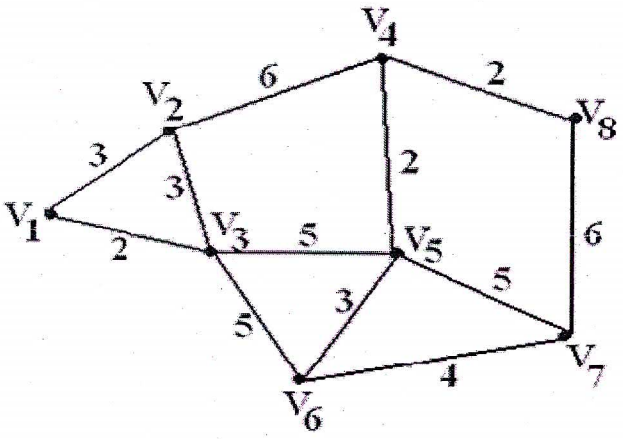

Figure 7 **8M**

8 a) State the necessary and sufficient conditions for the existence of Hamiltonian circuit in $K_{m,\,n}$. **7M**

b) Find the chromatic number of following (**figure 8**) graph.

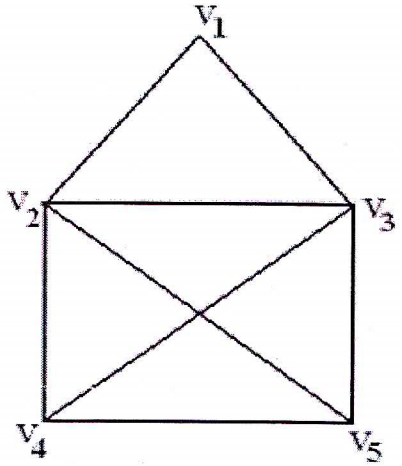

figure 8 **7M**