

A3-R4: PROGRAMMING & PROBLEM SOLVING THROUGH 'C' LANGUAGE

अवधि: 03 घंटे
DURATION: 03 Hours

अधिकतम अंक: 100
MAXIMUM MARKS: 100

ओएमआर शीट सं.:
OMR Sheet No.:

रोल नं.:
Roll No.:

उत्तर-पुस्तिका सं.:
Answer Sheet No.:

परीक्षार्थी का नाम: _____; परीक्षार्थी के हस्ताक्षर: _____
Name of Candidate: _____; Signature of candidate: _____

परीक्षार्थियों के लिए निर्देश:

Instructions for Candidate:

कृपया प्रश्न-पुस्तिका, ओएमआर शीट एवं उत्तर-पुस्तिका में दिये गए निर्देशों को ध्यान पूर्वक पढ़ें।	Carefully read the instructions given on Question Paper, OMR Sheet and Answer Sheet.
प्रश्न-पुस्तिका की भाषा अंग्रेजी है। परीक्षार्थी केवल अंग्रेजी भाषा में ही उत्तर कर सकता है।	Question Paper is in English language. Candidate can answer in English language only.
इस मॉड्यूल/पेपर के दो भाग हैं। भाग एक में चार प्रश्न और भाग दो में पाँच प्रश्न हैं।	There are TWO PARTS in this Module/Paper. PART ONE contains FOUR questions and PART TWO contains FIVE questions.
भाग एक "वैकल्पिक" प्रकार का है जिसके कुल अंक 40 हैं तथा भाग दो, "व्यक्तिपरक" प्रकार है और इसके कुल अंक 60 हैं।	PART ONE is Objective type and carries 40 Marks. PART TWO is subjective type and carries 60 Marks.
भाग एक के उत्तर, इस प्रश्न-पत्र के साथ दी गई ओएमआर उत्तर-पुस्तिका पर, उसमें दिये गए अनुदेशों के अनुसार ही दिये जाने हैं। भाग दो की उत्तर-पुस्तिका में भाग एक के उत्तर नहीं दिये जाने चाहिए।	PART ONE is to be answered in the OMR ANSWER SHEET only, supplied with the question paper, as per the instructions contained therein. PART ONE is NOT to be answered in the answer book for PART TWO .
भाग एक के लिए अधिकतम समय सीमा एक घण्टा निर्धारित की गई है। भाग दो की उत्तर-पुस्तिका, भाग एक की उत्तर-पुस्तिका जमा कराने के पश्चात दी जाएगी। तथापि, निर्धारित एक घंटे से पहले भाग एक पूरा करने वाले परीक्षार्थी भाग एक की उत्तर-पुस्तिका निरीक्षक को सौंपने के तुरंत बाद, भाग दो की उत्तर-पुस्तिका ले सकते हैं।	Maximum time allotted for PART ONE is ONE HOUR . Answer book for PART TWO will be supplied at the table when the answer sheet for PART ONE is returned. However, candidates who complete PART ONE earlier than one hour, can collect the answer book for PART TWO immediately after handing over the answer sheet for PART ONE .
परीक्षार्थी, उपस्थिति-पत्रिका पर हस्ताक्षर किए बिना अथवा अपनी उत्तर-पुस्तिका, निरीक्षक को सौंपे बिना, परीक्षा हाल नहीं छोड़ सकता है। ऐसा नहीं करने पर, परीक्षार्थी को इस मॉड्यूल/पेपर में अयोग्य घोषित कर दिया जाएगा।	Candidate cannot leave the examination hall/room without signing on the attendance sheet or handing over his Answer sheet to the invigilator. Failing in doing so, will amount to disqualification of Candidate in this Module/Paper.
प्रश्न-पुस्तिका को खोलने के निर्देश मिलने के पश्चात एवं उत्तर देने से पहले उम्मीदवार यह जाँच कर यह सुनिश्चित कर ले कि प्रश्न-पुस्तिका प्रत्येक दृष्टि से संपूर्ण है।	After receiving the instruction to open the booklet and before answering the questions, the candidate should ensure that the Question booklet is complete in all respect.

जब तक आपसे कहा न जाए तब तक प्रश्न-पुस्तिका न खोलें।

DO NOT OPEN THE QUESTION BOOKLET UNTIL YOU ARE TOLD TO DO SO.

PART ONE
(Answer all the questions)

1. Each question below gives a multiple choice of answers. Choose the most appropriate one and enter in the "OMR" answer sheet supplied with the question paper, following instructions therein. (1x10)

1.1 How many times below for loop will be executed?

```
#include<stdio.h>
int main()
{
    int i=0;
    for(;;)
        printf("%d",i);
    return 0;
}
```

- A) 0 times
- B) Infinite times
- C) 10 times
- D) 1 times

1.2 Find output of the following program?

```
#include<stdio.h>
int main()
{
    char str[] = "Smaller";
    int a = 100;
    printf(a > 10 ? "Greater" : "%s", str);
    return 0;
}
```

- A) Greater
- B) Smaller
- C) Compile Error
- D) 100

1.3 Which of the following cannot be checked in a switch-case statement?

- A) Character
- B) Integer
- C) Float
- D) enum

1.4 Difference between calloc() and malloc() is:

- A) calloc() takes a single argument while malloc() needs two arguments
- B) malloc() takes a single argument while calloc() needs two arguments
- C) malloc() initializes the allocated memory to ZERO
- D) calloc() initializes the allocated memory to NULL

1.5 What is the purpose of getc()?

- A) read a character from STDIN
- B) read a character from a file
- C) read all file
- D) read file randomly

- 1.6 Difference between structure and union is
 - A) We can define functions within structures but not within a union
 - B) We can define functions within union but not within a structure
 - C) The way memory is allocated
 - D) There is no difference

1.7 What is correct order of precedence in C?

- A) Addition, Division, Modulus
- B) Addition, Modulus, Division
- C) Multiplication, Substraction, Modulus
- D) Modulus, Multiplication, Substraction

1.8 Disadvantage of array in C is

- A) We can easily access each element
- B) It is necessary to declare too many variables
- C) It can store only one similar type of data
- D) It is difficult to perform sorting operation on it

1.9 Which is invalid name of identifier?

- A) world
- B) addition23
- C) test-name
- D) factorial

1.10 Due to variable scope in C

- A) Variables created in a function cannot be used another function
- B) Variables created in a function can be used in another function
- C) Variables created in a function can only be used in the main function
- D) None of the above

2. Each statement below is either TRUE or FALSE. Choose the most appropriate one and enter your choice in the "OMR" answer sheet supplied with the question paper, following instructions therein. (1x10)

- 2.1 Functions cannot return more than one value at a time.
- 2.2 Functions can be called either by value or reference.
- 2.3 Does the data type of all elements in the union will be same?
- 2.4 We can allocate a 2-Dimensional array dynamically.
- 2.5 The function free() is used to release dynamically allocated memory back to the heap for possible reuse.
- 2.6 If p is a pointer then the expression p = p + 1; adds 1 to the value of p regardless of p's type.
- 2.7 The string "Bilbo Baggins", may be stored in an array of 13 characters.
- 2.8 typedef is used to give a new name to a known data type.
- 2.9 The lifetime of a static variable is the duration of your program's execution.
- 2.10 Are the three declarations char **apple, char *apple[], and char apple[][] same?

3. Match words and phrases in column X with the closest related meaning/ word(s)/phrase(s) in column Y. Enter your selection in the “OMR” answer sheet supplied with the question paper, following instructions therein. (1x10)

X		Y	
3.1	Identifiers	A.	Used to terminate loops or to exit from switch
3.2	String constant	B.	Used to bypass the remainder of the current pass through a loop
3.3	getchar()	C.	Accepts an argument which is an array of pointers to characters
3.4	rand()	D.	Accepts an argument which is a pointer to a character.
3.5	putchar()	E.	Does not retain its value once control is transferred out of its defining function
3.6	break()	F.	Allows user to define new data-types that are equivalent to existing data types.
3.7	continue	G.	Enter a character from the standard input device
3.8	Automatic variables	H.	Returns the absolute value
3.9	int p(char *a[])	I.	Initial random number generator
3.10	typedef	J.	Return a random positive integer
		K.	Any number of consecutive characters, enclosed in double quotation marks
		L.	Send a character to standard output device
		M.	Names that are given to various program elements, such as variables.

4. Each statement below has a blank space to fit one of the word(s) or phrase(s) in the list below. Choose the most appropriate option, enter your choice in the “OMR” answer sheet supplied with the question paper, following instructions therein. (1x10)

A.	int *(p)(char *a[])	B.	union	C.	pointer
D.	external	E.	atoi	F.	lvalue
G.	rvalue	H.	&&	I.	ftell()
J.	parameters	K.	fseek()	L.	strcmp()
M.	int *(*p)(char(*a)[])				

- 4.1 _____ is a variable which holds the address of another variable.
- 4.2 A global variable is also known as _____ variable.
- 4.3 _____ accepts an argument which is an array of pointers to characters and returns a pointer to an integer quantity.
- 4.4 The argument list of function is known as function's _____.
- 4.5 C provides the _____ function to compare strings.
- 4.6 _____ converts a character string in the form of “whitespace sign digits” to an int value.
- 4.7 In compiler _____ error messages means that an object on left hand side of assignment operator is missing.
- 4.8 _____ is logical AND operator and output of AND operation is TRUE if both the operands are true.
- 4.9 _____ sets the position to a desired point in the file.
- 4.10 _____, contains members whose individual data types may differ from one another.

PART TWO
(Answer any FOUR questions)

- 5.
- a) Write program to generate multiplication table for first 'n' number, where 'n' is a user input.
 - b) Write a program to multiply two matrices.
- (7+8)**

- 6.
- a) Write program to compute factorial of a user input number using recursive function.
 - b) Write a program to write records of students in a file, where each record consists of student name, roll number, CGPA, and address. Read the records back from the file and display them.
 - c) Write difference between union and structure with example.
- (5+7+3)**

- 7.
- a) Write a program to input a set of numbers into an array. Pass the array to a function that finds and display the largest number.
 - b) Write in brief about storage classes in C.
- (8+7)**

- 8.
- a) Write a program using dynamic memory allocation to read numbers as input and display them in sorted order thereafter.
 - b) Write a program to concatenate two strings. (Do not use inbuilt string function).
- (8+7)**

- 9.
- a) Explain switch-case with a suitable example.
 - b) Write a program to generate the following patterns.

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

(6+9)
