

[This question paper contains 4 printed pages.]

Sr. No. of Question Paper : 1806 C Roll No.....

Unique Paper Code : 251402

Name of the Course : B.Sc. (H) Electronics

Name of the Paper : Electronics Practical – VII : ELHP-405

Semester : IV

Duration : 1 Hour Maximum Marks : 25

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt any **five** questions from Section A and **ten** questions from Section-B.
3. Use of non-programmable scientific calculator is allowed.

SECTION – A

1. Find the absolute and relative error if $5/3$ is approximated to 1.667.
2. What is the advantage of iterative method (trial and error method) over a direct method ?
3. Why Euler method of solving first order ordinary differential equation has limited usage ?
4. Give the formula of second order Runge-Kutta method to solve first order ordinary differential equation.
5. Mention the advantages of representing stack by using linked lists rather than by arrays.

P.T.O.

6. What are priority queues ?

7. What is a complete binary tree ?

(1×5=5)

SECTION – B

1. Perform four iterations of Bisection method to find the root of

$$x^3 - 9x + 1 = 0$$

where root lies between 2 and 3.

2. Discuss the convergence and limitations of Newton Raphson method to solve a nonlinear equation.

3. Compare Regula Falsi and Secant methods for solving $f(x) = 0$.

4. Construct a backward difference table for the following data

X	1	2	3	4	5
F(x)	4	13	34	73	136

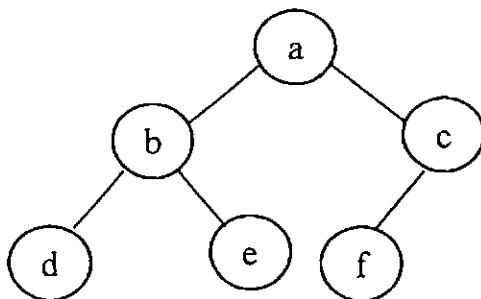
5. Write the formula for evaluating the definite integral $\int_a^b y(x)dx$ using Trapezoidal rule. Why it is called so ?

6. Explain how you will reduce the problem of fitting a curve of the form $y = ae^{bx}$ to a given set of data points to the problem of linear regression.

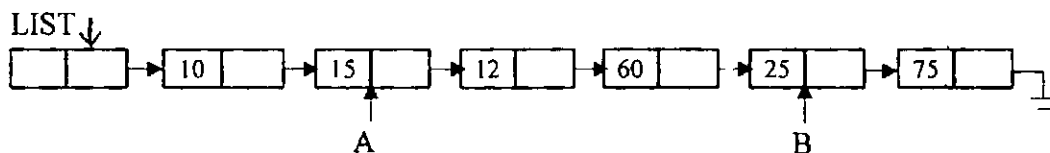
7. Give a datastructure based on LIFO and FIFO principle each.

8. Why searching a node in a binary search tree is efficient than that of a simple binary tree ?

9. Give preorder traversal of the following tree.



10. Use the linked list shown in figure below and answer the following. Here each node consists of INFO – data stored in the node and LINK - the pointer pointing to the next node



- (a) What is the result of $A \rightarrow \text{LINK} \rightarrow \text{INFO}$?
- (b) What is the result of $\text{LIST} \rightarrow \text{LINK} \rightarrow \text{INFO} + A \rightarrow \text{INFO}$?
- (c) What is the result of $B \rightarrow \text{LINK} \rightarrow \text{LINK}$?
- (d) What is the result of execution of $A = A \rightarrow \text{LINK} \rightarrow \text{LINK}$?
11. Consider the following stack of characters implemented as an array of 5 elements

STACK : BKQM
 ↓
 TOP

Describe the stack as the following sequence of operations take place

POP (STACK, ITEM)

PUSH(STACK, N)

PUSH(STACK, T)

PUSH(STACK, S)

12. Convert the expression $((A+B)*C-(D-E)^{(F+G)})$ to equivalent prefix notation.
13. The following array of integers is to be arranged in ascending order using bubble sort technique

26 21 20 23 17

Give the content of the array at the end of each iteration. (Do not write the algorithm or program) (2×10=20)