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Question Paper Code : 81153

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2025.

Second Semester

Computer Science and Engineering

CS 3251 – PROGRAMMING IN C

(Common to Computer Science and Engineering (Artificial Intelligence and Machine Learning)/Computer Science and Engineering (Cyber Security)/Computer and Communication Engineering/
Information Technology)

(Regulations 2021)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Write the program snippet to print first 10 odd numbers using while loop and 'for' statement.
2. Provide the name of any four preprocessor directives.
3. Find the output of the following code snippet.

```
#include<stdio.h>
```

```
int main ()
```

```
{
```

```
int arr[8];
```

```
int n=0;
```

```
while (n<8)
```

```
{
```

```
arr[n] = ++n;
```

```
}
```

```
}
```

4. Write any two string handling functions in C with their syntax and purpose.

5. Predict the output:

```
#include <stdio.h>

int main()
{
    int a=10, b = 20, *p,s = 0;

    p = &a;

    a++;

    *p++;

    s=a+b*p;

    printf("%d\n",s);

    return 0;
}
```

6. Give the declaration syntax of passing function to other functions.
7. Differentiate 'Structure' and 'Union'.
8. Give an example for static variable usage in a scope.
9. When to use fread() and fwrite() functions in file processing?
10. Mention any two functions used in Random access files and specify their use in C programming.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Enlist the operators in C language and their precedence rule. Determine the value of each of the following arithmetic expressions. Assume a = 5, b = 3, and c = -8. (4+3+3)
- (1) $S = (a+b)/c \% d - a+b * (a/b)$
- (2) $a==b \ \&\& \ a<c$
- (ii) Distinguish between Keywords and Identifiers with proper examples for each. (6)

Or

- (b) (i) Find the output of the following C code. Discuss the steps of execution. (6)

```
main ( )  
{  
    int t = 2, j = 3, k, p;  
    float a, b;  
    k = t / j * j;  
    I = j / t * t;  
    a = t / j * j;  
    b = j / t * t;  
    printf("%d %d %f %f", k, p, a, b);  
}
```

- (ii) Illustrate the following with suitable examples. (5+5)

- (1) Replace if-else statement with conditional operator.
- (2) Break and Continue statements.

12. (a) (i) Consider an 1D array with characters, write a C program to display the maximum occurred character. (6)
- (ii) Write a C program to- create two matrices (2D arrays) with integer values and print all the values which are present in second matrix but not in first matrix. (10)

Or

- (b) (i) Write the pseudocode to implement binary search technique. (6)
- (ii) Write a C program to implement the following using string functions:

- (1) Get a main-string and sub-string, print the number of occurrences of sub-string in the main-string. (5)
- (2) Get an input string, convert characters at odd position into upper case and characters at even position into lower case. (5)

13. (a) (i) Illustrate the difference between 'Pointer to an array' and 'Array of pointers'. (6)
- (ii) Write a C program to find grade of 'n' students by calculating total marks using arrays passed to a function. (10)

Or

- (b) (i) Write a program to count the number of positions in two matrices which are having same elements. Use pointers and functions. (10)
- (ii) Differentiate call-by-value and call-by-reference with appropriate examples. (6)

14. (a) (i) Give an example for the following: (4+5)
(1) Nested structure
(2) Self-referential structure
(ii) Explain insertion at middle and deletion at beginning of a Singly linked list. (7)

Or

- (b) Create a structure to store the information about the dress materials such as dress code, dress-gender, dress-size, dress-category and dress-price. A family is purchasing dress materials for the family members. Write a C program to generate a bill calculated using the following conditions:
(i) If any dress is purchased for girls less than 10 years, give 5% discount on the total bill (8)
(ii) If any dress is purchased for boys less than 5 years, give 3% discount on the total bill. (8)
Use Typedef and pointer concepts.
15. (a) (i) Provide an example for the usage of Command line arguments. (6)
(ii) In Amazon, customers are trying to register themselves. Write a C program to get registration details as name, gender, occupation, and age as structure in a file. Create another file to store the customers who are rejected for registration when they are below 20 years of age. (10)

Or

- (b) (i) Write a program in C to create a file named 'trains.txt' with information about the trains passing through Bangalore Junction. Do the following using the files operating commands.
(1) Add a new train details to 'trains.txt' (5)
(2) Delete all the trains that are having the destination 'Chennai'. (5)
(ii) List down the modes in which a C file can be opened. Specify the purpose of each mode. (6)