



Reg. No. :

Name :

**IV Semester B.Tech. (Reg./Sup./Imp. – including Part Time)
Degree Examination, June 2011
(2007 Admn.)
2K6 CS/IT 402 : DATA STRUCTURES AND ALGORITHMS**

Time: 3 Hours

Max. Marks: 100

- I. a) Define space and time complexity of a program.
- b) Explain structure data type with example.
- c) What are the advantages of circular linked list over a linear list ?
- d) Distinguish between Ordinary Queue and Circular Queue.
- e) Write a short note on heap management.
- f) Write a note on priority queue.
- g) Discuss different hashing functions.
- h) Sort 10, 15, 6, 5, 8, 12 in ascending order using the Bubble Sort algorithm. (8×5=40)

II. 1) a) Find the Big-oh notation for the following :

- i) $8n + 4n^3 + 8n^4$
- ii) $n^2 + n \log n$
- iii) $\sqrt{n} + 3 \log n$. 7

b) What do you mean by scalar data types ? Explain any 2 datatypes in detail. 8

OR

2) Give the general plan for analysing the recursive algorithms. Mathematically analyse the factorial problem, clearly indicate the steps and comment on its complexity. 15

III. 1) a) Write algorithms for performing the following :

- i) To find the sum of all the elements in a singly linked list.
- ii) To append a new element to the end of the linked list. 10

b) What is a stack ? Explain the basic operations. 5

OR

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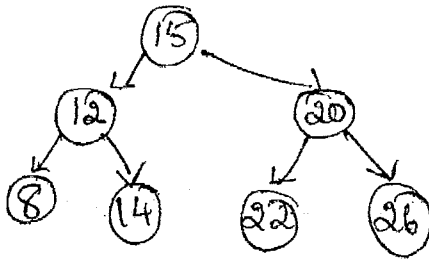


- 2) a) Explain with diagrams, how nodes can be added and deleted from the middle of the linked list. 5
- b) Write an algorithm to convert an infix string into a postfix string. Trace your algorithm on the following string : 10
 $a + b * c + d.$

- IV. 1) a) Write Kruskal's algorithm. What are its applications ? How is it different from Prim's algorithm ? 7
- b) With suitable example, explain Breadth First Search algorithm. 8

OR

- 2) a) Explain any 3 methods of representation of graph. 9
- b) Write the results after traversing the tree in in-order, preorder and post order. 6



- V. 1) a) What is a heap ? Write an algorithm to sort an array of integers using the heap sort method. Given 30, 61, 52, 42, 15, 90, 88, 37 are the elements on the array. Show the different stages of sorting. 15

OR

- 2) a) What is hashing ? Explain the methods for resolving hash collision. 10
- b) What are the different methods of searching ? Discuss their merits and demerits. 5
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2K6 CS/IT 403 – SYSTEMS PROGRAMMING**

Time : 3 Hours

Max. Marks : 100

Instruction : Answer all questions.

- I. a) Name the various registers in the SIC machine.
 - b) Mention the various data structures used in the assembler design.
 - c) Explain the absolute loader algorithm.
 - d) Briefly explain linkage editor.
 - e) Mention the data structures used in macro processor algorithm.
 - f) Briefly explain the keyword macro parameters.
 - g) Mention the basic compiler functions.
 - h) Define time Sharing Systems and Real Time Systems. (8×5=40)
- II. a) Explain the various instruction formats of SIC/XE machine along with various addressing modes. 8
 - b) Bring out the differences between RISC and CISC machines. 7

OR

- a) Explain the memory, registers, data formats and addressing modes of VAX machine. 8
- b) Explain the Pass 1 of a 2-Pass assembler algorithm. Explain the use of symbol table. 7

P.T.O.



- III. a) Explain the Linking Loader algorithm along with the data structures used. 8
 - b) Explain Dynamic Linking. 7
 - OR
 - a) Explain the automatic library search feature. 8
 - b) Explain the features of MS-DOS linker. 7
 - IV. a) Explain the algorithm for a one-pass micro processor along with the data structures used. 15
 - OR
 - a) Explain the conditional macro expansion. 8
 - b) Explain the MASM macro processor features. 7
 - V. a) Explain the different phases of compiler. 8
 - b) Explain the I/O structure of the computer system. 7
 - OR
 - a) Explain the storage hierarchy in operating system. 8
 - b) Briefly explain about the UNIX operating system. 7
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M 19289

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2K6 CS/IT 404 : MICROPROCESSORS AND MICROCONTROLLERS

Time: 3 Hours

Max. Marks: 100

I. 1) Explain the function of following pin signals w.r.t. 8086. (8×5=40)

i) $\overline{\text{BHE}}$

ii) ALE

iii) NMI

iv) INTR

v) READY.

2) Differentiate between Minimum mode and Maximum mode in 8086.

3) What is address decoding ? Explain why decode memory.

4) Explain the bit configuration of control word register for 8255 PPI.

5) Describe the memory system organization of 80386.

6) How we can switch from real mode to protected mode ?

7) Explain 80196 Microcontroller CPU operations.

8) Write a note on PWM timer.

II. A) i) Explain different types of addressing modes for 8086. 8

ii) Write a 8086 assembly language program to sort a byte array in ascending order using bubble sort. 7

OR

B) Describe the functional block diagram of 8086 with neat diagram. 15

P.T.O.



- III. A) i) Explain the internal block diagram of 8253 Programmable Interval Timer. 7
- ii) Explain any four modes of operations of 8253 with neat wave diagram. 8
- OR
- B) i) How 8259 interrupt controller can initialize ? 8
- ii) Describe the operation of DMA controller with neat diagram. 7
- IV. A) i) Describe the super architecture and the operation of branch prediction logic in Pentium Processor. 7
- ii) Explain with neat diagram, and timing diagram, how to determine memory access time. 8
- OR
- B) i) How the 80386 addresses a memory segment in the protected mode using a selector and a descriptor ? 8
- ii) Describe the memory system for Pentium processor. 7
- V. A) i) Differentiate between Microcontroller and Microprocessor. 8
- ii) Write a note on interrupts in Microcontroller. 7
- OR
- B) i) Explain IO in microcontroller. 7
- ii) Describe 80196 microcontroller special modes of operation. 8



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**IV Semester B.Tech. (Reg./Sup./Imp. – including Part Time)
Degree Examination, June 2011
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2K6 CS 405 : COMPUTER ORGANIZATION AND DESIGN**

Time: 3 Hours

Max. Marks: 100

Instruction : Answer all questions.

- I. a) Write notes on the following :
- System software,
 - Application software,
 - Operating system,
 - Compiler.
- b) Suppose you have two implementation of the same instruction set architecture. Computer A has a clock time of 250 Ps and a CPI of 2.0 for a program and computer B has a clock time of 500 Ps and CPI 1.2 for the same program. Which computer is the faster for the program and by how much ? Justify.
- c) Write notes on signed and unsigned numbers with examples.
- d) Write short notes on addition and subtraction happening in a computer system with suitable examples.
- e) With the help of a neat diagram explain the working of the portion of a data path which is used for fetching instructions and incrementing the program counter.
- f) Write notes on exception with an example.
- g) Write notes on the following :
- Temporal locality,
 - Spatial locality,
 - Memory hierarchy,
 - Hit rate and
 - Miss rate.

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M 19290

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2K6CS 406 : ELECTRIC CIRCUITS AND SYSTEMS

Time: 3 Hours

Max. Marks : 100

Instructions : i) Answer **all** questions.
ii) Missing datas may be suitably **assumed**.

1. a) Explain the mesh analysis of solving electrical network with suitable example. **5**
- b) State and explain Norton's Theorem. **5**
- c) Explain how to find the star equivalent of a delta connected impedances. **5**
- d) Draw the response of series R-L circuit when excited by a D.C. source. **5**
- e) With a neat diagram show the bridge balance equation of Maxwell's bridge. **5**
- f) What is h-parameters ? Draw the equivalent n/w in terms of h-parameters. **5**
- g) Explain the meaning of time domain and frequency domain. **5**
- h) What is signal flow graph (SFG) ? Draw the SFG of a cloud loop system. **5**
2. a) State and explain superposition theorem as applied to D.C. networks. **7**
- b) Explain the terms as applied to network topology.
 - i) Oriented graph
 - ii) Planar graph
 - iii) Tree
 - iv) Loop **8**

OR

P.T.O.



- c) Determine the currents through $10\ \Omega$ resistance of the network shown in Fig (i) Q. 2(c) using superposition theorem. 10

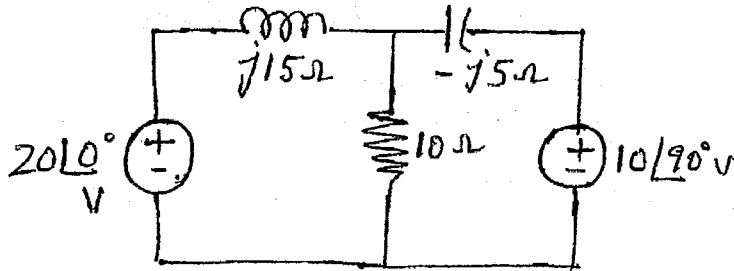


Fig. (i) Q.2 (c)

- d) The reduced incidence matrix of an oriented graph is

$$A = \begin{bmatrix} 0 & -1 & 1 & 0 & 0 \\ 0 & 0 & -1 & -1 & -1 \\ -1 & 0 & 0 & 0 & 1 \end{bmatrix} \text{ Draw the graph.}$$

5

3. a) Show that two Wattmeters are sufficient to measure total 3 ϕ power in a balanced star connected load. Draw the phasor diagram. 9
- b) Explain the effect of switching action on basic elements like R, L and C. 6

OR

- c) Find the Laplace transform of

i) $\sin \omega t$

ii) te^{-at} .

6

- d) A symmetrical 200 volt, 3-phase system supplies a star connected load with the branch impedances :

$$Z_R = 10 \angle 0^\circ \ \Omega$$

$$Z_Y = 10 \angle 60^\circ \ \Omega \quad Z_B = 10 \angle 60^\circ \ \Omega$$

Calculate the voltage drop across each branch and the potential of the neutral point to earth. The phase sequence is RYB. 9

4. a) Explain how the bridge balance is achieved in Anderson's bridge. Draw the related phasor diagram also. 15

OR



- b) What is a two-port network ? Explain Z- parameters and draw the equivalent network in terms of Z-parameters. 7
- c) What is condition for symmetry of N/W. Show the condition of symmetry for y-parameters. 8
- 5. a) Explain with blocks open loop and closed loop control system. List at least two examples. 7
- b) For the signal flow graph shown in Fig. (ii) Q. 5 (b) determine the transfer function $C(s)/R(s)$. 8

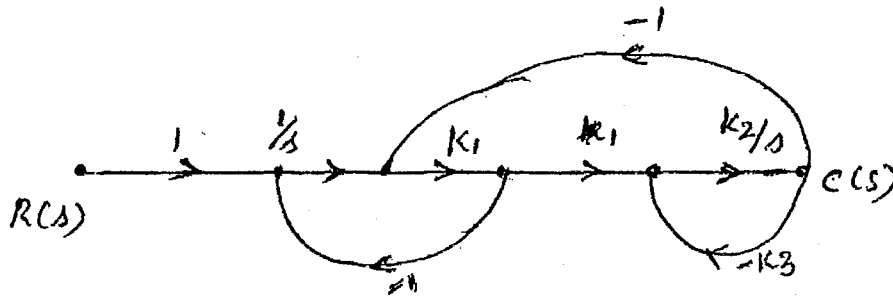


Fig. (ii) Q. 5 (b)

OR

- c) Explain what is Routh stability criterion. 7
- d) For the closed loop system of Fig. (iii) Q. 5 (d) find the controller gain for the system to be stable. 8

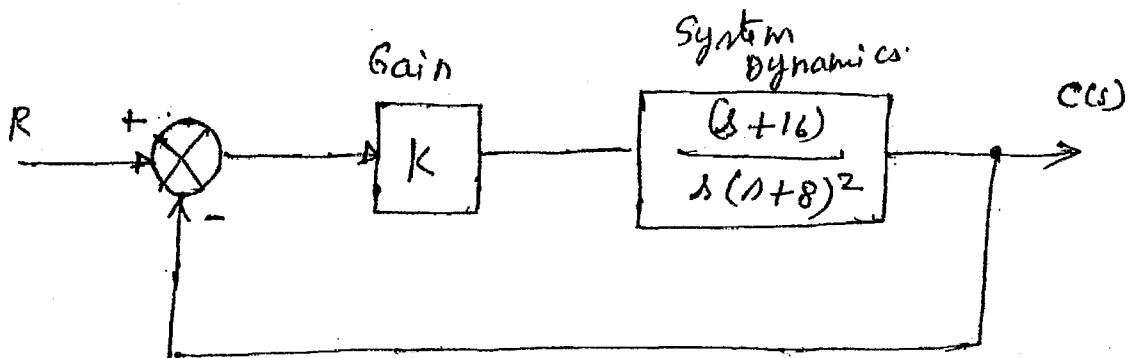


Fig. (iii) Q. 5 (d)