एम3-आर4: प्रोग्रामिंग एंड प्रॉब्लम सॉल्विंग थ्रू 'C' लैंग्वेज
M3-R4: PROGRAMMING & PROBLEM SOLVING THROUGH 'C' LANGUAGE

अवधि: 03 घंटे | **अधिकतम अंक: 100**
DURATION: 03 Hours | **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 हिन्दी एवं अंग्रेजी में है। परीक्षार्थी किसी भी एक भाषा का चयन कर सकता है। (अर्थात, या तो हिन्दी 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/पेपर के **दो भाग** है। **भाग एक** में चार प्रश्न और **भाग दो** में पाँच प्रश्न है।	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 है तथा **भाग दो**, "व्यक्तिपरक" प्रकार है और इसके कुल अंक 60 है।	**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 है। **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 हैं। ऐसा नही 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.
नोट: यदि हिन्दी संस्करण में कोई त्रुटि / विसंगति पाई जाती है, तो उस अवस्था में अँग्रेजी संस्करण ही मान्य होगा। **Note: In case of any discrepancy found in Hindi language, 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.

Hkkx ,d / PART ONE

¼lHkh iz'uksa ds mÙkj nsa½ / (Answer all the questions)

1. izR;sd iz'u ds mÙkjksa ds dbZ fodYi uhps fn, x, gSaA ,d lcls mi;qDr fodYi pqusa vkSj mls fuEufyf[kr funsZ'kksa ds vuqlkj iz'u i= ds lkFk miyC/k djk, x, ^^vks,evkj mÙkj i=d esa ntZ djsaA**

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 uhps fn, x;k ywi fdruh ckj fØ;kfUor gks tk,xk \

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

A) 0 ckj
B) vusd ckj
C) 10 ckj
D) 1 ckj

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 fuEufyf[kr izksxzke ds vkmViqV dk irk yxk,aA

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

A) Greater
B) Smaller
C) ladfyr esa xyrh
D) 100

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 fuEufyf[kr esa dkSu lk fLop dsl dFku fglkc ls Bhd ugha gS\ /

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

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

1.4 calloc() vkSj malloc() ds chp varj Li"V djsa %

A) calloc() ,d vkxqZesaV ysrk gS tcfd malloc() dks nks rdksZa dh t:jr gSA
B) malloc() ,d vkxqZesaV ysrk gS tcfd calloc() dks nks rdksZa dh t:jr gSA
C) malloc() 'kwU; ds fy, vkcafVr eseksjh vkjaHk djrk gS
D) calloc() fjDr ds fy, vkcafVr eseksjh vkjaHk djrk gS

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 getc() dk mn~ns'; D;k gS\

ROUGH WORK SPACE:

A) STDIN ls ,d o.kZ dks i<+saA
B) Qkby ls ,d o.kZ dks i<+saA
C) iwjh Qkby i<+saA
D) ;kn`fPNd :i esa Qkby dks i<+saA

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 'structure' vkSj 'union' ds chp varj gS %
A) ge 'structure' ds vanj 'functions' dks ifjHkkf"kr dj ldrs gSa ijarq ,d 'union' ds Hkhrj ughaA
B) ge 'union' ds vanj 'functions' dks ifjHkkf"kr dj ldrs gSa ijarq ,d 'structure' ds Hkhrj ughaA
C) ftl rjg ls eseksjh vkcafVr dh xbZ gSA
D) blesa dksbZ varj ugha gSA

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 C esa ojh;rk dk lgh Øe D;k gS\
A) tksM+uk] foHkktu] ekWM~;wYkl
B) tksM+uk] ekWM~;wYl] foHkktu
C) xq.kk] ?kVkuk] ekWM~;wYkl
D) ekWM~;wYkl] xq.kk] ?kVkuk

What is correct order of precedence in C?
A) Addition, Division, Modulus
B) Addition, Modulus, Division
C) Multiplication, Substration, Modulus
D) Modulus, Multiplication, Substration

1.8 C esa ,sjs dk uqdlku gksrk gS %
A) ge vklkuh ls izR;sd 'element' dk mi;ksx dj ldrs gSaA
B) ;g pj dh vf/kd dh ?kks"k.kk djuk vko';d gSA
C) ;g dsoy MsVk ds ,d izdkj dks gh LVksj dj ldrk gSA
D) blesa lkWfVZax vkWijs'ku dk izn'kZu djuk dfBu gSA

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 'identifier' dk dkSu lk voS/k uke gS\ / Which is invalid name of identifier?
A) world
B) addition23
C) test-name
D) factorial

1.10 C esa osfj,cy {ks= ds dkj.kA
A) ,d QaD'ku esa cuk;k x;k osfj,cy vU; QaD'ku esa mi;ksx ugha fd;k tk ldrkA
B) ,d QaD'ku esa cuk;k x;k osfj,cy vU; QaD'ku esa mi;ksx fd;k tk ldrk gSA
C) ,d QaD'ku esa cuk;k x;k osfj,cy dsoy eq[; QaD'ku esa gh iz;ksx fd;k tk ldrk gSA
D) mijksDr dksbZ ughaA

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

ROUGH WORK SPACE:

2- uhps fn, x, izR;sd fooj.k ;k rks lR; ;k vlR; gSA ,d lcls mi;qDr fodYi pqusa vkSj mls fuEufyf[kr funsZ'kksa ds vuqlkj iz'u i= ds lkFk miyC/k djk, x, ^^vks,evkj mÙkj i=d esa ntZ djsaA (1x10)**

2-1 QaD'ku ls ,d le; esa ,d ls vf/kd eku ugha fey ldrkA

2-2 QaD'ku dk vkºoku eku vkºoku ;k lanHkZ vkºoku }kjk fd;k tk ldrk gSA

2-3 D;k ;wfu;u ds lHkh ,fyesaV~l ds MsVk çdkj ,d tSls gksaxs \

2-4 ge ,d 2&vk;keh lj.kh dks xfr'khy :i ls vkcafVr dj ldrs gSaA

2-5 QaD'ku 'free()' dk mi;ksx xfr'khy :i ls vkcafVr eSeksjh dks okfil iqu% laHko mi;ksx djus ds fy, ghi gsrq tkjh djus ds fy, mi;ksx fd;k tkrk gSA

2-6 vxj ih lwpd gS rks fQj vfHkO;fDr p = p + 1(blesa ih ds izdkj ds ijs eku esa 1 tksM+k tk ldrk gSA

2-7 fLVªax "Bilbo Baggins", dks 13 o.kkZsa dhs ,d lj.kh esa laxzfgr fd;k tk ldrk gSA

2-8 typedef dks ,d izdkj ds Kkr MsVk dks u;k uke nsus ds fy, mi;ksx fd;k tkrk gSA

2-9 ,d LFkSfrd pj dk thoudky og vof/k gS ftlus vius dk;ZØe dks fØ;kUo;u fd;kA

2-10 rhu ?kks"k.kk,a char **apple, char *apple[], and char apple[][] ,d TkSlh gSa \

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?

ROUGH WORK SPACE:

ROUGH WORK SPACE:

3- dkWye X esa fn, x, ‘kCnksa vkSj okD;ksa dk feyku dkWye Y esa fn, x, fudVre lacaf/kr vFkZ @ ‘kCnksa @ okD;ksa ls djsaA muesa fn, x, vuqns’kksa dk ikyu djrs gq, vius fodYi iz’u i= ds lkFk fn, x, ^^vks,evkj mÙkj i=d esa ntZ djsaA**

¼1x10½

X		Y	
3.1	lkgpkudrkZ	A.	ywi dks lekIr djus ;k fLop ls ckgj fudkus ds fy, iz;qDrA
3.2	fLVªax dkWULVsaV	B.	,d ywi ds ek/;e ls orZeku ikl ds 'ks"k ck;ikl djus ds fy, iz;qDrA
3.3	getchar()	C.	Ikk=ksa ds fy, ladsr dh ,d lj.kh gS tks ,d rdZ Lohdk;Z gSA
3.4	rand()	D.	,d vkxqZesaV gS tks ,d xq.k ds fy, ,d lwpd gS Lohdkj djrk gSA
3.5	putchar()	E.	,d ckj fu;a=.k QaD'ku dks ifjHkkf"kr dss ckgj LFkkukarfjr gks tkus ij bldk eku cjdkj ugha jgrkA
3.6	break()	F.	iz;ksDrk ,d u, MsVk izdkj dks ifjHkkf"kr djus ds fy, vuqefr nsrk gS tks ekStwnk MsVk ds izdkj ds cjkcj gSA
3.7	continue	G.	ekud buiqV fMokbl dk ,d xq.k gSA
3.8	Lopkfyr pj	H.	fujis{k eku nsrk gSA
3.9	int p(char *a[])	I.	IkzkjafHkd ;kn`fPNd la[;k tujsVjA
3.10	typedef	J.	fQj ls ,d ;kn`fPNd ldkjkRed iw.kkZadA
		K.	yxkrkj o.kZ dh dksbZ Hkh la[;k ftls nksgjs m)j.k fpUgksa esa ifjc) fd;k x;k gSA
		L.	Ekkud vkmViqV fMokbl ds fy, ,d o.kZ HkstsaA
		M.	Oks uke tkss fofHkUu dk;ZØeksa ds rRoksa dkss fn, tkrs gSa] tSls pjA

4- uhps fn, x, izR;sd okD; esa uhps nh xbZ lwph ls ,d ‘kCn ;k okD; dks [kkyh LFkku esa yxk,aA lcls mi;qDr fodYi pqusa vkSj mls fuEufyf[kr vuqns’kksa ds vuqlkj iz’u i= ds lkFk fn, x, ^^vks,evkj mÙkj i=d esa viuk fodYi ntZ djsaA**

¼1x10½

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)[ ])				

ROUGH WORK SPACE:

4-1 ____ ,d pj gS tks ,d vU; pj dk irk j[krk gSA

4-2 ,d Xykscy pj dks ____ pj ds uke ls Hkh tkuk tkrk gSA

4-3 ____ ,d vkxqZesaV dks Lohdkj djrk gS tks o.kksZas ds fy, ladsrd dh ,d lj.kh gS vkSj ,d iw.kkZad ek=k ds fy, ,d lwpd fjVuZ djrk gSA

4-4 QaD'ku dk vkxqZesaV lwph QaD'ku ds ____ ds :i esa tkuk tkrk gSA

4-6 lh ____ QaD'ku esa fLVªax dh rqyuk djus ds fy, iznku djrk gSA

4.6 _____ ,d int eku "whitespace sign digits" ds :i esa ,d dSjsDVj fLVªax dks dUoVZ djrk gSA

4-7 daikbyj esa ____ ,jj eSlst dk vFkZ gS fd vlkbuesaV vkWijsVj ds ck,a gkFk dh vksj ,d vkWCtsDV feflax gSA

4-8 ____ rkfdZd AND vkWijsVj gS vkSj AND dk vkmViqV vkWijs'ku lR; gS ;fn nksuksa vkWijsaM lR; gaSA

4-9 ____ Qkby esa ,d okafNr fcanq dh fLFkfr fu/kkZfjr djrk gSA

4-10 ____] 'kkfey lnL; ftudk O;fDrxr MsVk Vkbi ,d nwljs ls vyx gks ldrk gSA

ROUGH WORK SPACE:

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.

ROUGH WORK SPACE:

Hkkx nks / PART TWO

¼fdUgha pkj iz'uksa dk mÙkj nsa½/(Answer any FOUR questions)

5.

a) igys ^,u* uacj ds fy, xq.kkRed rkfydk cukus ds fy, izksxzke fy[ksa tgka ^,u* iz;ksDrk }kjk buiqV fd;k tk,xk A

b) nks eSfVªDl dks xq.kk djus ds fy, ,d izksxzke fy[ksaA

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) iz;ksDrk buiqV la[;k ds HkkT; dh x.kuk djus ds fy, iqujkorhZ QaD'ku dk mi;ksx djrs gq, ,d izksxzke fy[ksaA

b) ,d Qkby esa Nk=ksa dk fjdkWMZ rS;kj djus ds fy, izksxzke fy[ksasa] tgka izR;sd vfHkys[k esa Nk= dk uke] jksy uacj] lhthih, vkSj irk gksrk gSA vfHkys[k Qkby ls okil i<+sa vkSj mUgsa iznf'kZr djsaA

c) mnkgj.k ds lkFk 'union' vkSj 'structure' ds chp ds varj dks Li"V djsaA

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) ,d lj.kh esa la[;k dk ,d lsV rS;kj djus ds fy, izksxzke fy[ksaA lj.kh dks QaD'ku esa ikl djsa tks lcls cM+h la[;k dk irk yxkrh vkSj fMLIys djrh gS \

b) lh esa LVksjst Dyklst ds ckjs esa la{ksIk esa fy[ksaA

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) ,d izksxzke rS;kj djssa tks xfr'khy eseksjh esa vkcaVu ds mi;ksx ls buiqV la[;k i<+ ldrs gSa vkSj mlds ckn pqus gq, Øe esa mUgsa iznf'kZr djsaA

b) nks fLVªax dks tksM+us ds izksxzke dks fy[ksaA ¼bufcYV fLVªax QaD'ku dk mi;ksx u djsa½A

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) mi;qDr mnkgj.k ds lkFk fLop dsl le>k,aA

b) fuEufyf[kr iSVuZ mRiUu djus ds fy, ,d izksxzke fy[ksaA

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

a) Explain switch-case with a suitable example.

b) Write a program to generate the following patterns.

```
        *
      *   *  *
```


ROUGH WORK SPACE:

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

(6+9)

*****

ROUGH WORK SPACE: