

## 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 <b>TWO PARTS</b> in this Module/Paper. <b>PART ONE</b> contains <b>FOUR</b> questions and <b>PART TWO</b> contains <b>FIVE</b> questions.
भाग एक "वैकल्पिक" प्रकार का है जिसके कुल अंक 40 हैं तथा भाग दो, "व्यक्तिपरक" प्रकार है और इसके कुल अंक 60 हैं।	<b>PART ONE</b> is Objective type and carries 40 Marks. <b>PART TWO</b> 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।	<b>PART ONE</b> is to be answered in the <b>OMR ANSWER SHEET</b> only, supplied with the question paper, as per the instructions contained therein. <b>PART ONE</b> is <b>NOT</b> to be answered in the answer book for <b>PART TWO</b> .
भाग एक के लिए अधिकतम समय सीमा एक घण्टा निर्धारित की गई है। भाग दो की उत्तर-पुस्तिका, भाग एक की उत्तर-पुस्तिका जमा करने 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 <b>PART ONE</b> is <b>ONE HOUR</b> . Answer book for <b>PART TWO</b> will be supplied at the table when the answer sheet for <b>PART ONE</b> is returned. However, candidates who complete <b>PART ONE</b> earlier than one hour, can collect the answer book for <b>PART TWO</b> immediately after handing over the answer sheet for <b>PART ONE</b> .
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.
<b>नोट: यदि हिन्दी संस्करण में कोई त्रुटि / विसंगति पाई जाती है, तो उस अवस्था में अंग्रेजी संस्करण ही मान्य होगा।</b> <b>Note: In case of any discrepancy found in Hindi language, English version will be treated as final.</b>	

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 Which of the following software translates source code into object code?

- A) Compiler
- B) Interpreter
- C) Assembler
- D) None

1.2 Which one of the following is not a keyword in C language?

- A) main
- B) endl
- C) float
- D) switch

1.3 Identify the invalid character constant:

- A) '\n'
- B) '\$'
- C) '12'
- D) 'p'

1.4 What is the binary number equivalent of the decimal number 12?

- A) 1100
- B) 1010
- C) 1001
- D) 1110

1.5 Determine the order of evaluation of operations within the expression A<B&&C||D>A

- A) &&, ||, <, >
- B) <, >, &&, ||
- C) >, <, &&, ||
- D) &&, <, >, ||

1.6 How many times the printf statement within the while loop will be executed?

```
x=1;
while(x=0)
printf("hello");
```

- A) 1
- B) 0
- C) infinite
- D) 2

1.7 Find the output generated by the given program.

```
#include <stdio.h>
void main()
{
printf("Bre\nak");
}
```

- A) Break
- B) Bre\nak
- C) Break
- D) None

1.8 Which of the following is not an iterative statement?

- A) switch
- B) while
- C) do while
- D) for

1.9 Identify the storage class with which & operator cannot be used.

- A) register
- B) static
- C) extern
- D) auto

1.10 Identify the invalid declaration:

- A) int &p;
- B) int \*p[10];
- C) int \*\*p;
- D) int \*p[ ];

**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 The expressions on the both sides of a logical operator are always evaluated.

2.2 exit() function is defined in stdio.h header file.

2.3 for(; i<2; i++); statement will result in compilation error.

2.4 At the time of initialization of an array, dimension of the array need not to be specified.

2.5 Actual parameters are used at the time of function calling.

2.6 static storage class is used to make a variable global.

2.7 Array is passed to a function using 'call by value' method.

2.8 Pointers are used in a program to allocate memory before the program execution.

2.9 All the members of a union should be of same type.

2.10 The function strlen() computes the length of an argument string excluding the null character.

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	Symbol '='	A.	used with function
3.2	Void	B.	To terminate a loop
3.3	char *c[10];	C.	To declare global variable
3.4	calloc()	D.	c is array of size 10 where each element is a pointer to character
3.5	char (*c)[10]	E.	conio.h
3.6	Break	F.	storage class
3.7	Return	G.	c is a pointer pointing to string of size 10
3.8	Extern	H.	A function does not return anything
3.9	clrscr()	I.	an equality operator in C
3.10	call by reference	J.	assignment operator
		K.	stdio.h
		L.	Allocates memory and clears it
		M.	to get updated values of formal parameters of the function

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.	Flowchart	B.	ctype.h	C.	typecast
D.	Two	E.	structured	F.	four
G.	Ternary	H.	getch()	I.	three
J.	Array	K.	go to	L.	Auto
M.	Pseudocode				

- 4.1 \_\_\_\_\_ operator converts an expression to a specified type.
- 4.2 The conditional operator (?:) is a \_\_\_\_\_ operator.
- 4.3 Tool \_\_\_\_\_ is used for program design.
- 4.4 \_\_\_\_\_ statement is used for unconditional branching in C.
- 4.5 Input function \_\_\_\_\_ does not show the character read from the input device.
- 4.6 \_\_\_\_\_ is a derived data type.
- 4.7 Function isdigit() is defined in \_\_\_\_\_ header file.
- 4.8 By default, storage class of local variables is \_\_\_\_\_.
- 4.9 The output of 14 % 4 is \_\_\_\_\_.
- 4.10 The size of long integer data type is \_\_\_\_\_.

**PART TWO**  
Answer any FOUR questions)

- 5.
- a) Write a function `fnpow()` in C to compute  $x^y$  where  $x$  is float and  $y$  is integer. Function will return the result and takes  $x, y$  as arguments
- b) Write a function `fnmat()` which takes matrix,  $m, n$  as arguments where matrix is of size  $m \times n$  with  $m$  as rows and  $n$  as columns. Function should return the maximum and minimum elements of the matrix. Elements of matrix are of integer type.
- c) Find the output of the following:  

```
char p[] = "%d\n";  
p[1] = 'c';  
printf(p, 65);  
int k=40, *a;  
a=&k;  
(*a)++; k++;  
printf("\n k=%d",k);
```

**(5+6+4)**

- 6.
- a) Write a program using command line parameters to append one text file to another text file.
- b) Write down one similarity and one dissimilarity between `break` and `continue` statements.
- c) A programmer wants to use two variables `session` and `info`. Variable `session` can take three values (morning, afternoon, evening) only. Using variable `info`, the programmer wants to access information `empname` and `empid` of 30 employees. Name the appropriate data type used for each variable `session` and `info` and declare the variables.
- (8+2+5)**

- 7.
- a) Given array `a[10][10]` of integer where each integer takes 4 bytes. Given the base address of array `a` as 4000, find address of `a[4][5]` assuming array is stored as row-major order.
- b) Write a file statement to place a file pointer (fp) at the beginning of the record number (say R), where record size is B bytes.
- c) Differentiate between `struct` and `union`. When is `union` preferred over `struct`? Give one example for each.
- (5+3+7)**

- 8.
- a) Write a program to create a stack of integers using link-list and display it.
- b) What is macro? Define a macro to compute maximum of two arguments passed to it.
- (10+5)**

- 9.
- a) Explain differences between:  
i) Text file and binary file  
ii) static and extern storage class
- b) Write down the objective of following function:  

```
void f1(char s[], char c)  
{int i, j;  
for(i=j=0; s[i] != '\0'; i++)  
if (s[i]!=c) s[j++]=s[i];  
s[j] = '\0';  
return;  
}
```
- c) Explain the meaning of following declarations:  
i) `int *p(char *a[])`  
ii) `int *p(char *a, char *b)`  
iii) `int (*p) (char *a)[] (++)`
- (5+4+6)**

