[Time: 2½ Hours]   **[Marks:75]**

N.B: 1. **All** questions are **compulsory**.
2. Make **suitable assumptions** wherever necessary and **state the assumptions** made.
3. Answers to the **same question** must be **written together**.
4. Numbers to the **right** indicate **marks**.
5. Draw **neat labeled diagrams** wherever **necessary.**
6. Use of **Non-programmable** calculators is **allowed**

1. Attempt any three of the following:

a. What is the difference between machine level language and high level language?

b. Describe the structure of a C program.

c. List and explain five desirable program characteristics.

d. Explain the following with example .
   i).Symbolic Constants
   ii). Escape Sequences

e. Draw a flowchart to find the largest of three numbers.

f. Determine if the following constants are valid in C
   i)   27.822
   ii)   0.8E 8
   iii)   "Name:
   iv)   "1.3e-12"
   v)   0xBCFDAL

2. Attempt any three of the following:

a. Write a program in C to finds the roots of a quadration Equation.

b. Explain the conditional operator and assignment operators in C with example.

c. Interpret the C statements
   i)   scanf("%8d %*d %121f %121f", &a,&b,&c,&d);
   ii)   scanf("%c %c %c", &a,&b,&c);
   iii) scanf("%d %d %f %f", &a,&b,&c,&d);

d. Write a program in C to solve the following expression $F = P(1+i)^n$.

e. What is the relational expression? List all operators used with it.

f. Explain gets and printf statements used in C programming language.

3. Attempt any three of the following:

a. Write the syntaxof the if-statement in C. What are nested ' if ' statement?

b. Write a program in C to find the sum of the series $Y = 1^2 + 2^2 + 3^2 + 4^2 + 5^2 +....+ n^2$ using a while loop.

c. What is the difference between while and do-while statements in C.

d. Write a function in C to swap teo integer variable using call by value and call by reference .

e. Explain the switch …case statement in C with an example .

f. Explain the following with respect to function in C
   i)   Function prototype.
   ii)   Formal arguments
   iii) Return expression

4. Attempt any three of the following:

a. Explain the meaning of following keywords in C.
   - i) Auto
   - ii) Register
   - iii) static

b. Write the use of #define directive. Also give suitable examples.

c. What is a macro ? Write a program in C to find the area of a rectangle and square using macros.

d. What is a array? How can a single dimensional array be initialized ?

e. Write a program in C to check whether a number is stroed in an array of ten integers .
   If present display its position else display appropriate error message.

f. Explain strlen, strcat, strcmp functions with example.

5. Attempt any three of the following:

a. Explain
   - i) Pointer declaration.
   - ii) ' * ' and ' & ' operators used with pointers

b. Can structure variable be passed to function as an argument? Justify.

c. Write a program in C to display the cube of ten elements of an integer array using pointers

d. Explain the statements of the main( ) function with its output

```
#include<stdio.h>
void main()
{ int line[80];
int *p1;
line[2] = line[1];
line[2] = *(line+1);
*(line+3)= line[1]+3;
*(line+2)= *(line+1);
p1= &line[1];
p1=line+1;
}
```

e. Explain nested structure in C with example.

f. How array can be used in structure? Explain array of structure variables.

_____