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**MJC45CSC101(T)25**

**1st Semester Exam., 2025 (Nov) (FYUP)**

**MAJOR-1 (COMPUTER SCIENCE)**

**[ Programming using C ]**

*Full Marks : 70*

*Pass Marks : 28*

*Time : 3 hours*

*The figures in the margin indicate full marks  
for the questions.*

**PART—A**

Choose the correct answer and rewrite them :

1×10=10

1. What is the purpose of a linker in the compilation process?
  - (a) To translate code to machine code
  - (b) To link object files and libraries
  - (c) To optimize code
  - (d) To debug code

26Q/554

( Turn Over )

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2. Find the output of

```
int x = 5;
printf ("%d", sizeof (x++));
```

- (a) 4
- (b) 5
- (c) 6
- (d) 0

3. What is the syntax of a 'for' loop in C?

- (a) for (init; condition; increment)
- (b) for (init; increment; condition)
- (c) for (condition; init; increment)
- (d) for (increment; condition; init)

4. Continue statement in C is

- (a) to restart a loop
- (b) to exit a loop
- (c) to skip to the next iteration of a loop
- (d) to declare a variable

26Q/554

( Continued )

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5. What is the difference between Call by Value and Call by Reference?

- (a) Call by Value passes the address, Call by Reference passes the value
- (b) Call by Value passes the value, Call by Reference passes the address
- (c) Call by Value is faster, Call by Reference is slower
- (d) Call by Value is slower, Call by Reference is faster

6. Match the following and select the correct answer using the codes given below :

- |                |  |
|----------------|--|
| A. malloc ( )  | 1. Allocates memory and initializes to zero  |
| B. calloc ( )  | 2. Changes the size of allocated memory      |
| C. realloc ( ) | 3. Allocates memory                          |
| D. free ( )    | 4. Free allocated memory                     |
|                | 5. Returns a pointer to the allocated memory |

Codes :

- |     |   |   |   |   |
|-----|---|---|---|---|
| (a) | A | B | C | D |
|     | 3 | 1 | 2 | 4 |
| (b) | A | B | C | D |
|     | 1 | 2 | 4 | 3 |
| (c) | A | B | C | D |
|     | 5 | 1 | 2 | 4 |
| (d) | A | B | C | D |
|     | 2 | 3 | 1 | 5 |

26Q/554

( Turn Over )

7. Choose the correct statements :

1. `sizeof()` is a function in C.
2. Pointers in C can be used to implement link list.
3. Union in C are used to save memory.
4. Structure in C cannot be nested.
5. `realloc()` is used to change size of allocated memory.

- (a) 1 and 2 only  
(b) 2 and 3 only  
(c) 3 and 4 only  
(d) 1, 2, 3 and 5

8. Arrange the following :

1. Linking object
2. Preprocessing source code
3. Generating executable
4. Compiling source code

- (a) 2 → 4 → 1 → 3  
(b) 1 → 2 → 3 → 4  
(c) 4 → 1 → 2 → 3  
(d) 3 → 2 → 4 → 1

9. Assertion (A) :

Binary files are generally smaller than text files for numerical data.

Reason (R) :

Binary files store data in compact human readable characters.

- (a) Both A and R are true, and R explains A  
(b) Both A and R are true, but R does not explain A  
(c) A is true, but R is false  
(d) A is false, but R is true

10. Assertion (A) :

The volatile keyword in C prevents compiler optimizations on a variable.

Reason (R) :

Static variables are allocated in data segment, not on stack.

- (a) Both A and R are true, and R explains A  
(b) Both A and R are true, but R does not explain A  
(c) A is true, but R is false  
(d) A is false, but R is true

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PART—B

Answer **all** the following questions in approximately  
30-40 words : 2×5=10

11. What are bitwise operators? Give example.
12. What happens if you forget to increment the loop counter in a 'for' loop?
13. How does user-defined function differ from library function in C?
14. What does malloc() return in C?

Or

How do you access a structure member using a pointer?

15. What does strlen() return to  
"FIRST \0 SEMESTERNEP2025"?

Or

How does gets() differ from fgets()?

PART—C

Answer **all** the following questions in around  
80-100 words : 5×6=30

16. What is an algorithm? Explain the steps involved in designing an algorithm.

26Q/554

( Continued )

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Or

Describe the different types of operators in C with examples.

17. Explain the working of nested loops in C with an example.

Or

Write a C program to check if a number is prime or not using a 'for' loop.

18. Explain function prototyping in C with example.

Or

Explain the output of the following C code :

```
#include <stdio.h>
void fun()
{
    static int x=0;
    printf("%d", x++);
}
int main()
{
    fun();
    fun();
    fun();
    return 0;
}
```

5Q/554

( Turn Over )

19. How do you pass a 2D array to a function in C?

Or

Explain structure and unions in C with examples.

20. Read the text carefully and write the answer to the questions from the text that follow :

Array in C can be one-dimensional, two-dimensional or multidimensional. Pointers store memory addresses and support arithmetic operation. Dynamic memory allocation functions like malloc(), calloc() and free() manage memory at runtime. Pointers are used with arrays, structures, and functions. Structures and unions are derived data type that group different data types.

Questions :

- (a) What is pointer arithmetic? 2
- (b) How do you declare a pointer to a pointer? 2
- (c) What is two-dimensional array in C? 1

21. Read the text carefully and write the answer to the questions from the text that follow :

Strings in C are array of characters terminated by a null character(\0) C provide various string manipulation functions like strcpy(), strcat() and strcmp(). Files can be text or binary and C provides functions like fopen(), fclose(), fread() and fwrite() for file I/O. File positioning functions like fseek() and ftell() help navigate files.

Questions :

- (a) How do fread() and fwrite() work with binary files? 3
- (b) What does fseek() do? 2

PART—D

Answer all the following questions within 180-200 words : 10×2=20

22. Discuss file positioning functions in C.

Or

Describe how to use fscanf() and fprintf() for formatted file I/O in C.

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23. Discuss how structure programming using user-defined function improves code organization and readability.

*Or*

Write a recursive C function using a static variable to print the Fibonacci series up to  $n$  terms. Explain.

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