Time: 3 Hours   **Marks: 80**

N.B
   (1) Question no. 1 is compulsory.
   (2) Attempt any 3 from the remaining questions.
   (3) Assume suitable data if necessary.
   (4) Figures to right indicate full marks.

Q.1 a. Attempt multiple choice questions.   **10**
   i. Which of the following is valid variable name?
     (a) case   (b) int_rate2   (c) 2sum   (d) for

   ii. The operator -- is a
     (a)Unary operator (b) Binary operator (c) Ternary operator (d)Conditional operator

   iii. Control automatically passes to the beginning of loop by using
       (a) break statement (b) goto statement (c) continue statement (d) none of these

   iv. '&' is a ----------- operator.
       (a) Unary operator (b) Value operator (c) Address operator (d) none of these

   v. do.........while is _____ control loop.
       (a) exit   (b)entry   (c) count   (d)all of these

   vi. Which is the correct way to declare a pointer?
       (a) int *ptr   (b) int ptr*   (c) * int ptr   (d) none of these

   vii. Which of the following belongs to derived data type.
       (a) structures   (b)union   (c)pointers   (d) all of the above

   viii. Which function used to write a character to a file
       (a)fputc()   (b)fgetc()   (c) fputs()   (d)fwrite()

   ix. Each case statement in switch () is separated by
       (a) break   (b) continue   (c) goto   (d) none of these

   x. Which of the following #define statement is valid?
       (a) #define x=10   (b) #define x 10;   (c) #define x 10   (d) # Define x 10

   b. a. Convert the mathematical expression into equivalent C expression   **03**
       i.
       $$a = \frac{xy + z\left(\frac{x}{y}\right) + zy}{x + y + z}$$
       ii.
       $$r = \frac{2v + 6.22(c + d)}{g + v} + \frac{3}{c/d}$$
       iii.
       $a = x^{y^z}$ [hint: use function from math library]

68417   **Page 1 of 2**

c. If x ,y and z are int variable then evaluate the following expression and give final value of x,y ,z and p.   **02**

x =10, y =6, z=8

i.   p = x-- +y--+--z/(x*x)
ii.   p = --x + ++y *z--;

d. Compare structure and union with proper example.   **02**
e. Explain pointers with example. How array is related with pointers?   **03**

Q.2 a. What is function? What do mean by calling function and called function? What are function parameters? Using return statement can we return multiple values to calling function? If no then what solution is available? Explain with example.   **12**

b. Explain break and continue statements with suitable example.   **08**

Q.3 a. WAP to sort the array in ascending order.   **10**
b. WAP to accept a string and count no. of vowels and consonants, spaces, digits and special characters in it.   **06**
c. WAP to find maximum of three numbers using conditional operator.   **04**

Q.4 a. Create a structure Patient having ID, patient_name and disease_name as data members. WAP to read details of 10 patients and print details of those patients having 'diabetes'.   **12**

b. What is a file? What are different types of files? Explain the following file handling functions in c.   **08**
i) fopen ()   ii) fprintf ()   iii) fscanf ()   iv) fgets() v)fputs() vi) fclose()

Q.5 a. WAP to check whether entered matrix is symmetric or not.   **10**
b. Explain difference between auto and static storage class with suitable example.   **05**

c. WAP to print a pattern   **05**

```
      *
    *   *
  *   *   *
*   *   *   *
```

Q.6 a. What is recursion? How it is different from iteration? WAP to compute factorial of a number using recursion.   **12**
b. WAP to print Fibonacci series upto n. [Note: n entered by user, use iterative stmt]   **08**

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68417   **Page 2 of 2**