

DEC-2008**[3462]-175****S.E. (Comp.) (First Sem.) EXAMINATION, 2008****DISCRETE STRUCTURE****(Common to I.T.)****(2003 COURSE)****Time : Three Hours****Maximum Marks : 100**

N.B. :- (i) In Section I, attempt Q. No. 1 or Q. No. 2, Q. No. 3 or Q. No. 4, Q. No. 5 or Q. No. 6. In Section II, attempt Q. No. 7 or Q. No. 8, Q. No. 9 or Q. No. 10, Q. No. 11 or Q. No. 12.

(ii) Answers to the two Sections should be written in separate answer books.

(iii) Neat diagrams must be drawn wherever necessary.

(iv) Assume suitable data, if necessary.

SECTION I

1. (a) A survey has been taken on methods of computer travel. Each respondent was asked to check BUS, TRAIN or AUTOMOBILE as a major method of travelling to work. More than one answer was permitted. The results reported were as follows :
- BUS – 30 people, TRAIN – 35 people, Automobile – 100 people, BUS and TRAIN–15 people, BUS and AUTOMOBILE–15 people, TRAIN and AUTOMOBILE–20 people and all three methods– 5 people. How many people completed a survey form ? [4]

(b) State whether the argument given is valid or not : [4]

(i) If I drive to work; then I will arrive tired.

I do not drive to work

\therefore I will not arrive tired

(ii) I will become famous or I will not become a writer.

I will become a writer

\therefore I will become famous.

(c) Show the following using Venn diagram : [5]

(i) $A \cup (\bar{B} \cup C) = (A \cup \bar{B}) \cap (A \cup C)$

(ii) $(A - B) - C = A - (B \cup C)$.

(d) Define finite and infinite set with example. [3]

Or

2. (a) Prove that for any positive integer n , the number $n^5 - n$ is divisible by 5. [6]

(b) Obtain conjunctive normal form if each of the following : [6]

(i) $P \wedge (P \rightarrow Q)$

(ii) $\sim (P \vee Q) \leftrightarrow (P \wedge Q)$

(iii) $Q \vee (P \wedge \sim Q) \vee (\sim P \wedge \sim Q)$

(c) If $A = \{a, b, \{a, c\}, Q\}$, determine the following sets :

(i) $A - \{a, c\}$

(ii) $\{\{a, c\}\} - A$

(iii) $A - \{\{a, b\}\}$

(iv) $\{a, c\} - A$. [4]

3. (a) A die is tossed twice and the numbers showing on the top faces are recorded in sequence. Determine sample space for each of the given events :
- (i) At least one of the numbers is a 5
 - (ii) At least one of the numbers is an 8. [4]
- (b) In how many ways can 6 men and 6 women be seated in a row if :
- (i) any person may sit next to any other ?
 - (ii) men and women must occupy alternate seats ?
- (c) All picture cards are removed from a pack of 52 cards and then 4 cards are drawn. Find the probability that :
- (i) They belong to different suits
 - (ii) They belong to different suits and denominations. [4]
- (d) Consider all positive integer numbers with 3 different digits :
- (i) How many are greater than 700 ?
 - (ii) How many are even ?
 - (iii) How many are odd ?
 - (iv) How many numbers are divisible by 5 ? [4]

Or

4. (a) A man, a woman, a boy, a girl, a dog and a cat are walking down a long and winding road one after the other :
- (i) In how many ways can this happen ?

(ii) In how many ways can this happen if the dog comes first ?

(iii) In how many ways can this happen if the dog immediately follows the boy ?

(iv) In how many ways can this happen if only dog is in between the man and the boy. [6]

(b) Suppose that 3 balls are selected at random from an urn containing 7 red balls and 5 black balls. Compute the probability that :

(i) All three balls are red

(ii) At least two balls are black

(iii) At most two balls are black

(iv) At least one ball is red. [6]

(c) Suppose a fair die is tossed and the number showing on the top face is recorded. Let E, F, G be the following events :

$$E : \{1, 2, 3, 5\}$$

$$F : \{2, 4\}$$

$$G : \{1, 4, 6\}$$

Compute the probability of the event indicated :

(i) $\bar{E} \cap F$

(ii) $E \cup G$. [4]

5. (a) Determine whether the relation R whose diagram given is an equivalence relation : [6]

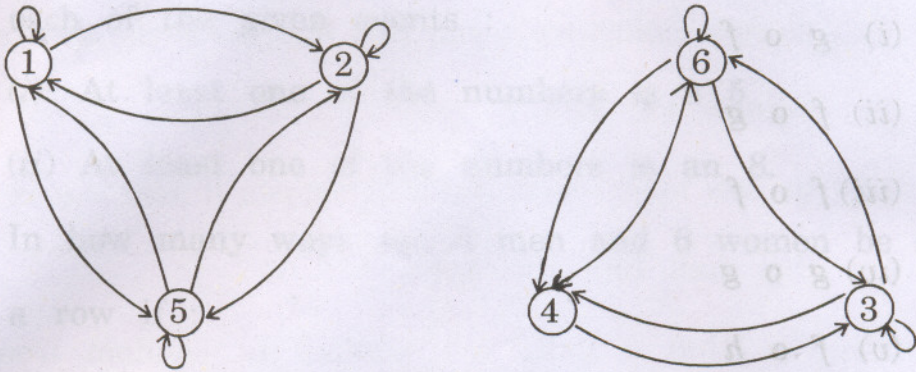


Fig. 1

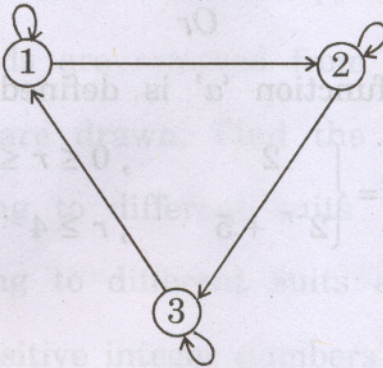


Fig. 2

- (b) Let $A = \{a_1, a_2, a_3, a_4, a_5\}$ and Let R be a relation on A whose matrix is :

$$M_R = \begin{bmatrix} 1 & 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 & 1 \\ 1 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 1 \end{bmatrix} = W_0$$

Compute W_1, W_2, W_3 as in Warshall's algorithm. [6]

(c) Let $f(x) = x + 2$, $g(x) = x - 2$ and $h(x) = 3x$ for $x \in \mathbb{R}$, where \mathbb{R} = set of real numbers. Find :

(i) $g \circ f$

(ii) $f \circ g$

(iii) $f \circ f$

(iv) $g \circ g$

(v) $f \circ h$

(vi) $h \circ g$.

[6]

Or

6. (a) The numeric function 'a' is defined as :

$$a_r = \begin{cases} 2 & , 0 \leq r \leq 3 \\ 2^{-r} + 5 & , r \geq 4 \end{cases}$$

Determine :

(i) $S^2 a$

(ii) $S^{-2} a$

(iii) Δa

(iv) ∇a .

[8]

(b) For $A = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$ consider the poset

(A, R) whose Hasse diagram is shown below. Find :

(i) GLB $\{2, 3\}$

(ii) GLB $\{2, 7\}$

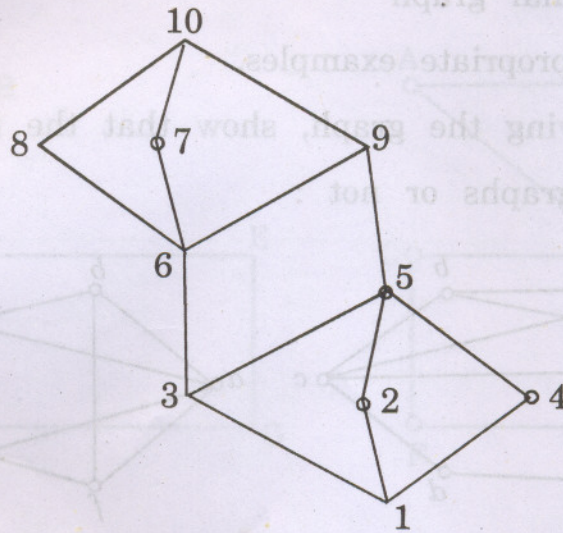
(iii) GLB $\{5, 8\}$

(iv) LUB {3, 2}

(v) LUB {4, 8}

(vi) LUB {3, 5}

[6]



(c) Define functions :

[4]

(i) One-to-one

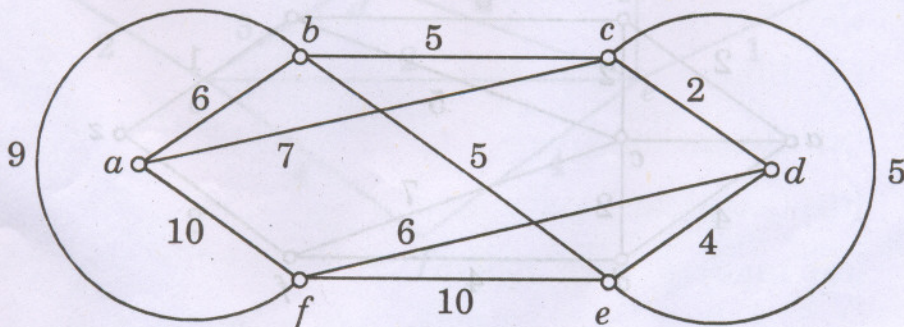
(ii) On-to

(iii) Invertible

(iv) One-to-one onto.

SECTION II

7. (a) Use nearest neighbour method to find Hamiltonian circuit starting from a . Find its weight. [6]



(b) Define :

(i) Isomorphic graphs

(ii) Complete graph

(iii) Regular graph

with appropriate examples.

[6]

(c) By drawing the graph, show that the following graphs are planar graphs or not :

[6]

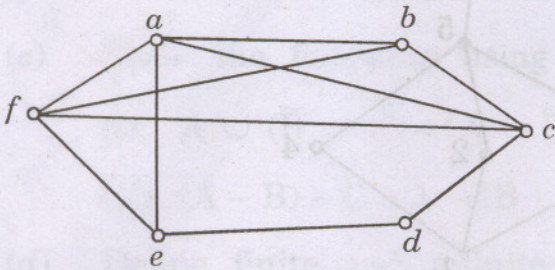


Fig. (i)

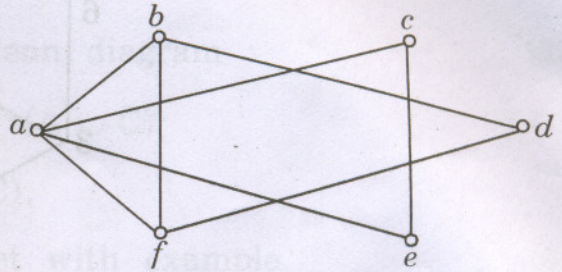


Fig. (ii)

Or

8. (a) Define :

(i) Eulerian graph

(ii) Hamiltonian graph

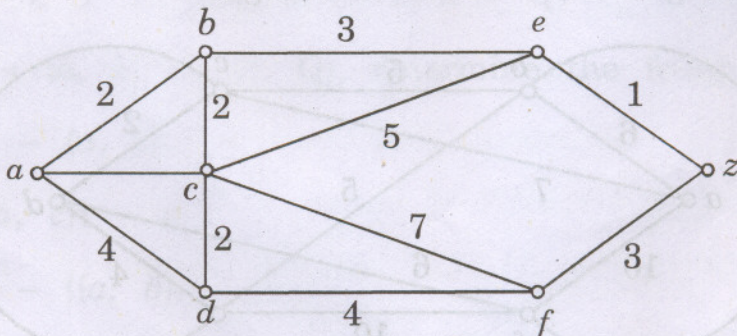
(iii) Planar graph

with examples.

[6]

(b) Apply shortest path algorithm and find shortest path between a to z in the graph given below :

[6]



- (c) Determine which of the given graphs represent Eulerian circuit, Eulerian path, Hamiltonian circuit, Hamiltonian path. Justify your answer. [6]

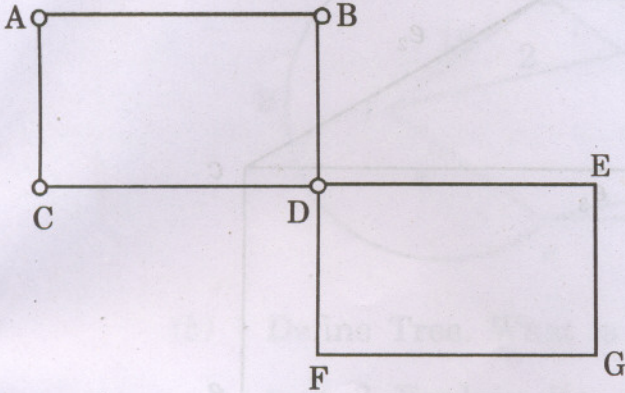


Fig. 1

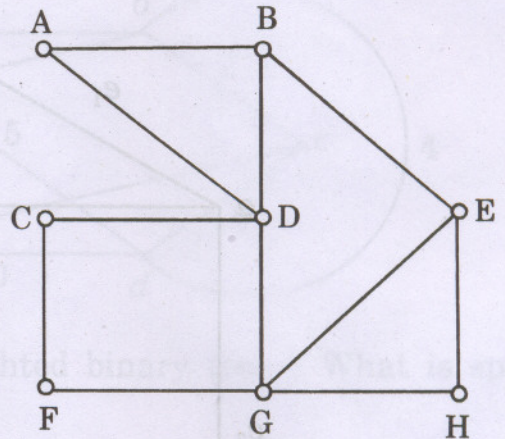
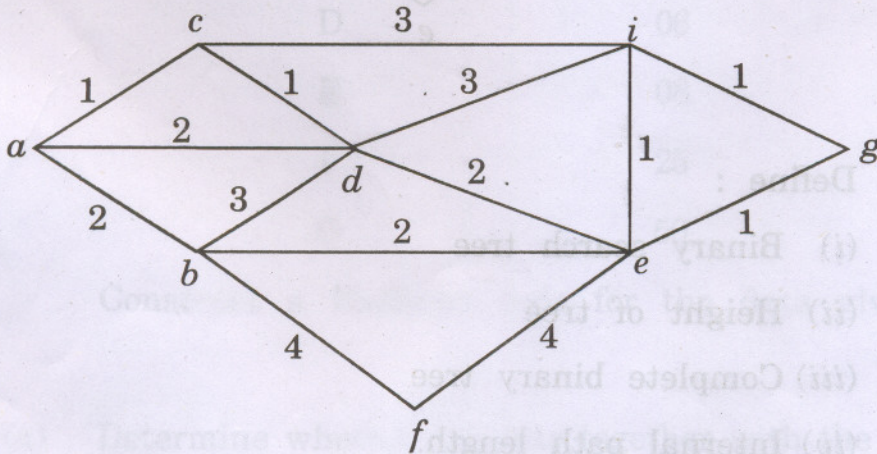
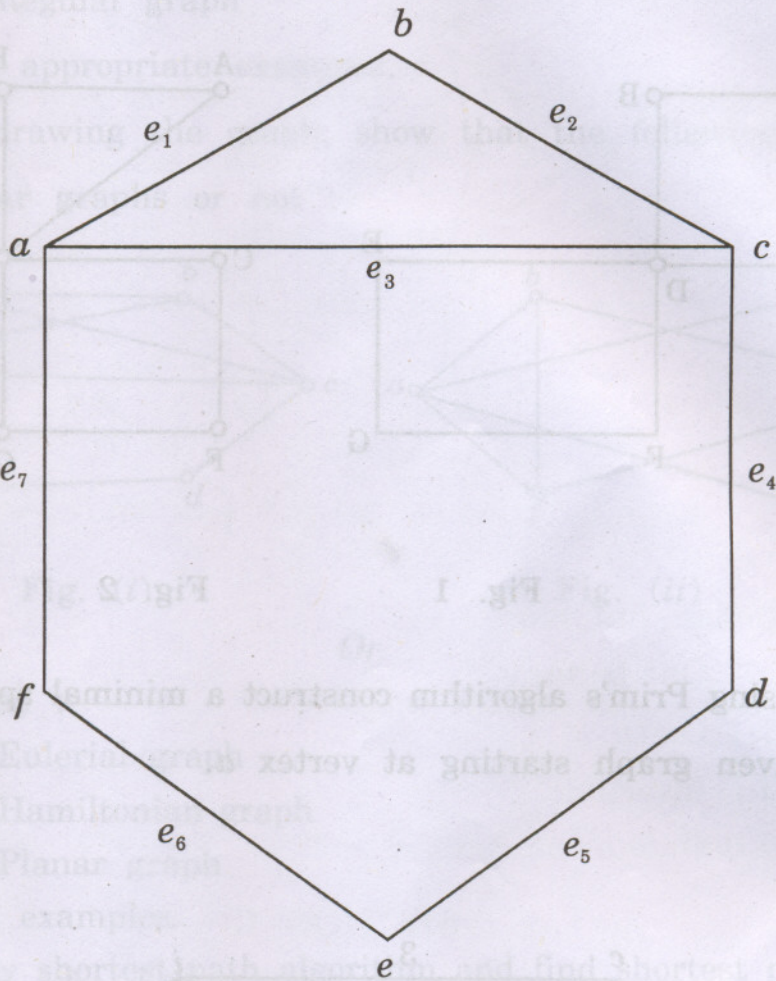


Fig. 2

9. (a) Using Prim's algorithm construct a minimal spanning tree for given graph starting at vertex a . [6]



- (b) Find all possible cut sets of graph G . Also find its fundamental system of cut sets for a spanning tree T . [6]



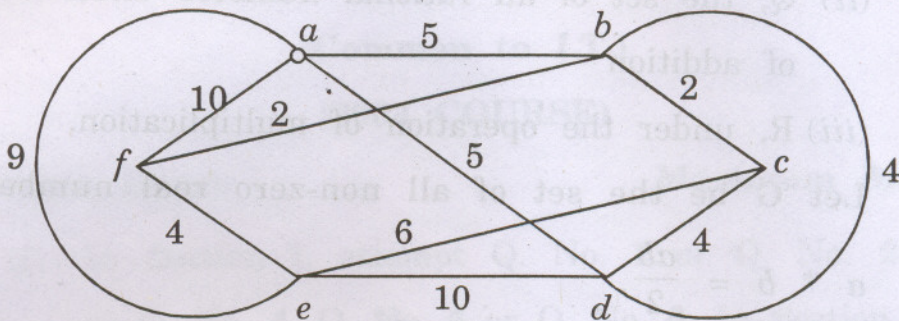
(c) Define :

- (i) Binary search tree
- (ii) Height of tree
- (iii) Complete binary tree
- (iv) Internal path length.

[4]

Or

10. (a) Using Kruskal's algorithm find minimal spanning tree for the given graph. [6]



- (b) Define Tree. What is weighted binary tree ? What is spanning tree ? Explain its use. [6]
- (c) Suppose data items A, B, C, D, E, F, G occur with the following probability distribution.

Data item	Probability
A	20
B	15
C	12
D	06
E	08
F	25
G	50

Construct a Huffman code for the data given. [4]

11. (a) Determine whether the sets together with the binary operation is a group in the following sets. If it is a group, determine

if it is Abelian; specify the identity and the inverse of a generic element. [6]

(i) \mathbb{Z} , where $*$ is ordinary multiplication

(ii) \mathbb{Q} , the set of all rational numbers under the operation of addition

(iii) \mathbb{R} , under the operation of multiplication.

(b) Let G be the set of all non-zero real numbers and let

$$a * b = \frac{ab}{2}.$$

Show that $(G, *)$ is an Abelian group. [6]

(c) Define :

(i) Group

(ii) Semigroup with example. [4]

Or

12. (a) Define :

(i) Ring homomorphism

(ii) Ring Isomorphism. [6]

(b) What is monoid ? Let $(A, +)$ be an algebraic system, where $+$ is binary operation on $A = \{0, 2, 4, 6, \dots\}$ show that $(A, +)$ is a monoid. [6]

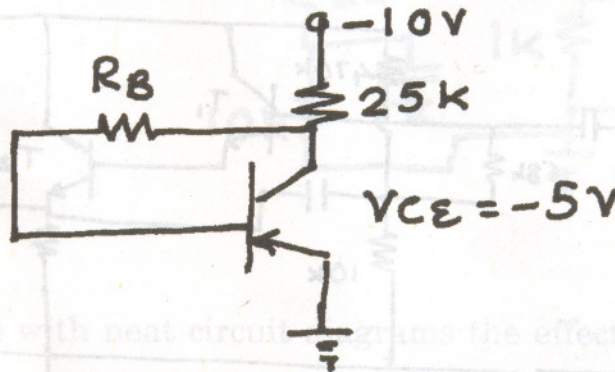
(c) Explain group codes. [4]

S.E. (Computer Engineering) (I Sem.) EXAMINATION, 2008**ELECTRONIC DEVICES AND CIRCUITS****(2003 COURSE)****Time : Three Hours****Maximum Marks : 100**

- N.B. :-**
- (i) Answers to the two Sections should be written in separate answer-books.
 - (ii) Neat diagrams must be drawn wherever necessary.
 - (iii) Figures to the right indicate full marks.
 - (iv) Make suitable assumptions wherever necessary.

SECTION I

1. (a) Determine the base resistance R_B for collector to base bias and calculate S . Assume Si transistor for $\beta = 50$. [6]

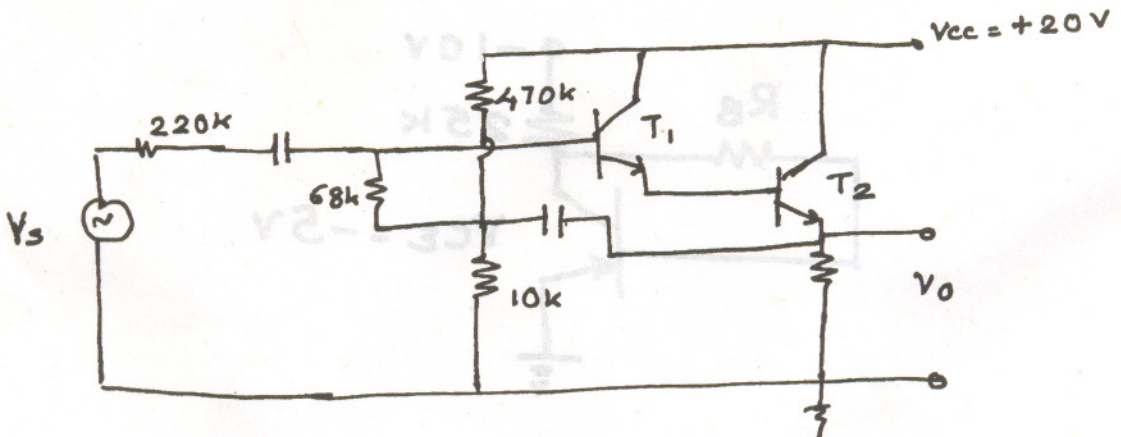


- (b) Explain the following : [12]
- (i) Self Bias Circuit
 - (ii) Operating point and its significance
 - (iii) Thermal runaway and thermal resistance.

2. (a) For a germanium transistor used in self bias arrangement with $\beta = 50$, $V_{CC} = 16 \text{ V}$, $R_C = 1.5 \text{ k}$. Find R_e , R_1 and R_2 required if the Q point is to be established at $V_{CE} = 8 \text{ V}$ and $I_C = 4 \text{ mA}$, for $s = 12$. [10]

(b) Explain diode and thermistor compensation techniques. [8]

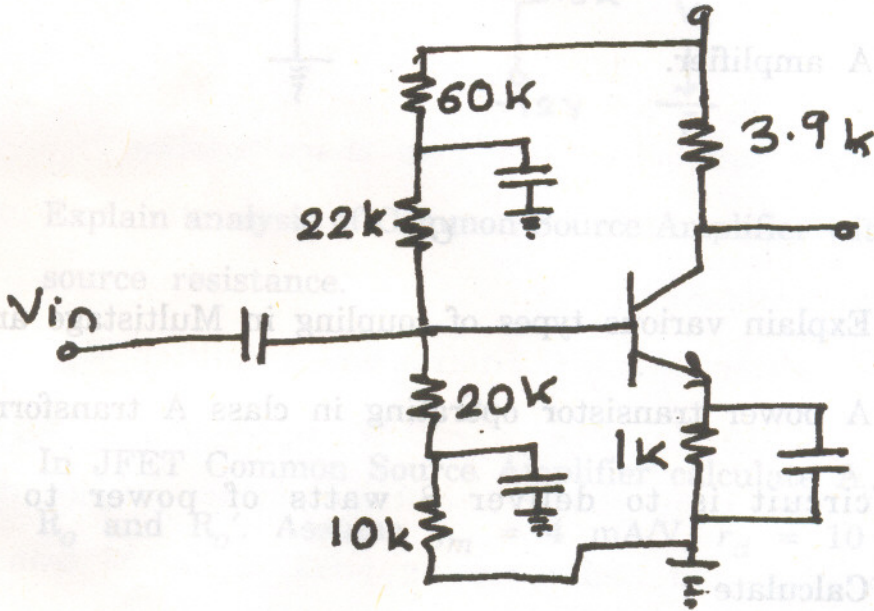
3. (a) In a bootstrapped Darlington pair with identical transistors calculate A_v , A_{vS} , R_i , R_o , transistor parameters are $h_{ie} = 1.1 \text{ k}$, $h_{fe} = 50$, $h_{re} = 2.4 \times 10^{-4}$, $h_{oe} = 2.5 \times 10^{-5}$. [10]



(b) Use approximate hybrid parameter analysis to obtain the equation for A_i , R_i and R_i' . [6]

Or

4. (a) For an amplifier shown below find A_v , R_i , R_o . The transistor has parameters $h_{ie} = 1.5 \text{ k}$, $h_{fe} = 50$, $h_{re} = h_{oe} = 0$, $R_s = 220 \text{ k}$, $R_3 = 68 \text{ k}$, $R_1 = 470 \text{ k}$, $R_2 = 10 \text{ k}$, $R_e = 1.2 \text{ k}$.



- (b) Explain with neat circuit diagrams the effect of biasing resistors on simple emitter follower circuit. How is this effect overcome by bootstrap emitter follower circuit? [10]

5. (a) Explain the necessity of cascading. [4]
- (b) In a push pull class B amplifier find the load resistance if turns ratio is 2, PD = 20 watts, collector voltage varies from 50 V to 20 V, $V_{CC} = 40$ V. [4]
- (c) List the drawbacks of series fed class A amplifier and explain how they are overcome, using transformer coupled amplifier. Draw a neat diagram of transformer coupled class A amplifier. [8]

Or

6. (a) Explain various types of coupling in Multistage amplifier. [6]
- (b) A power transistor operating in class A transformer coupled circuit is to deliver 8 watts of power to 8Ω load. Calculate :

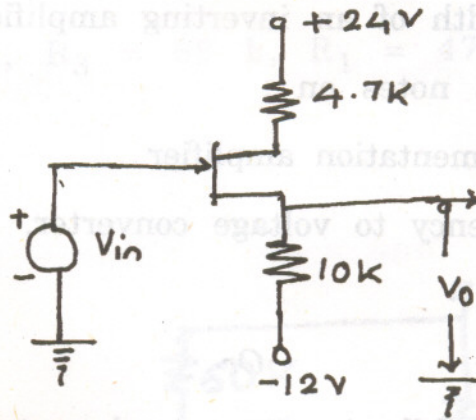
- (i) turns ratio
- (ii) collector circuit efficiency
- (iii) peak collector current
- (iv) Q point coordinates.

Assume ideal characteristics, $V_{CC} = 18$ V and $V_{min} = 0$ V. [10]

SECTION II

7. (a) A JFET has $I_{dss} = 5.6 \text{ mA}$, $V_p = -4 \text{ V}$. Find :
- (i) V_o for $V_i = 0 \text{ V}$ and $V_i = 10 \text{ V}$
 - (ii) V_i for $V_o = 0 \text{ V}$.

[8]



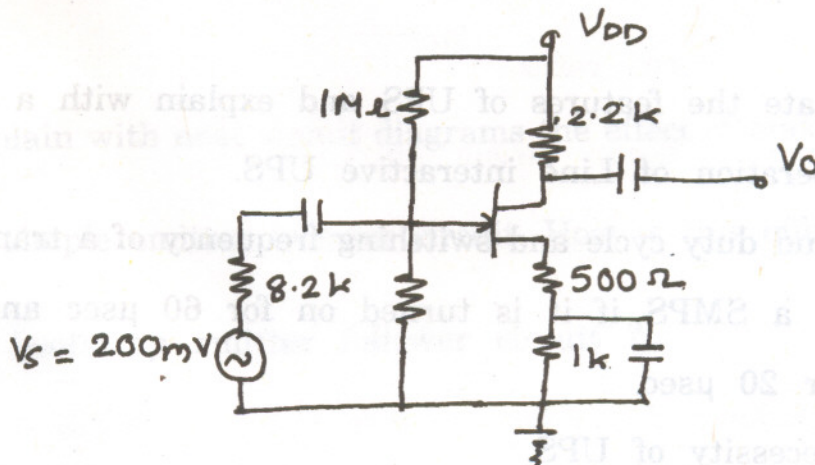
- (b) Explain analysis of Common Source Amplifier with and without source resistance.

[8]

Or

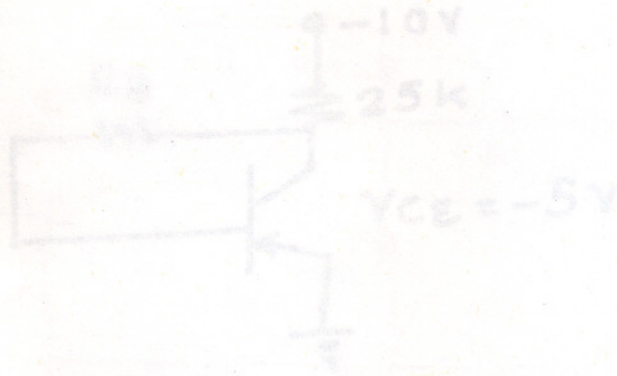
8. (a) In JFET Common Source Amplifier calculate A_v , A_{vs} , R_i , V_o , R_o and R_o' . Assume $g_m = 4 \text{ mA/V}$, $r_d = 10 \text{ k}\Omega$.

[8]



- (b) With the help of a diagram explain construction, drain and transfer characteristics and symbol of N-channel DMOSFET. [8]
9. (a) $R_l = 100 \Omega$, $R_f = 1 \text{ k}\Omega$, $R_s = 50 \Omega$, $C_C = 0.1 \mu\text{F}$. Determine the bandwidth of an inverting amplifier. [6]
- (b) Write short notes on : [12]
- (i) Instrumentation amplifier
- (ii) Frequency to voltage converter.
- Or
10. (a) Explain the following op-amp characteristics : [10]
- CMMR, slew rate, power supply rejection ratio, input impedance, output impedance.
- (b) In emitter coupled differential amplifier $R_E = 4.7 \text{ k}\Omega$, $V_{CC} = 10 \text{ V}$, $-V_{EE} = -10 \text{ V}$, $R_C = 2 \text{ k}\Omega$, $R_S = 50 \Omega$, $\beta = 100$. Draw the dc circuit for emitter coupled differential amplifier and find operating point of the Si transistor. [8]
11. (a) State the features of UPS and explain with a diagram the operation of Line interactive UPS. [8]
- (b) Find duty cycle and switching frequency of a transistor switch in a SMPS if it is turned on for $60 \mu\text{sec}$ and turned off for $20 \mu\text{sec}$. [4]
- (c) Necessity of UPS. [4]

12. (a) The gate current of SCR full wave rectifier is adjusted to 1.25 mA and the forward breakover voltage of SCR corresponding to the gate current is 150 V. If the applied voltage is 300 V, the load resistance is 120Ω and holding current is zero, find the firing angle, conduction angle, average output voltage and average current. [8]
- (b) Turn off process of SCR. [4]
- (c) Explain SCR as half wave rectifier. [4]



S.E. (Computer Engineering) (First Sem.) EXAMINATION, 2008

DIGITAL ELECTRONICS AND LOGIC DESIGN

(2003 COURSE)

Time : Three Hours

Maximum Marks : 100

N.B. :— (i) Answer Q. Nos. 1 or 2, 3 or 4, 5 or 6 from Section I and
Q. Nos. 7 or 8, 9 or 10, 11 or 12 from Section II.

(ii) Answers to the two Sections should be written in separate answer-books.

(iii) Neat diagrams must be drawn wherever necessary.

(iv) Figures to the right indicate full marks.

(v) Assume suitable data, if necessary.

SECTION I

1. (a) With the help of suitable example, explain the meaning of self complementing code. [2]

(b) Represent decimal number 327 in : [2]

(i) BCD code

(ii) Excess-3 code

(c) Find gray codes for the following binary numbers : [2]

(i) 11001100

(ii) 01011110

(d) Determine which bit, if any, is in error bit in the even parity hamming coded character 1100111. [4]

(e) Perform BCD subtraction using 9's complement method $(7)_{10} - (2)_{10}$. [2]

(f) With suitable examples, explain the following in boolean algebra : [6]

(i) Commutative law

(ii) Associative law

(iii) Distributive law

Or

2. (a) Convert the following octal numbers into its equivalent Hexadecimal, Binary and Decimal numbers : [12]

(i) $(76)_8$

(ii) $(0.7634)_8$

(iii) $(1567)_8$

(iv) $(65.04)_8$

(b) Explain the error correcting and detecting codes with suitable examples. [6]

3. (a) Draw three input standard TTL NAND gate circuit and explain its operation. [8]

(b) Explain the following characteristics of TTL logic families : [8]

(i) Power dissipation

(ii) Noise margin

(iii) Propagation delay

(iv) Fan out.

Or

4. (a) What is logic family ? Give the classification of logic families and also state and explain any *four* characteristics of digital ICS. [8]

(b) Draw and explain the TTL to CMOS and CMOS to TTL interfacing. [8]

5. (a) What is priority encoder ? Design a 4 : 2 priority encoder using NAND gate. [8]

(b) Draw and explain the block diagram of IC 7447 ? Explain the operation of each pin in detail. [8]

Or

6. (a) With the help of a circuit diagram explain the full subtractor using half subtractor. [8]

(b) Design and implement 16 : 1 multiplexer using 4 : 1 MUX IC. [8]

SECTION II

7. (a) Design and implement 4 bit up/down synchronous counter using MS-JK flip-flop with its truth table. Also draw timing diagram. [12]

(b) What is lockout condition ? How can it be avoided ? [6]

Or

8. (a) Explain how shift registers are used as : [6]
- (i) Serial to parallel converters
 - (ii) Parallel to serial converter.
- (b) Write short notes on : [6]
- (i) Ring counter
 - (ii) Johnson counter.
- (c) Draw and explain the circuit diagram of 3 bit register with the following facility : [6]
- (i) Parallel in serial out
 - (ii) Reset.

Or

10. (a) What is VHDL ? Write entity and architecture declaration for 2 input XOR and 2 input OR gate. Assume A and B as inputs and Z as output of logic gates. [8]
- (b) Describe different modelling styles of VHDL with suitable examples. [8]

11. Explain in detail the architecture of CPLD. Describe how to program CPLD ? List the various tools to design such devices. Also explain various design steps of circuits using CPLD. [16]

Or

12. (a) What is PLD ? Explain PAL, PLA, Generic Array and Simple PLDs. [8]

- (b) Implement the following function using PLA : [8]

$$f_1 = \Sigma m(0, 3, 4, 7)$$

$$f_2 = \Sigma m(1, 2, 5, 7)$$

S.E. (Comp. Engg.) (First Sem.) EXAMINATION, 2008

DATA STRUCTURES AND ALGORITHMS

(2003 COURSE)

Time : Three Hours

Maximum Marks : 100

N.B. :— (i) Answer *three* questions from Section I and *three* questions from Section II.

(ii) Answers to the two Sections should be written in separate answer books.

(iii) Neat diagrams must be drawn wherever necessary.

(iv) Figures to the right indicate full marks.

(v) Assume suitable data, if necessary.

SECTION I

1. (a) What are the steps followed in the development of a computer program ? Explain any *one* of them in detail. [6]

(b) Write an algorithm to compute the sum of digits of a given number. Justify that your algorithm satisfies all the characteristics of an algorithm. [6]

(c) Define data structure and give complete classification of data structures. [4]

Or

2. (a) Draw a flowchart to check whether a given integer is a perfect square of an integer. What is the time complexity of your algorithm ? [6]
- (b) Define algorithm. What are the characteristics of an algorithm ? [5]
- (c) What steps you will follow to select the best performing algorithm from given many alternative algorithms for solving a given problem ? [5]
3. (a) Explain the steps of fast transpose algorithm to compute a transpose of a given sparse matrix having maximum 'm' rows and 'n' columns. Obtain the time and space complexity of your algorithm. [8]
- (b) Consider integer array, `int arr [5][4]` declared in 'C' program. If the base address is 510, find the address of the element `arr [3][2]` with row major and column major representation of array. [5]
- (c) Using an array, represent the following polynomial $P(x)$ in computer memory : [5]
- $$P(x) : 10x^3y^2z - 8x^3y^3z^3 + 5xyz^2 + 10.$$

Or

4. (a) Define sparse matrix. How is it represented in computer memory using an array ? Write pseudo code in 'C' to add two sparse matrices having maximum 'm' rows and 'n' columns. What is the time complexity of your algorithm ? [8]
- (b) Write pseudo code in 'C' for the multiplication of two single variable polynomial. [5]
- (c) Define array and state the advantages and disadvantages of using arrays. [5]
5. (a) Write recursive pseudo code in 'C' to print first 'n' Fibonacci numbers assuming first and second Fibonacci number as 1. Give the trace of your procedure for $n = 4$ showing stack contents for every recursion. [6]
- (b) Define Stack. How is it represented in 'C' using array ? What are the operations necessary to implement the stack ? [5]
- (c) What do you mean by multi-stack ? What is the purpose of it ? Explain in brief any *one* application of multi-stack. [5]

Or

6. (a) Convert the following infix expression to its postfix form using stack. Show the contents of stack, input character and output string for each step.

$$(((a/b) * c) + (d/(e*f))) \quad [6]$$

(b) Define recursive function. Using recursion, write pseudo 'C' code to solve 'Tower of Hanoi' problem. [6]

(c) Define data structures required to implement multi-stack. [4]

SECTION II

7. (a) Define Queue. Write pseudo 'C' code to implement circular queue using array to perform the following operations :

(i) Addition of an element in queue.

(ii) Deletion of an element from queue.

(iii) Display front element in queue.

(iv) Display rear element in queue.

(v) Display all the elements in queue starting from front element. [8]

(b) Write a short note on Double Ended Queue. [4]

(c) Write pseudo 'C' code to implement input restricted double ended queue. [4]

Or

8. (a) Explain the implementation of Linear Queue. What are the disadvantages of a Linear Queue ? How are they overcome ? Explain in detail. [8]

(b) Write a short note on Priority Queue. [4]

(c) What is multi-queue ? Explain in brief any *one* application of multi-queue. [4]

9. (a) Write pseudo 'C' code to sort ' n ' numbers stored in an array in non-increasing order using Quick Sort. State its time and space complexity. Apply your algorithm to sort the following numbers in non-increasing order. Display the contents of an array in each pass :

23, 9, 100, 17, 45, 57, 79, 45. [8]

- (b) What do you mean by the term 'stability' with reference to sorting? Is Quick Sort a stable sort? Give *one* example where stability is important while sorting. [6]
- (c) Explain in brief the need for sorting the data. [4]

Or

10. (a) Write pseudo 'C' code to sort ' n ' numbers stored in array in non-decreasing order using Merge Sort. Obtain its time and space complexity. [8]
- (b) "External sorting calls for Internal Sorting as well." Justify. [5]
- (c) Write a short note on Index Sequential Search. [5]
11. (a) Explain Big O, Ω and θ notations used in performance measure of an algorithm. Write down performance measures for Selection Sort using these notations. [6]

(b) Explain the characteristics of 'Divide and Conquer' strategy of algorithms with reference to any suitable example. [6]

(c) Write a short note on Dynamic Programming Strategy. [4]

Or

12. (a) Why do we need to analyse the algorithm? What are the measures used to analyse the algorithm. [6]

(b) What are the characteristics of 'Greedy algorithmic strategy'? Explain with reference to 'Graph Coloring problem'. [6]

(c) Write a short note on 'Backtracking'. [4]

(c) Explain in brief the need for sorting the data. [4]

Or

10. (a) Write pseudo 'C' code to sort 'n' numbers stored in array in non-decreasing order using Merge Sort. Obtain its time and space complexity. [8]

(b) "External sorting calls for Internal Sorting as well." [5]

(c) Justify. [5]

(c) Write a short note on Index Sequential Search. [5]

11. (a) Explain Big O, Ω and θ notations used in performance measure of an algorithm. Write down performance measures for Selection Sort using these notations. [6]

S.E. (Computer Engg.) (First Semester) EXAMINATION, 2008**FINANCIAL AND INDUSTRIAL MANAGEMENT****(2003 COURSE)****Time : Three Hours****Maximum Marks : 100**

- N.B. :—** (i) Answer *three* questions from Section I and *three* questions from Section II.
- (ii) Answers to the two Sections should be written in separate answer-books.
- (iii) Neat diagrams must be drawn wherever necessary.
- (iv) Figures to the right indicate full marks.

SECTION I

1. (a) Explain the following principles of Management : [10]
- (i) Unity of command
- (ii) Remuneration
- (iii) Division of labour
- (iv) Espirit De Corps
- (v) Discipline.
- (b) Explain the function of Management. [6]

Or

- (a) Explain the contributions of F.W. Taylor to the thought of Scientific Management. [10]
- (b) Explain the concept of Management by Objectives (MBO). [6]

2. Explain the following :

- (i) Contract and conditions of valid contract. [5]
- (ii) Patents and copyrights. [6]
- (iii) E-business. [5]

Or

- (a) Discuss the importance of Engineering Economics. [6]
- (b) Explain the following : [10]
 - (i) E.R.P.
 - (ii) E-commerce.

3. (a) State the various forms of business and explain the joint stock companies in detail. [12]
- (b) Suggest a suitable organizational structure for a software company. [6]

Or

Write short notes on : [18]

- (i) Partnership
- (ii) Co-operatives
- (iii) Line and staff structure.

SECTION II

4. (a) Explain the various types and sources of recruitment. [10]
- (b) Discuss the barriers to effective communication. [8]

Or

- (a) Discuss McGregor's theory X and theory Y. [8]
(b) Explain the process of manpower planning. [10]

5. (a) What is cost ? Explain the components of cost and different types of cost. [10]
(b) What is capital ? What are its different types ? Explain. [6]

Or

Explain the following :

- (i) Budget and budgetary control. [8]
(ii) Shares and debentures. [8]

6. (a) Explain breakeven analysis with assumptions. [7]
(b) Explain the following ratios : [9]
(i) Current ratio
(ii) Debt-equity ratio
(iii) Inventory turnover ratio.

Or

- (a) Discuss the process of credit rating for software companies. [8]
(b) Explain the following concepts in brief : [8]
(i) Depreciation
(ii) Annuity.