A3-R4: PROGRAMMING & PROBLEM SOLVING THROUGH ‘C’ LANGUAGE

अधिकार: 03 घंटे
DURATION: 03 Hours

अधिकतम अंक: 100
MAXIMUM MARKS: 100

परीक्षार्थी का नाम: ____________________________________________________________
Name of Candidate: ____________________________________________________________

परीक्षार्थी के हर्दास्तः की उत्तर
Signature of candidate: _______________________________________________________

परीक्षार्थीयों के लिए निर्देशः
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 हिंदी एवं अंग्रेजी भाषा में है। परीक्षार्थी किसी एक भाषा का चयन कर सकता है। (अगर वह, या वह हिंदी या अंग्रेजी)
Question Paper is in Hindi and English language. Candidate can choose to answer in any one of the language (i.e., either Hindi or English)

इस मॉड्यूल में प्रश्न पत्रिका पर हताक्षर किए जाएंगे।
There are TWO PARTS in this Module / Paper. PART ONE contains FOUR questions and PART TWO contains FIVE questions.

भाग एक के उत्तर, इस प्रश्न-पत्र के साथ दी गई ओएमआर उत्तर-पुस्तिका पर, उसमें दिये गए अनुदेशों के अनुसार ही दिये जाने । भाग दो की उत्तर-पुस्तिका में भाग एक के उत्तर नहीं दिये जाने चाहिए।
PART ONE is Objective type and carries 40 Marks. PART TWO is subjective type and carries 60 Marks.

भाग एक के लिए अधिकतम समय सीमा एक घण्टा निर्धारित की गई है।
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 दो की उत्तर-पुस्तिका, भाग एक की उत्तर-पुस्तिका जगा 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 तुल्य 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, उस्मशिष्टिपत्रिका पर हर्दास्त इच्छुक बिना और अपनी उत्तर-पुस्तिका, निरीक्षक को सौंपने बिना, परीक्षा होल / समाप्त नहीं छोड़ सकते हैं। ऐसा नहीं करने पर, परीक्षार्थी को इस मॉड्यूल / पेपर में अधिकार घोषित कर दिया जाएगा।
Candidate cannot leave the examination hall / room without signing on the attendance sheet and 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 लिखना आरम्भ करने से पहले उम्मीदवार जाय कर यह सुनिश्चित कर लें कि प्रश्न-पुस्तिका स्वयं सुनिश्चित है।
After receiving the instruction to open the booklet and before starting to answer the questions, the candidate should ensure that the Question booklet is complete in all respect.

लाइट: यदि हिंदी संस्करण में कोई विस्तार / विस्तारित पैकेज जाता है, तो उस अवस्था में अंग्रेजी संस्करण ही मान्य होगा।
Note: In case of any discrepancy found in Hindi version, English version will be treated as final.

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 programming method is followed in C language?
A) Algorithm B) Flow-charts C) Procedural D) Object Oriented

1.2 getchar() function is available in which header file?
A) stdio.h B) conio.h C) math.h D) header.h

1.3 Find the output of following code

```c
int main()
{
    int i=-2;
    printf("-i = %d",-i);
    return 0;
}
```
A) -i=2 B) i=-2 C) -i=-2 D) -i=+2

1.4 Which numbering system is not handled directly by the printf() conversion specifiers?
A) Decimal B) Binary C) Octal D) Hexadecimal

1.5 Which of the following is an incorrect assignment statement?
A) N=m=0 B) Value+=10 C) mySize=x<y?9:11 D) Value=+=10

1.6 What will be the output of the following program?

```c
int main()
{
    int x=5;
    printf("%d %d %d",x,x<<2,x>>2);
}
```
A) 1 20 5 B) 5 1 20 C) 5 20 1 D) 20 1 5

1.7 A programming construct in which a set of statement in a computer program can be executed repeatedly.
A) Loop statement B) Conditional statement C) Block statement D) All of the above

1.8 What will be the output of following program?

```c
int main()
{
    for(int c=1;c<=5;++c);
    printf("%d",c);
}
```
A) 1 B) 5 C) 6 D) 12345

1.9 In C, if you pass an array as an argument to a function, what actually gets passed?
A) Value of elements in array B) First element of the array C) Base address of the array D) Address of the last element of array

1.10 How many times is a do while loop guaranteed to loop?
A) 0 B) Infinitely C) 1 D) Variable

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 Function can be called either by value or reference.

2.2 A function cannot be defined inside another function.

2.3 Are the three declarations char **apple, char *apple[][], and char apple[][] same?

2.4 A long double can be used if range of a double is not enough to accommodate a real number.

2.5 malloc() allocates memory from the heap and not from the stack.

2.6 While calling the fprintf() function in the format string conversion specifier %s can be used to write a character string in capital letters.

2.7 A union cannot be nested in a structure.

2.8 The modulus operator cannot be used with a long double.

2.9 If the file to be included doesn’t exist, the preprocessor flashes an error message.

2.10 A linked list is a linear data structure where each element is a separate object.
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.

<table>
<thead>
<tr>
<th>X</th>
<th>Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1 Calls itself</td>
<td>A. Infinite loop if no break statement inside the loop</td>
</tr>
<tr>
<td>3.2 String copy</td>
<td>B. A user-defined data type in C which allows you to combine different data types to store a particular type of record.</td>
</tr>
<tr>
<td>3.3 Unary operator</td>
<td>C. Modify the size of previously allocated space</td>
</tr>
<tr>
<td>3.4 while(2)</td>
<td>D. Recursive functions</td>
</tr>
<tr>
<td>3.5 Structure</td>
<td>E. strcpy()</td>
</tr>
<tr>
<td>3.6 realloc</td>
<td>F. Explicit conversion</td>
</tr>
<tr>
<td>3.7 exit()</td>
<td>G. --</td>
</tr>
<tr>
<td>3.8 Typecasting</td>
<td>H. Collection of similar type of data elements</td>
</tr>
<tr>
<td>3.9 'v' used for</td>
<td>I. logical operators</td>
</tr>
<tr>
<td>3.10 Array is a</td>
<td>J. strcat()</td>
</tr>
<tr>
<td>3.11 Terminates program</td>
<td>K. Terminates program</td>
</tr>
<tr>
<td>3.12 Vertical space</td>
<td>L. Vertical space</td>
</tr>
<tr>
<td>3.13 +</td>
<td>M. +</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>A. Const</th>
<th>B. continue</th>
<th>C. Two-dimensional</th>
</tr>
</thead>
<tbody>
<tr>
<td>D. Flowchart</td>
<td>E. fputs</td>
<td>F. 2 bytes</td>
</tr>
<tr>
<td>G. six</td>
<td>H. break</td>
<td>I. 4 bytes</td>
</tr>
<tr>
<td>J. sizeof</td>
<td>K. Multi-dimensional</td>
<td>L. *</td>
</tr>
<tr>
<td>M. &amp;</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4.1 Function ________ writes a line to a specified file.
4.2 Pictorial representation of an algorithm is ________.
4.3 A variable can be made constant by declaring it with the qualifier ________ at the time of initialization.
4.4 The ________ operator returns the number of byte the operand occupies.
4.5 By default, the real numbers are printed with a precision of ________ decimal places.
4.6 The ________ statement when executed in a switch statement causes immediate exit from the structure.
4.7 The ________ statement is used to skip a part of the statement in a loop.
4.8 An array that uses more than two subscript is referred to as ________ array.
4.9 After incrementing a float pointer ptr by 1 it would be incremented by ________.
4.10 The ________ operator return the value of the variable to which its operand points.
PART TWO
(Answer any FOUR questions)

5.
   a) Write a ‘C’ program to display following pattern:
      A
      B B
      C C C
      D D D D
      E E E E E
   b) Write a ‘C’ program that displays the recommended
      actions depending on the color of a traffic light
      using the switch statement.
   c) What is function? Explain uses of function.
      Also, explain declaration, function call and function
      definition with example. (4+4+7)

6.
   a) Write a ‘C’ program to find the frequency of
      characters in a String.
   b) Write a ‘C’ program to store information (title,
      author, subject and book id) of a Book using
      structure and display it in appropriate format.
   c) Write a ‘C’ program to find largest element of an
      Array. (5+5+5)

7.
   a) Draw a flowchart to find the Fibonacci series till
      term ≤ 1000.
   b) Explain different storage classes available in ‘C’.
      (7+8)

8.
   a) Explain about ‘pointer to function’ with suitable
      example.
   b) What are the advantages and disadvantages of an
      Array?
   c) Write a ‘C’ program to copy text of one file to
      another file. (5+5+5)

9.
   a) What is command line argument? Also, explain how
      to pass command line arguments to ‘C’ program.
   b) What are preprocessor directives? Why do we
      need them? Explain various preprocessor
      directives?
   c) Explain the difference between Text Mode and
      Binary Mode files. (5+5+5)