

I B.Tech Supplementary Examinations, Aug/Sep 2007**INTRODUCTION TO COMPUTERS**

(Common to Civil Engineering, Mechanical Engineering, Chemical Engineering, Mechatronics, Metallurgy & Material Technology, Production Engineering, Aeronautical Engineering and Automobile Engineering)

Time: 3 hours**Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

1. (a) What are the capabilities of computer?
 (b) Explain the working principle of associate memory.
 (c) Distinguish between machine language and high level language [6+64]
2. (a) Define operating system.
 (b) Enumerate various types of operating systems.
 (c) Write the following decimal numbers into 8 bit sign-magnitude form and 8 bit 2's complement form. [2+6+8]
 - i. 87
 - ii. -123
3. (a) Explain bit-wise operators with examples.
 (b) Write a C program to read a number and print the number in words.(eg:123=One Two Three). [6+10]
4. (a) What is a pointer? Mention the advantages of pointers.
 (b) Distinguish between address operator and dereferencing operator.
 (c) Can you pass pointers to functions? If yes, explain with suitable example.
 (d) Write a C program to find the desired element in an array of N elements. Use pointers to search an element. [4+2+5+5]
5. (a) Write an algorithm for Bisection method.
 (b) Evaluate $\sqrt{12}$ to 4 decimal places by Newton Raphson method. [8+8]
6. (a) Solve the following system of equation by Gaussian Elimination method.
 $10X+Y+Z=18.141,$
 $X+Y+10Z=38.139,$
 $X+10Y+Z=28.140.$
 (b) Write an algorithm for Gaussian Elimination method. [8+8]
7. (a) Given the following table find approximately the value of y-0.5.

x:	0	1	2	3	4	5
y:	27	32	25	36	32	41

 Using Newton's forward difference formula.

(b) Fit a straight line for the following data. [8+8]

x:	1	2	3	4	5
y:	3	4	5	6	8

8. (a) Evaluate $\int_0^5 e^{-x^2} dx$ using Trapezoidal rule.

(b) Solve, by Euler's modified method, the equation $\frac{dy}{dx} = x + y, y(0) = 0$
Choose $h=0.2$ and compute $y(-2)$ $y(0.4)$ and $y(0.6)$ and $y(0.8)$. [8+8]

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1. (a) Draw and explain functional block diagram of a computer.
(b) Explain the working principle of CRT monitor. [8+8]
2. (a) What is multitasking operating system? Give an example.
(b) Give the range of integers that can be represented in 16 bit 2's complement form.
(c) Convert the following into decimal. [4+4+8]
 - i. $9C2.FC_{16}$
 - ii. $234.AC_{16}$
3. (a) How the name C is derived? List salient features of C language?
(b) Write the basic structure of C language and explain.
(c) How to compile and execute a C program in DOS platform? [7+6+3]
4. Explain the following string handling functions with an example for each.
 - (a) `strupr ()`
 - (b) `strcpy()`
 - (c) `strncmp()`
 - (d) `strcat()` [16]
5. (a) Write an algorithm for Regular - Falsi method.
(b) Use the Iteration method to find a root of the equation $x = \frac{1}{2} + \sin x$. [8+8]
6. (a) Solve the system of equations using Gauss-Seidal method.

$$10X_1 - 2X_2 - X_3 - X_4 = 3$$

$$-2X_1 + 10X_2 - X_3 - X_4 = 15$$

$$-X_1 - X_2 + 10X_3 - 2X_4 = 27$$

$$-X_1 - X_2 - 2X_3 + 10X_4 = -9.$$

(b) Write an algorithm for Gauss - Jordan method. [8+8]
7. (a) Derive the formula to estimate the polynomial of degree n using Lagrange interpolation method.

- (b) Find the 3rd polynomial to fit the following points: [7+9]

i	1	0	1	3
F(X)	6	2	2	10

Using Newton's forward formula.

8. (a) Write an algorithm for the evaluation of integral by trapezoidal rule.
- (b) Solve the following differential equations by Runge-Kutta fourth order method $\frac{dy}{dx} = 2xy, y(0) = 0.5, h = 0.5$ solution for $1 \geq x \geq 0$ [8+8]

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1. (a) Describe various components of a computer.
(b) Explain working principle of magnetic disk. [8+8]

2. (a) What is real time operating system? Give an example.
(b) Distinguish between multitasking and multiprocessor operating systems.
(c) Convert the following numbers into octal. [4+4+8]
 - i. $7F9C.1C_{16}$
 - ii. $87BC.A1_{16}$

3. (a) What is an entry-controlled loop? Explain any entry controlled loop with a suitable example.
(b) write a program to display the floyd's triangle for n lines. [6+10]

```

1
2   3
4   5   6
7   8   9   10
.....(n lines)

```

4. (a) Describe parameter-passing mechanisms with examples.
(b) Distinguish between: [8+8]
 - i. Arguments and parameters
 - ii. Local and Global variables

5. (a) Write an algorithm for Newton Raphson method.
(b) Find a real root of $3x - \cos x - 1 = 0$ by bisection method. [8+8]

6. (a) Solve the following system of equation by Gaussian Elimination method.

$$X_1 - X_2 + X_3 = 1,$$

$$-3X_1 + 2X_2 - 3X_3 = 6,$$

$$2X_1 - 5X_2 + 4X_3 = 5.$$

(b) Write an algorithm for Gaussian Elimination method. [8+8]

7. (a) Derive normal equations to fit the straight line $y = a + b \cdot x$.

(b) Given the table of points use least squares regression to fit a straight line.

[6+10]

X	0	2	4	6	8	12	16	20
Y	10	12	18	22	20	30	26	30

8. (a) Evaluate $\int_2^2 \frac{dx}{x}$ using Trapezoidal rule taking $h = 0.1$.

(b) Compare Runge-Kutta and Prediction correction method.

[8+8]

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1. (a) What is a microprocessor? Give some examples?
(b) Distinguish between the following:
 - i. Line printer and Laser printer
 - ii. Floppy disk and Hard disk
 - iii. Address bus and Control bus [4+12]

2. (a) What is real time operating system? Give an example.
(b) Distinguish between multitasking and multiprocessor operating systems.
(c) Convert the following numbers into octal. [4+4+8]
 - i. $7F9C.1C_{16}$
 - ii. $87BC.A1_{16}$

3. (a) Differentiate between:
 - i. Algorithm and Flowchart
 - ii. Syntax error and Logical error.
 (b) Write an algorithm to generate prime numbers between the two given limits. [8+8]

4. (a) Explain call by value and call by reference with examples.
(b) Write a C program to replace a particular word by another word in a given string. [6+10]

5. (a) Write an algorithm for False Position method.
(b) Find the smallest positive root by Newton Raphson method for $\sin x - \cosh x + 1 = 0$. [8+8]

6. (a) Solve the system of equations using Gauss-Seidal method.

$$10X_1 - 2X_2 - X_3 - X_4 = 3$$

$$-2X_1 + 10X_2 - X_3 - X_4 = 15$$

$$-X_1 - X_2 + 10X_3 - 2X_4 = 27$$

$$-X_1 - X_2 - 2X_3 + 10X_4 = -9.$$
 (b) Write an algorithm for Gauss - Jordan method. [8+8]

7. (a) Explain the difference between the forward difference table and backward difference table?

(b) Construct difference table for the following data: [6+10]

x	0.1	0.3	0.5	0.7	0.9	1.1	1.3
F(x)	0.003	0.067	0.148	0.248	0.370	0.518	0.697

And find $F(0.6)$ using a cube that fits at $x=0.3, 0.5, 0.7$ and 0.9 using Newton's forward formula.

8. (a) Write an algorithm for implementing trapezoidal rule.

(b) A rocket is launched from the ground. Its acceleration measured every 5 seconds is tabulated below. Find the velocity and the position of the rocket at $t=40$ seconds. Use trapezoidal rule. [8+8]

t	0	5	10	15	20	25	30	35	40
a(t)	40.0	45.25	48.50	51.25	54.35	59.48	61.5	64.3	68.7
