3E1651

pRoll No. _____ Total No of Pages: 7

3E1651

B. Tech. III Sem. (Main / Back) Exam., Feb 2015

Computer Science

3CS1A Electronic Devices & Circuits

CS, IT

Instructions to Candidates:

*Attempt any **five questions,** selecting **one question** from **each unit.** All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination.

(Mentioned in form No.205)

1. NIL 2.NIL

UNIT – I

Q. 1 (a) Define Hall effect and explain the use of this effect in finding the conductivity of a sample. [8]

(b) Draw the output wave form in fig.1(b) [8]

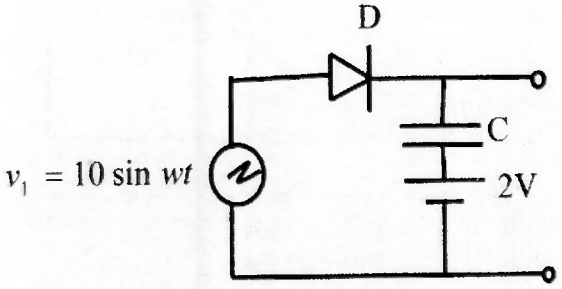

Fig.1(b)

OR

Q. 1 (a) If a silicon sample is doped with 10^{16} Boron atom per cm^3, then calculate its percentage change in conductivity. Assume Intrinsic carrier concentration $n_i = 10^{10}/cm^3$, electron mobility $\mu_n = 1400 \frac{cm^2}{}$

(b) What is continuity equation? [8]

Find its modified expression under -

(i) Thermal equilibrium condition, and

(ii) External electric field $\varepsilon = 0$

UNIT – II

Q. 2 (a) Find the operating point of Si-BJT circuit as shown in fig.2 (a) [10]

Assume

Current gain

$\beta = 50$ and

Reverse saturation

Current $I_{CBO} = 500\ \mu A$.

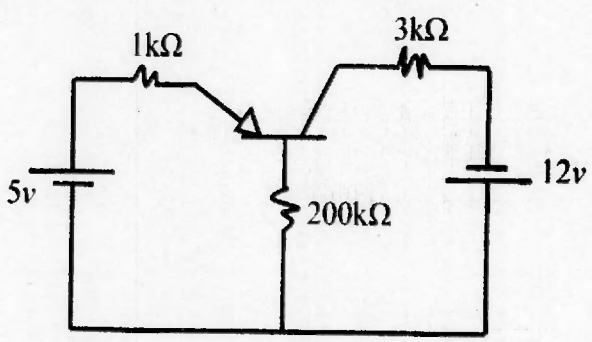

fig - 2 (a)

(b) Find the interrelation between h- parameter of a common emitter (CE) and common base (CB) configuration. **[6]**

OR

for fig. 2 (a″) **[8]**

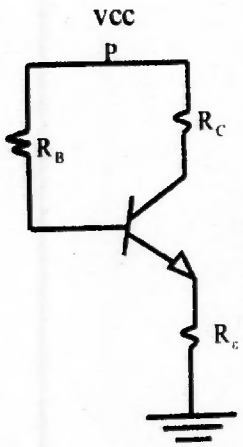

fig. 2 (a″)

(b) Draw the scheme for I_{co} compensation, in a BJT circuit. Also discuss the necessary conditions for it. **[8]**

UNIT – III

Q. 3 Find the overall current and voltage gain of a double stage (CC - CC) amplifier as shown in fig.3. [16]

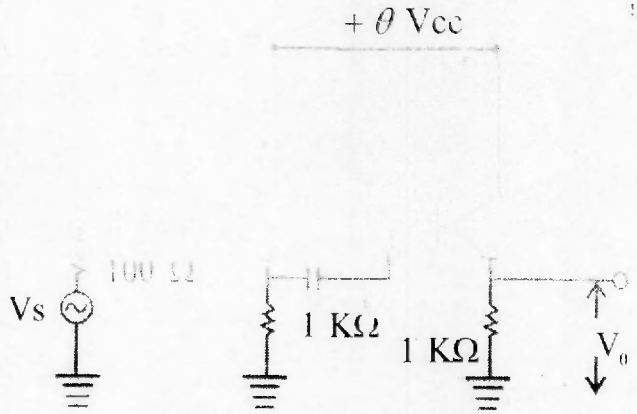

fig – 3

OR

Q. 3 (a) Prove that the FET V-I relation is given by

$$Ids = Idss\left(1-\frac{V_{gs}}{Vp}\right)^2$$

When it operates in saturation region. [8]

(b) Draw the FET amplifier in common drain configuration and find its voltage gain in low frequency. [8]

UNIT – IV

Q. 4 (a) What is current shunt feedback? Find the modified I/P and O/P resistance due to this feedback. [8]

(b) Find the feedback factor (β), type of feedback and gain with feedback in circuit [8]

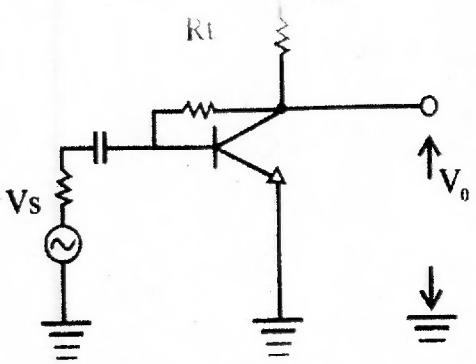

fig - 4(1)

OR

Q. 4 (a) Write the analysis step of a feedback amplifier shown in fig. 4 (11) for finding R_{if} and R_{of} [10]

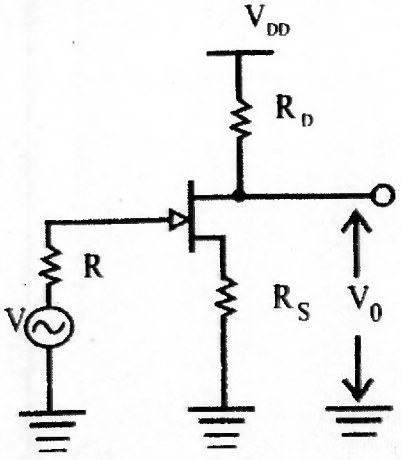

Fig - 4 (11)

(b) How is feedback used in amplifiers and oscillators to modify their characteristics? [6]

UNIT - V

Q. 5 (a) Design a Monostable (using BJT) Multivibrator to give the output pulse duration of 10 millisecond. [8]

(b) Draw the output waveform in fig. 5 [8]

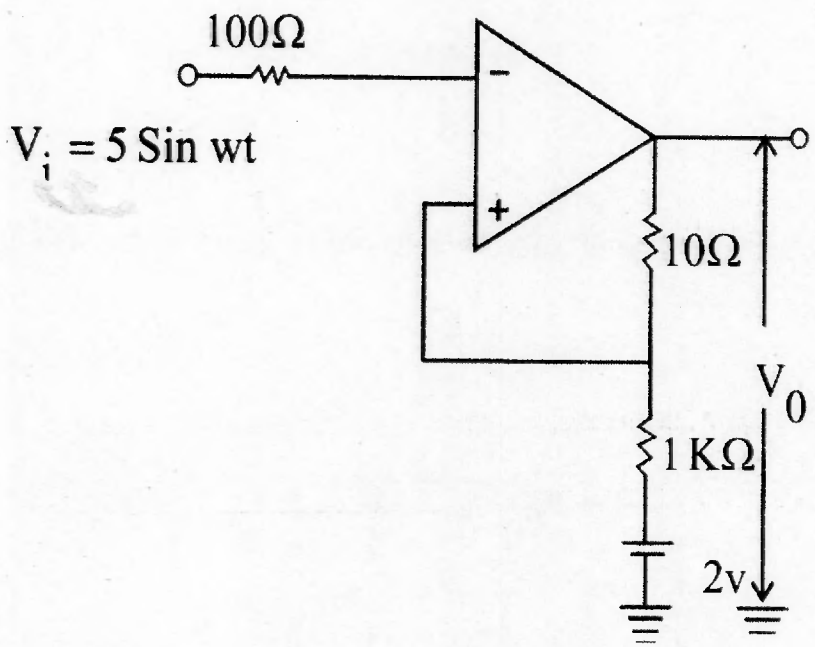

Fig.5

Q. 5 Design following -

(a) A 10 KHz wein bridge oscillator [8]

(b) A 10 KHz clock generator using astable multivibrator. [8]

3E1652

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3E1652

B. Tech. III Sem. (Main/ Back) Exam., Feb. 2015

Electronic Instrumentation & Control Engineering

3EI2A Data Structure & Algorithms

Common for EC, EI, EX, CS, IT

Back: 24

Instructions to Candidates:

*Attempt any **five questions,** selecting **one question** from **each unit.** All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination.

(Mentioned in form No. 205)

1. NIL 2.NIL

UNIT – I

Q. 1 (a) Describe the performance of the algorithms used to multiply two N×N matrices using suitable measures of complexity. You should make clear what operations you are counting, what is the worst-case that you are considering, (and, perhaps, average-case and best-case, where appropriate). Consider also space complexity. [8]

(b) Given an array and a number, find two integers that sums to the given number. [8]

OR

Q. 1 What is the worst-case complexity of each of the following code fragments?

[8]

(a) Two loops in a row:

```
for (i = 0; i < N; i ++) {
        sequence of statements
}
for (j = 0; j < M; j++) {
        sequence of statements
}
```

How would the complexity change if the second loop went to N instead of M?

```
}
for (k = 0; k < N; k++) {
        sequence of statements
}
```

UNIT – II

Q. 2 (a) Derive an algorithm which converts infix expression to its postfix expression. Also write algorithm which evaluates the postfix expression. [8]

(b) Write the insertion and deletion algorithms for the following data structures: [8]

(i) Circular Queue

(ii) Stack

(iii) Dequeue

OR

Q. 2 (a) Convert following expression in its equivalent postfix expression. [8]

(i) A* B + C

(ii) A* B ^ C + D

(iii) A * (B + C * D) + E

(b) Explain the concept of recursion using stack with a suitable example. What are the difficulties in dealing with infix expressions? [8]

UNIT – III

Q. 3 (a) Consider the following function that takes reference to head of a Doubly Linked List as parameter. Assume that a node of doubly linked list has previous pointer as *prev* and next pointer as *next*.

```
Void fun (struct node ** head_ref)
{
    struct node * temp = NULL;
    {
        temp = current – > prev;
        current - > prev = current - > next;
        current - > next = temp;
        current  = current - > prev;
    }
    if (temp ! = NULL)
        *head_ref = temp – prev;
}
```

Assume that reference of head of following doubly linked list is passed to above function 1 < -- > 2 < -- > 3 < -- > 4 < -- > 5 < -- > 6, what should be the modified linked list after the function call? [8]

(b) Which sorting algorithms can be used to sort a random linked list with minimum time complexity? [8]

OR

Q. 3 (a) Write the algorithm for insertion and deletion in doubly and circularly connected linear Linked lists. [8]

(b) What does the following function do for a given Linked List with first node as *head*? [8]

```
void fun1 (struct node* head)
{
    if (head = = NULL)
        return;
    fun1 (head - > next);
    printf ("%d ", head - > data);
}
```

UNIT – IV

Q. 4 (a) Create an AVL tree for the following list of elements. [8]

L = < 5, 4, 3, 2, 1, 6, 7, 8, 9, 10 >

(b) Explain the threaded binary Tree. Evaluate the time complexity of insertion, deletion and traversal in threaded and ordinary binary trees. [8]

OR

Q. 4 (a) Explain the various applications of trees for representation of sets. [8]

(b) Explain the concept of balanced trees. Write pseudo code for insertion into and deletion form AVL tree. [8]

UNIT – V

Q. 5 (a) Analyze the running time for the bubble sort algorithm. Argue upon its worst case, best case, and average case running time. [8]

(b) Sort the following list in increasing order using quick sort technique and argue upon its running time. [8]

L = < 1, 3, 5, 6, 8, 10, 13, 18 >

OR

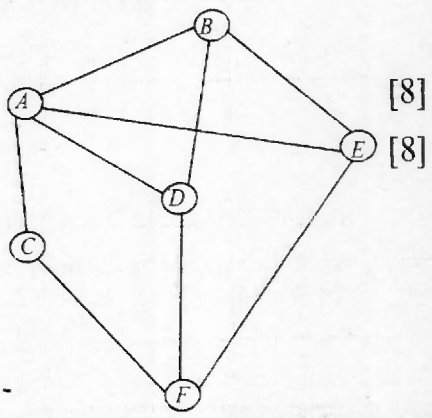
Q. 5 (a) Prove that Heap sort, Merge sort, Quick sort takes Ω (n log n) tie in the worst case. [8]

(b) For the graph shown below find the following: [8]

(i) Adjacency list representation.

(ii) Adjacency matrix representation.

(iii) Adjacency multilist representation.



3E1653

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3E1653

B. Tech. III Sem. (Main/ Back) Exam., Feb. 2015

Computer Science

3CS3A Digital Electronics

Common for EE, EX, EC, EI, CS, IT, AI

Back: 24

Instructions to Candidates:

*Attempt any **five questions,** selecting **one question** from **each unit.** All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination.

(Mentioned in form No. 205)

1. NIL 2.NIL

UNIT – I

Q. 1 (a) Find the range of signed decimal numbers that can be represented by 6 – bit is complement numbers. [4]

(b) The two numbers represented in signed 2's complement form are p = 11101101 and Q= 11100110. Find the value obtained in signed 2's complement form for P – Q. [5]

(c) Convert following: [5]

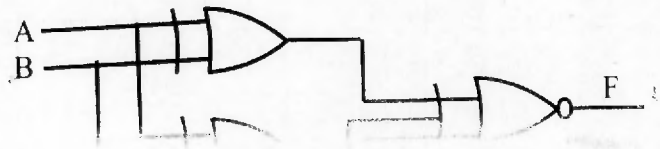
(i) $(F9.2C)_{16}$ into octal.

(ii) $(72.75)_8$ into Hexadecimal.

(d) Decimal equivalent of Excess – 3 code (11001010.0101) [2]

OR

Q. 1 (a) For the output 'F' to be 'l' the logic circuit shown in figure find the values of A, B & C [5]

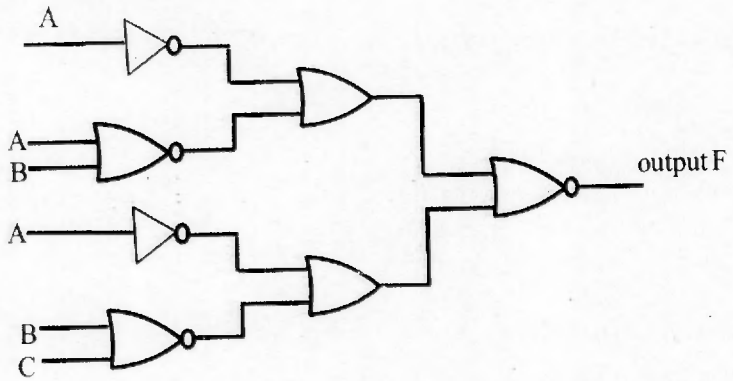


method: [P]

(i) 342.7 – 108.9

(ii) 206.4 – 507.6

(c) Draw the simplest possible logic diagram that implements the output of the logic diagram shown below: [6]



UNIT – II

Q. 2 With the help of a neat diagram explain the working of: [16]

(a) a MOS inverter

(b) a two I/P MOS NAND gate, and

(c) a two input CMOS NOR gate

OR

Q. 2 (a) What are the merits and demerits of various logic families? [4]

(b) With the help of a neat diagram, explain the working of a two – input ECL OR/NOR gate. [7]

(c) With the help of neat circuit diagrams explain interfacing of various logic families.

Q. 3 (a) Using the Quine – McCluskey method of tabular reduction minimize the function

$f(W, X, Y, Z) = \sum m(0, 1, 5, 7, 8, 10, 14, 15)$ [12]

(b) Simplify the expression and implement with NAND Gate.

$F = A\overline{B} + ABD + AB\overline{D} + \overline{A}\overline{C}\overline{D} + \overline{A}B\overline{C}$ [4]

OR

Q. 3 (a) Simplify the expression and implement with NAND Gate circuit.

$G = BD + BC\overline{D} + A\overline{B}\overline{C}\overline{D}$ [4]

(b) Reduce the expression: [12]

$f = \sum m(1, 5, 6, 12, 13, 14,) + d(2, 4)$ and implement the minimal expression in universal logic.

UNIT – IV

Q. 4 (a) Implement the following logic function using an 8×1 mix. [6]

$F(A, B, C, D) = \sum m(1, 3, 4, 11, 12, 13, 14, 15)$

(b) Design a 4 bit Binary to Gray Code Converter and draw the logic diagram. [10]

OR

Q. 4 (a) Design a 4 bit Binary to BCD code converter. [10]

(b) With the help of gate level logic diagram and truth table, explain an octal to binary encoder. [6]

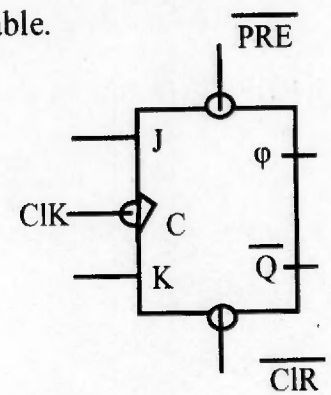
UNIT – V

Q. 5 (a) Define the following terms with relation to flip flops: [5]

(i) set up time

(v) clear.

(b) For the block diagram shown, draw the schematic using NAND gates and explain operation with help of truth table. [6]



(c) Convert the J –K flip flop into [5]

(i) T flip flop

(ii) D flip flop

OR

Q. 5 (a) Design a synchronous Modulo – 10 up/down counter using T FFs. [12]

(b) Draw a state diagram and logic diagram of 4 bit ring counter using D Flip flops. [4]

--------x-------x------

3E1654

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3E1654

B. Tech. III Sem. (Main / Back) Exam., Feb. 2015
Computer Engineering & Information Tech.
3CS4A & 3IT4A Object Oriented Programming
Common for EE, EX, CS & IT

Time: 3 Hours **Maximum Marks: 80**

*Attempt any **five questions,** selecting one **question** from **each unit.** All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination.

1. NIL 2. NIL

UNIT – I

Q. 1 (a) What do you understand by self referential structures. Explain it's application with suitable example. [8]

(b) Explain flow Array of structures is coveted initialized and used with the help of suitable example. [8]

OR

Q. 1 (a) Create a structure for student data, fill the date by using a function by passing that structure instance to function. Write C/C++ code. [8]

(b) State the advantages of object oriented programming. [4]

(c) Explain pointer to structure with example. [4]

UNIT – II

Q. 2 (a) Why 'New' is better than 'malloc' for dynamic memory allocation. [6]

(b) Discuss various use of :: operator in C++. [5]

(c) Discuss difference between Pointers & References in C++. [5]

OR

Q. 2 (a) What is the use of 'this' pointer. Explain with example. [8]

(b) What is friend function and friend class. Discuss with suitable C++ code. [8]

UNIT – III

Q. 3 Overload 'New' operator without overriding it. Write workable code. [16]

UNIT – IV

Q. 4 What happens to Private, Public & Protected data of class B. When a class D is derived from B. [16]

(a) Publically

(b) Protectedly

(c) Privately

Explain with suitable example.

OR

Q. 4 Explain Run time polymorphism, it's advantages and how it is implemented in C++.

Also discuss abstract class and its purpose. [16]

UNIT – V

Q.5 Write short notes on following:

(a) Type of Inheritance [8]

(b) Exception Handling [8]

OR

Q.5 (a) Standard Template Libraries. [8]

(b) iostream.h [8]

--------x-------x------

3E1655

Roll No. _____ Total No of Pages: 3

3E1655

B. Tech. III Sem. (Main / Back) Exam., Feb. 2015

Computer Science

3CS5A Fundamentals of Linux Shell Programming

CS, IT

Back: 24

Instructions to Candidates:

*Attempt any **five questions,** selecting **one question** from **each unit.** All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. **Any** data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination.

(Mentioned in form No.205)

1. NIL 2.NIL

UNIT – I

Q. 1 Explain about following LINUX commands with suitable example: - [2×8=16]

(i) grep

(ii) cut

(iii) diff

(iv) echo

(v) touch

(vi) cat

(vii) chmod

(viii) sort

OR

Q. 1 Write commands for following (LINUX / UNIX):-

(i) Copying a file from Home directory to root directory [4]

(ii) Rename a file [4]

(iii) A text file having 100 lines, you need to display line number 40 to 60. [8]

UNIT – II

Q. 2 What do you understand by system calls in UNIX? Discuss message passing mechanism, between two processes in UNIX using system calls. [16]

OR

Q. 2 Discuss mode of operation in Vi editor. Also discuss commands available in Vi editor for string searching and substitution. [16]

UNIT – III

Q. 3 With the help of suitable diagram, discuss X- windows client /server system. [16]

OR

Q. 3 Write codes for X-windows system to create menus and event handling. [16]

UNIT-IV

Q. 4 (a) Write a single line LINUX code (use pipes) to calculate number of files in current directory. [5]

(b) Write LINUX code to display file creating time of those files whose name starts with 'a' and is of 5 character long. [5]

Q. 4 (a) Discuss at least 4 environment variables used in BASH shell. [8]

(b) Write a sample BASH script for string concatenation. Also explain the structure of script. [8]

UNIT-V

Q. 5 Write short notes on following: -

(a) awk utility [8]

(b) Job control in shell programming. [8]

OR

Q. 5 Write and explain the syntax of all available control structures in shell programming of Unix/ Linux. Give suitable examples to demonstrate. [16]

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3E1656

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3E1656

B. Tech. III Sem. (Main / Back) Exam., Feb. 2015

Computer Science

3CS6A Advanced Engineering Mathematics – I

Common for CS, IT

Time: 3 Hours Maximum Marks: 80

Min. Passing: 32

Back: 24

Instructions to Candidates:

*Attempt any **five questions,** selecting **one question** from **each unit.** All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination.

(Mentioned in form No.205)

1. Graph Paper 2.NIL

UNIT – I

Q. 1 (a) Find the extreme points of the function. [8]

$f(x_1, x_2) = x_1^3 + x_2^3 + 2x_1^2 + 4x_2^2 + 6$

(b) Find the dimensions of a box of largest volume that can be inscribed in sphere of radius a. [8]

OR

Q. 1 (a) Explain applications of optimization techniques in Engineering [8]

(b) Optimize $z = \frac{1}{2}(x^2 + y^2 + z^2)$ [8]

Subject to $x - y = 0$; $x + y + z - 1 = 0$.

UNIT – II

Q. 2 (a) Solve the following linear programming problem by graphical method: [8]

Min $z = 2x_1 + 3x_2$

S.t. $x_1 + x_2 \leq 4$

$6x_1 + 2x_2 \geq 8$

(b) Solve the following transportation problem: [8]

To → / From ↓	1	2	3	Available ↓
A	16	19	12	14
B	22	13	19	16
C	14	28	8	12
Demand	10	15	17	

OR

Q. 2 (a) Solve the following problem. [8]

Minimize $Z = \frac{15}{2} x_1 - 3x_2$

Subject to $3x_1 - x_2 - x_3 \geq 3$

$x_1 - x_2 + x_3 \geq 2$

and $x_1, x_2, x_3 \geq 0$

(b) Write the dual of the linear programming problem: [8]

Min $Z = 2x_1 + 3x_2 + 4x_3$

Subject to $2x_1 + 3x_2 + 5x_3 \geq 2$

$3x_1 + x_2 + 7x_3 = 3$

$x_1 + 4x_2 + 6x_3 \leq 5$

and $x_1, x_2 \geq 0$; x_3 is unrestricted in sign

hat –

$a^{p-1} \equiv 1 \bmod p.$ [8]

(b) Show that $z_5 = \{0, 1, 2, 3, 4\}$ is an abelian group for the operation $+_5$ defined as. [8]

$$a +_5 b = \begin{cases} a+b & \text{if } a+b<5 \\ a+b-5 & \text{ij } a+b\geq 5 \end{cases}$$

OR

Q. 3 (a) Define the following - [4 × 2 = 8]

(i) Sieve of Eratosthenes

(ii) Legendre Symbol

(b) Prove that a non-void subset H of a group G is a subgroup

iff $a \in H, b \in H \Rightarrow ab^{-1} \in H$ [8]

UNIT – IV

Q. 4 (a) Find $L\left\{\frac{\text{Sint}}{t}\right\}$ and then prove that $\int_0^\infty \frac{\text{Sint}}{t} dt = \frac{\pi}{2}$ [8]

(b) A semi infinite solid $x > 0$ is initially at temperature zero. At time $t > 0$, a constant temperature $v_0 > 0$ is applied and maintained at the face $x = 0$. Find the temperature at any point of the solid at any time $t > 0$. [8]

OR

Q. 4 (a) Find $L^{-1}\left\{\frac{3s+7}{\quad}\right\}$ [8]

UNIT – V

Q. 5 (a) Using Sterling's formula, find f (28), [8]

Given f (20) = 49225, f (25) = 48316, f (30) = 47236, f (35) = 45926, f (40) = 44306.

(b) Use Euler's modified method to solve [8]

$\frac{dy}{dx} = x^2 + y$ with y (0) = 0.94. Find y (0.1).

OR

Q.5 (a) Find $\frac{dy}{dx}$ at x = 5 from the following table - [8]

x	0	2	3	4	7	9
y	4	26	58	112	466	922

(b) Use Milne's method to find y (0.8) from - [8]

$\frac{dy}{dx} = 1 + y^2$

Give y(0) = 0, y(0.2) = 0.2027, y(0.4) = 0.4228, y(0.6) = 0.6841.

--------x--------x-------

3E2078

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3E2078

B. Tech. III Sem. (Back) Exam., Feb. 2015

Computer Science

3CS6.3 (O) Elective – Management Information Systems

CS. IT

Back: 24

Instructions to Candidates:

*Attempt any **five questions,** selecting **one question** from **each unit.** All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination.

(Mentioned in form No.205)

2.NIL

UNIT – I

Q. 1 (a) What is MIS? Explain the role of MIS in an organization. [8]

(b) Explain the concept of management by exception & management effectiveness using MIS. [8]

OR

Q. 1 (a) Explain various challenges related with information security. [8]

(b) Give concept of security threats controlling and management in MIS. [8]

UNIT-II

Q. 2 What is Business Process Reengineering? Explain its relationship with MIS with the help of appropriate example. [16]

OR

Q. 2 Write short notes on:-

(a) OO- Technology and MIS relationship [8]

(b) Information and Knowledge [8]

OR

Q. 3 (a) Give application of Marketing Management in Service Sector [8]

(b) Discuss application of MIS in manufacturing sector using for product management. [8]

UNIT-IV

Q. 4 With the help of a case study explain application of SAP Technologies in manufacturing sector. [16]

OR

Q. 4 Write short notes on:-

(a) EMS & MIS [6]

(b) ERP benefits & implementation [10]

UNIT-V

Q. 5 Write technical notes on -

(a) MIS in web environment [8]

(b) Web enabled business management [8]

OR

Q. 5 Write short notes on -

(a) Electronic payment systems [6]

(b) Database and client server architecture [10]

--------x--------x--------