USN | | | | | | | | | | | **06MAT31**

Third Semester B.E. Degree Examination, May/June 2010
Engineering Mathematics – III

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions, selecting at least TWO questions from each part.***

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

PART – A

1 a. Expand the function $f(x) = x - x^2$ in the interval $-\pi < x < \pi$. Deduce that $\frac{\pi^2}{12} = \frac{1}{1^2} - \frac{1}{2^2} + \frac{1}{3^2} - \frac{1}{4^2}$ .... **(07 Marks)**

b. Find the half-range cosine series for the function $f(x) = (x-1)^2$ in $0 < x < 1$. **(07 Marks)**

c. The following table gives the variations of periodic current over a period

t (sec) :	0	$T/6$	$T/3$	$T/2$	$2T/3$	$5T/6$	T
A (amp) :	1.98	1.30	1.05	1.30	-0.88	-0.25	1.98

Show that there is a direct current part of 0.75 amp in the variable current and obtain the amplitude of the 1st harmonic. **(06 Marks)**

2 a. Express the function $f(x) = \begin{cases} 1, & |x| < 1 \\ 0, & |x| > 1 \end{cases}$ as a Fourier integral and hence evaluate $\int_0^\infty \frac{\text{Sin}x}{x} dx$. **(07 Marks)**

b. Find Fourier sine transform of $\frac{1}{x}e^{-ax}$. **(07 Marks)**

c. Use convolution theorem to find the inverse Fourier transform of $\frac{1}{(1+s^2)^2}$ given that $\frac{2}{1+s^2}$ is the Fourier transform of $e^{-|x|}$. **(06 Marks)**

3 a. Form the partial differential equation by eliminating the arbitrary function from $Z = y^2 + 2f\left(\frac{1}{x} + \log y\right)$. **(07 Marks)**

b. Solve $\frac{\partial^2 z}{\partial x \partial y} = \text{Sin } x \text{ Sin } y$, given that $\frac{\partial z}{\partial x} = -2 \text{ Sin} y$, when $x = 0$; and $z = 0$ when y is an odd multiple of $\pi/2$. **(07 Marks)**

c. Solve $x(y^2 - z^2)p + y(z^2 - x^2)q = z(x^2 - y^2)$. **(06 Marks)**

4 a. Derive the one dimensional heat equation in the standard form. **(07 Marks)**

b. Obtain the various solutions of the Laplace's equation $\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} = 0$ by the method of separation of variables. **(07 Marks)**

c. A string stretched between the two fixed points (0, 0) and (1, 0) and released at rest from the position $y = \lambda \text{ Sin}(\pi x)$. Show that the formula for its subsequent displacement $y(x, t)$ is $\lambda \text{ Cos}(c\pi t) \text{ Sin}(\pi x)$. **(06 Marks)**

PART – B

5 a. Show that a real root of the equation tan x + tan hx = 0 lies between 2 and 3. Then apply the regula falsi method to find the third approximation. **(07 Marks)**

b. Apply Gauss – Jordan method to solve the system of equations:
$2x + 5y + 7z = 52$; $2x + y - z = 0$; $x + y + z = 9$. **(07 Marks)**

c. Use power method to find the dominant eigen value and the corresponding eigen vector of the matrix $A = \begin{bmatrix} 2 & -1 & 0 \\ -1 & 2 & -1 \\ 0 & -1 & 2 \end{bmatrix}$ with the initial eigen vector as $[1, 1, 1]^T$. **(06 Marks)**

6 a. Under the suitable assumptions find the missing terms in the following table:

x :	-0.2	0.0	0.2	0.4	0.6	0.8	1.0
f (x) :	2.6	-	3.4	4.28	-	14.2	29

(07 Marks)

b. Use Newton's divided difference formula to find f (4) given :

x :	0	2	3	6
f (x) :	-4	2	14	158

(07 Marks)

c. Using Simpson's $\frac{3}{8}^{th}$ rule, evaluate $\int_0^{0.3} \sqrt{1 - 8x^3}\, dx$, by taking 7 ordinates. **(06 Marks)**

7 a. Solve the variational problem $\delta \int_0^{\pi/2} \left((y)^2 - (y')^2\right) dx$ under the conditions y (0) = 0, $y\left(\frac{\pi}{2}\right) =$ 2. **(07 Marks)**

b. Find the curve on which the function $\int_0^{\pi/2} \left[(y)^2 - (y')^2 - y \sin x\right] dx$ under the conditions $y(0) = y\left(\frac{\pi}{2}\right) = 0$, can be extremised. **(07 Marks)**

c. Prove that the catenary is the plane curve which when rotated about a line (x – axis) generates a surface of revolution of minimum area. **(06 Marks)**

8 a. Find the Z – transform of i) n^2 ; ii) $n\, e^{-an}$. **(07 Marks)**

b. Prove that : i) $Z(\cos n\theta) = \dfrac{z(z - \cos\theta)}{z^2 - 2z\cos\theta + 1}$; ii) $z(\sin n\theta) = \dfrac{z \sin\theta}{z^2 - 2z\cos\theta + 1}$ **(07 Marks)**

c. Find the inverse Z – transform of $\dfrac{Z}{(Z-1)(Z-2)}$. **(06 Marks)**

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USN 1KS09EC409 **MATDIP301**

Third Semester B.E. Degree Examination, May/June 2010
Advanced Mathematics – I

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions.***

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

1 a. Express the complex number $\frac{(1+i)(1+3i)}{1+5i}$ in the form x + iy. **(06 Marks)**

b. Prove that $(1+i)^n + (1-i)^n = 2^{\frac{n}{2}+1}\cos\left(\frac{n\pi}{4}\right)$. **(07 Marks)**

c. Expand $\cos^8\theta$ in a series of cosines multiples of θ. **(07 Marks)**

2 a. Find the n^{th} derivative of $e^{ax}\sin(bx + c)$. **(06 Marks)**

b. If y = a cos (log x) + b sin (log x), prove that $x^2 y_{n+2} + (2n + 1)xy_{n+1} + (n^2 + 1)y_n = 0$. **(07 Marks)**

c. Find the n^{th} derivative of $\frac{x}{(x-1)(2x+3)}$. **(07 Marks)**

3 a. State Taylor's theorem and expand the polynomial $2x^3 + 7x^2 + x - 6$ in powers of (x -1). **(06 Marks)**

b. Expand tan x in ascending powers of x using MacLaurin's theorem upto the term containing x^4. **(07 Marks)**

c. If $Z = \frac{x^2+y^2}{x+y}$ prove that $\left(\frac{\partial z}{\partial x} - \frac{\partial z}{\partial y}\right)^2 = 4\left(1 - \frac{\partial z}{\partial x} - \frac{\partial z}{\partial y}\right)$. **(07 Marks)**

4 a. If $u = \tan^{-1}\left(\frac{x^3+y^3}{x-y}\right)$, prove that $x\frac{\partial u}{\partial x} + y\frac{\partial u}{\partial y} = \sin 2u$. **(06 Marks)**

b. If u = f(x, y) where x = r cos θ and y = r sin θ, prove that $\left(\frac{\partial u}{\partial x}\right)^2 + \left(\frac{\partial u}{\partial y}\right)^2 = \left(\frac{\partial u}{\partial r}\right)^2 + \frac{1}{r^2}\left(\frac{\partial u}{\partial \theta}\right)^2$. **(07 Marks)**

c. If $u = x^2 - 2y$, $v = x + y + z$ and $w = x - 2y + 3z$, find the value of $J\left(\frac{u, v, w}{x, y, z}\right)$. **(07 Marks)**

5 a. Obtain the reduction formula for $\int \sin^m x \cos^n x \, dx$. **(06 Marks)**

b. Evaluate $\int_0^a \frac{x^7}{\sqrt{a^2 - x^2}} dx$. **(07 Marks)**

c. Evaluate $\int_0^1 \int_0^x e^{\left(\frac{y}{x}\right)} dy\, dx$. **(07 Marks)**

6 a. Evaluate $\int_0^1 \int_0^{\sqrt{1-x^2}} \int_0^{\sqrt{1-x^2-y^2}} xyz\,dz\,dy\,dx$. (06 Marks)

b. Prove that $\beta(m,n) = \frac{\lceil m \lceil n}{\lceil m+n}$. (07 Marks)

c. Show that $\int_0^{\pi/2} \sqrt{\sin\theta}\,d\theta \times \int_0^{\pi/2} \frac{d\theta}{\sqrt{\sin\theta}} = \pi$. (07 Marks)

7 a. Solve $3\,e^x \tan y\,dx + (1-e^x)\sec^2 y\,dy = 0$. (06 Marks)

b. Solve $x^2 y\,dx = (x^3 + y^3)\,dy$. (07 Marks)

c. Solve $x\frac{dy}{dx} + y = x^3 y^6$. (07 Marks)

8 a. Solve $\frac{d^2y}{dx^2} + \frac{dy}{dx} = x^2 + 2x + 4$. (06 Marks)

b. Solve $\frac{d^2y}{dx^2} + 3\frac{dy}{dx} + 2y = 4\cos^2 x$. (07 Marks)

c. Solve $\frac{d^3y}{dx^3} + 2\frac{d^2y}{dx^2} + \frac{dy}{dx} = e^{-x} + \sin 2x$. (07 Marks)

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Third Semester B.E. Degree Examination, May/June 2010

Electronic Circuits

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions, selecting at least TWO questions from each part.***

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

PART – A

1 a. Explain positive clipper and negative clipper, with necessary diagrams. **(08 Marks)**

b. For the circuit shown in, Fig. Q1(b) :
i) Sketch the output voltage waveform ii) What is the maximum positive output voltage?
iii) What is the maximum negative output voltage? **(06 Marks)**

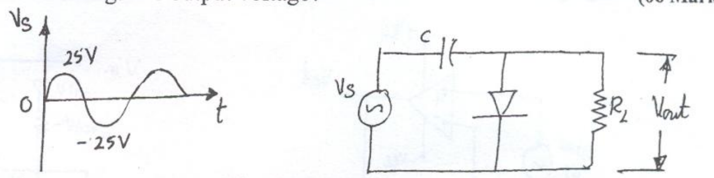

Fig. Q1(b)

c. Explain SCHOTTKY DIODE construction and its application. **(06 Marks)**

2 a. Explain with a neat circuit diagram, voltage divider bias amplifier by mentioning the importance of bypass capacitor. **(06 Marks)**

b. Obtain the graphical determination of AC emitter resistance of diode. **(06 Marks)**

c. Draw the DC and AC equivalent circuits of voltage divider bias amplifier shown in Fig. Q2(c). **(08 Marks)**

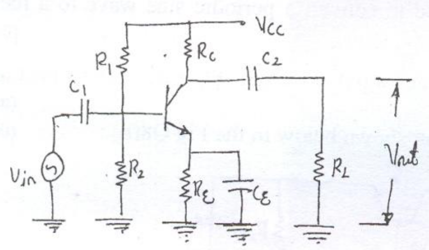

Fig. Q2(c)

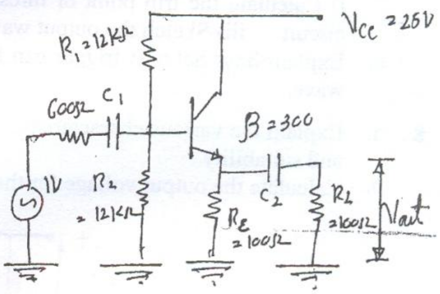

Fig. Q3(c)

3 a. Obtain the expression for voltage gain of single stage CE voltage-divider bias amplifier using π-model. **(08 Marks)**

b. Discuss trouble shooting of DC and AC circuits in voltage amplifier. **(06 Marks)**

c. For the circuit shown in, Fig. Q3(c), calculate the voltage of output impedance. **(06 Marks)**

4 a. Explain power gain interms of voltage and current gain in power amplifier. **(06 Marks)**

b. Show that the maximum efficiency of transformer coupled class A power amplifier is 50%. **(08 Marks)**

c. In a class C power amplifier V_{CC} = 30 V; R_L = 10 k Ω current drain I_{dc} = 0.4 mA peak–to–peak output voltage $V_{out(p-p)}$ = 30 V. Calculate i) DC input power ii) AC input power iii) Efficiency. **(06 Marks)**

PART – B

5 a. Explain the principle of operation and structure of n-channel depletion mode MOSFET, with a neat sketch. **(06 Marks)**

b. Discuss CMOS inverter with a neat circuit diagram, along with the transfer characteristics. **(06 Marks)**

c. Obtain the equation for voltage gain of common-source D-MOSFET amplifier. **(08 Marks)**

6 a. Explain the frequency response of a typical AC amplifier, mentioning the importance of cut-off frequency. **(08 Marks)**

b. Obtain the formula for decibel power gain and decibel voltage gain. **(04 Marks)**

c. For the circuit shown in Fig. Q6(c). Calculate :
i) The feedback fraction ii) The ideal cloud leep voltage gain iii) The exact-cloud leep voltage gain iv) The percentage error between ideal and exact valves of the closed leep voltage gain. Assume the open leep voltage gain of op. amp as 10^5. **(08 Marks)**

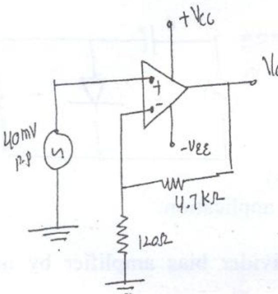

Fig. Q6(c)

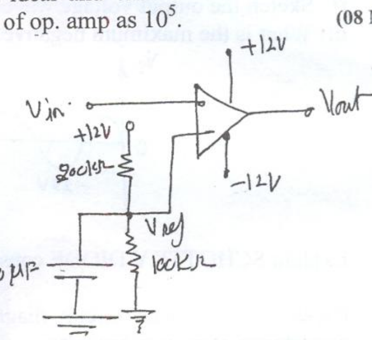

Fig. Q7(b)

7 a. Explain the functional block diagram, of 555 timers. **(08 Marks)**

b. The input voltage to the circuit shown in, Fig. Q7(b) is a sine wave of peak value 8V.
i) Calculate the trip point or threshold ii) Calculate the cut-off frequency of the bypass circuit iii) Sketch the output waveform and determine its duty circle. **(08 Marks)**

c. Explain how Schmitt trigger can be used to convert a periodic sine wave to a rectangular wave. **(04 Marks)**

8 a. Explain the various characteristics on which a power supply depends, with respect to quality and suitability : **(04 Marks)**

b. Calculate the output voltage for the circuit shown below in the Fig Q8(b) : **(08 Marks)**

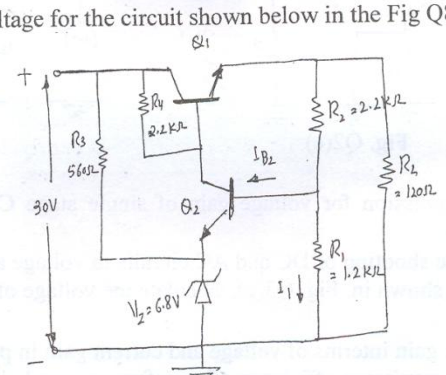

Fig. Q8(b)

c. Explain with a circuit diagram, unregulated DC to DC converter using power BJTs. **(08 Marks)**

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Third Semester B.E. Degree Examination, May/June 2010
Discrete Mathematical Structures

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions, selecting at least TWO questions from each part.***

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
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PART – A

1 a. Define power set of a set. Find the power sets of the following set : $A = \{0, \phi, \{\phi\}\}$. **(04 Marks)**

b. Using laws of set theory, prove that $(A \cap B) \cup [B \cap ((C \cap D) \cup (C \cap \overline{D}))] = B \cap (A \cup C)$. **(06 Marks)**

c. An integer is selected at random from 3 through 7 inclusive. If A is the event that a number divisible by 3 is chosen and B is the event that the number exceeds 10, determine $P_r(A)$, $P_r(B)$, $P_r(A \cap B)$ and $P_r(A \cup B)$ **(04 Marks)**

d. A professor has two dozen textbooks on computer science and is concerned about their coverage of topics : (A) compilers, (B) data structures, and (C) operating systems. Following are the numbers of books that contain material on these topics : $|A| = 8$, $|B| = 13$, $|C| = 13$, $|A \cap B| = 5$, $|A \cap C| = 3$, $|B \cap C| = 6$, $|A \cap B \cap C| = 2$.

i) How many of the textbooks include material on exactly one of these topics?

ii) How many do not deal with any of the topics? **(06 Marks)**

2 a. Define the following : i) Proposition ii) Tautology iii) Contradiction.

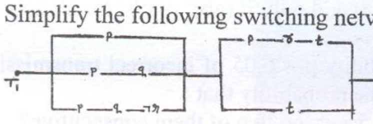
Determine whether the following compound statement is tautology or not :

$$[(p \to q) \land (q \to r)] \to (p \to r)$$ **(08 Marks)**

b. Using rules of inference, show that the following argument is valid : **(06 Marks)**

$$\begin{array}{l} p \\ p \to q \\ s \lor r \\ \underline{r \to \neg q} \\ \therefore s \lor t \end{array}$$

c. Simplify the following switching network, (without using the truth table). **(06 Marks)**



3 a. Establish the validity of the following argument: **(10 Marks)**

$$\begin{array}{l} \forall_x[p(x) \lor q(x)] \\ \exists_x \neg p(x) \\ \forall_x[\neg q(x) \lor r(x)] \\ \underline{\forall_x[s(x) \to \neg r(x)]} \\ \therefore \exists_x \neg s(x) \end{array}$$

b. For the following statements the universe comprises all nonzero integers. Determine the truth value of each statement : .

i) $\exists_x \exists_y [xy = 1]$ ii) $\exists_x \forall_y [xy = 1]$ iii) $\forall_x \exists_y [xy = 1]$ **(06 Marks)**

c. Negate and simplify each of the following : i) $\forall_x [p(x) \land \neg q(x)]$

ii) $\exists_x [p(x) \lor q(x)] \to r(x)$ **(04 Marks)**

4 a. Define the following : i) Well-ordering principle

ii) Principle of mathematical induction. **(04 Marks)**

b. By the principle of mathematical induction, prove that :

$$1^2 + 2^2 + 3^2 + \ldots\ldots + n^2 = \frac{n(n+1)(2n+1)}{6}$$ **(06 Marks)**

4 c. Give a recursive definition for each of the following integer sequence :
i) $c_n = 7n$ ii) $c_n = 2 - (-1)^n$. For $n \in z^+$. **(04 Marks)**

d. For $n \geq 0$ let F_n denote the n^{th} Fibonacci number. Prove that for any positive integer n, $\sum_{i=1}^{n} \frac{F_{i-1}}{2^i} = 1 - \frac{F_{n+2}}{2^n}$. **(06 Marks)**

PART – B

5 a. Define Cartesian product of two sets. For any three non-empty sets A, B, C. Prove that $A \times (B - C) = (A \times B) - (A \times C)$. **(05 Marks)**

b. Define the following : i) Function ; ii) Onto function ; iii) One – to – one. Let $f : z \to z$ be defined by $f(a) = a + 1$ for all $a \in z$. Find whether f is one-to-one correspondence or not. **(05 Marks)**

c. State the pigeonhole principle. Show that if any seven numbers from1 to 12 are chosen, then two of them will add to 13. **(05 Marks)**

d. Let $f, g : R \to R$ be defined by $f(x) = 2x + 5$, $g(x) = \left(\frac{1}{2}\right)(x - 5)$. Show that f and g are invertible. **(05 Marks)**

6 a. Let A = {1, 2, 3, 4}, Let R = {(1, 3), (1, 1), (3, 1), (1, 2), (3, 3), (4, 4)} be the relation on A. Determine whether the relation R is reflexive, irreflexive, symmetric, antisymmetric or transitive. **(05 Marks)**

b. Let A = {1, 2), B = {m, n, p} and C = {3, 4}. Let R_1 = {(1, m), {(1, n), {(1, p)}, R_2 = {(m, 3), (m, 4), (p, 4)} and R_3 = {(m, 3), (m, 4), (p, 3)}. Prove that :
$R_1 \circ (R_2 \cap R_3) \subseteq (R_1 \circ R_2) \cap (R_1 \circ R_3)$. **(05 Marks)**

c. Let A = {a, b, c}, B = P(A), where P(A) is the power set of A. Let R is a subset relation on A. Draw the Hasse diagram of the poset (B, R). **(05 Marks)**

d. Let A = {2, 3, 4, 6, 8, 12, 24} and let ≤ denotes the partial order of divisibility, that is x ≤ means x divides y. Let B = {4, 6, 12}. Determine :
i) All upper bounds of B ii) All lower bounds of B
iii) Least upper bound of B iv) Greatest lower bound of B. **(05 Marks)**

7 a. For any group G prove that G is abelian if and only if $(ab)^2 = a^2b^2$ for all a, b, ∈ G. **(05 Marks)**

b. State and prove Lagrange's theorem. **(05 Marks)**

c. A binary symmetric channel has probability p = 0.05 of incorrect transmission. If the word c = 011011101 is transmitted. What is the probability that :
i) Single error occurs, ii) Three errors occur, no two of them consecutive? **(05 Marks)**

d. Determine the minimum distance between the code words, $E : Z_2^3 \to Z_2^6$

$000 \to 000111$ $001 \to 001001$
$010 \to 010010$ $011 \to 011100$
$100 \to 100100$ $101 \to 101010$
$110 \to 110001$ $111 \to 111000$

How many errors can be detected and corrected by this code? **(05 Marks)**

8 a. Construct a decoding table (with syndromes) for the group code given by the generator matrix: $G = \begin{bmatrix} 1 & 0 & 1 & 1 & 0 \\ 0 & 1 & 0 & 1 & 1 \end{bmatrix}$. Using this decoding table, decode the following received words :
11110, 11011, 10000, 10101 **(10 Marks)**

b. Determine whether (z, ⊕,⊙) is a ring with the binary operations x ⊕ y = x + y – 7, x ⊙ y = x + y – 3xy for all x, y ∈ z. **(10 Marks)**

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USN | | | | | | | | | | 06CS35

Third Semester B.E. Degree Examination, May/June 2010
Data Structures with C

Time: 3 hrs. Max. Marks:100

Note: *Answer any FIVE full questions, selecting at least TWO questions from each part.*

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. 2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

PART – A

1 a. What is a pointer? What are the uses of pointers in C? **(05 Marks)**

b. Explain what is meant by lvalue and rvalue, with examples. **(05 Marks)**

c. Write a C program to read ten integers and store them in an array using pointers. Print their sum and average. **(10 Marks)**

2 a. What is a string? How is a string declared and initialized? **(05 Marks)**

b. Write appropriate structure definition and variable declarations to store following information about 100 students:

Name, USN, Gender, Date of birth and marks in three subjects S_1, S_2 & S_3.

Date of birth should be a structure containing fields day, month and year. **(05 Marks)**

c. Write a function that given a binary file, copies the odd items (item 1,3,5,…..n) to a second binary file and the even items(item, 2,4,6,8,….n+1) to a third binary file. **(10 Marks)**

3 a. Define stack. Briefly explain the primitive operations on the stack. **(05 Marks)**

b. Show using the tabular columns, how the expression (A+B)*C is converted into a postfix expression according to the infix to postfix conversion algorithm. **(05 Marks)**

c. Write the algorithm to evaluate a valid postfix expression and hence evaluate the postfix expression :

6 2 3 + – 3 8 2 / + *

All the operands are single digit positive integers and operators are binary in nature. **(10 Marks)**

4 a. Determine what the following recursive C function computes:

```
int func(int n)
{
  if (n = = 0)
     return(0);
  return(n + func(n – 1));
} /* end of func */
```

Write an iterative function to accomplish the same. **(05 Marks)**

b. Explain the working of a simple queue. **(05 Marks)**

c. Write a recursive function fact(n) to find the factorial of an integer. Diagrammatically explain, how the stacking and unstacking takes place during execution for fact(4). **(10 Marks)**

PART – B

5 a. What is a linear linked list? Write the algorithm to add an element to the front of the list. **(05 Marks)**

b. What are the advantages and disadvantages of representing a group of items as an array versus linear linked list? **(05 Marks)**

c. Write the following C routines for the dynamic implementation of a linked list. NODEPTR is of type pointer to a node.

i) void insertafter(NODEPTR p, int x) which inserts a node with information x after a node pointed to by p.

ii) void place(NODEPTR *plist, int x) which inserts a node with information x at a proper position within the linear linked list pointed to by *plist. The list is assumed to contain information in the increasing order. **(10 Marks)**

6 a. What is a circular list? Explain with a diagram. **(05 Marks)**

b. Compare linear linked list and doubly linked list, with diagrams. **(05 Marks)**

c. Give the C implementation of stack as circular list. **(10 Marks)**

7 a. With reference to the b-tree in Fig.Q7(a), give the three traversals **(05 Marks)**

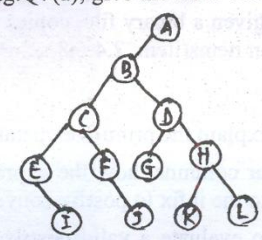

Fig.Q7(a)

b. i) Define strictly binary tree. Is the tree in Fig.Q7(a), a strictly b-tree.

ii) Define almost-complete b-tree. Is the tree in Fig.Q7(a), an almost complete b-tree. **(05 Marks)**

c. With reference to the dynamic node representation of b-tree, write the following C routines:

i) NODEPTR maketree(int x) which creates a node with information x.

ii) Void setleft(NODEPTR, int x) which sets a node with contents x as the left son of the node pointed to by p. **(10 Marks)**

8 a. With an example, show how a list can be represented as binary tree. **(05 Marks)**

b. Define the following terms with reference to general trees:
Father, son, brother, forest and ordered tree. **(05 Marks)**

c. Give the node structure of an expression tree. Explain how the expression is evaluated. **(10 Marks)**

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USN 1KS08CS038 **06CS36**

Third Semester B.E. Degree Examination, May/June 2010
UNIX and Shell Programming

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions, selecting at least TWO questions from each part.***

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

PART – A

1 a. Explain salient features of UNIX operating system. **(06 Marks)**
b. Explain the different types of files supported in UNIX. **(06 Marks)**
c. Explain the following commands, with example :
mailx, passwd, stty, who **(08 Marks)**

2 a. Briefly describe the different ways of setting file permissions. **(06 Marks)**
b. What are the three modes of vi editor? Explain. **(06 Marks)**
c. What is a navigation? What are commands used for navigation in vi editor? **(08 Marks)**

3 a. What are environmental variables? State their significance. **(06 Marks)**
b. What are three standard files used by UNIX commands? Explain. **(06 Marks)**
c. What is shell process? What are three different phases in the creation of process? **(08 Marks)**

4 a. What are hard links and symbolic links? **(06 Marks)**
b. Explain with an example, find command and its operators. **(06 Marks)**
c. Explain the following filters, with examples :
head, tail, cut, tr. **(08 Marks)**

PART – B

5 a. How to search for a pattern using grep? What are the options used by grep? **(08 Marks)**
b. Explain extended regular expression (ERE) set used by grep. **(06 Marks)**
c. What are internal commands used by sed? **(06 Marks)**

6 a. What are the special parameters used by the shell? **(06 Marks)**
b. Explain how numeric and string comparison is done by using test. **(06 Marks)**
c. Write a menu driven shell script to display list of files, process of user, todays date and users of the system. **(08 Marks)**

7 a. Explain any three built in variables used in awk. **(06 Marks)**
b. Give the syntax of three control flow statements used by awk. **(06 Marks)**
c. Explain built in functions used in awk. **(08 Marks)**

8 a. Explain string handling function in Perl. **(06 Marks)**
b. Explain split and join functions. **(06 Marks)**
c. Write a Perl script to convert a decimal number to binary. **(08 Marks)**

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