



SUMMER – 2019 EXAMINATION
MODEL ANSWER

Subject: Programming in C

Subject Code: 22226

Important Instructions to examiners:

- 1) The answers should be examined by key words and not as word-to-word as given in the model answer scheme.
- 2) The model answer and the answer written by candidate may vary but the examiner may try to assess the understanding level of the candidate.
- 3) The language errors such as grammatical, spelling errors should not be given more Importance (Not applicable for subject English and Communication Skills).
- 4) While assessing figures, examiner may give credit for principal components indicated in the figure. The figures drawn by candidate and model answer may vary. The examiner may give credit for any equivalent figure drawn.
- 5) Credits may be given step wise for numerical problems. In some cases, the assumed constant values may vary and there may be some difference in the candidate's answers and model answer.
- 6) In case of some questions credit may be given by judgement on part of examiner of relevant answer based on candidate's understanding.
- 7) For programming language papers, credit may be given to any other program based on equivalent concept.

Q. No	Sub Q.N.	Answer	Marking Scheme
1.	(a) Ans.	<p>Attempt any FIVE of the following: Draw flowchart for checking whether given number is even or odd.</p> <pre>graph TD; START([START]) --> Input[/Input Value A/]; Input --> Decision{IS a%2==0?}; Decision -- Yes --> PrintEven[/Print "The number is even"/]; PrintEven --> STOP([STOP]); Decision -- No --> PrintOdd[/Print "The number is odd"/]; PrintOdd --> STOP;</pre>	10 2M <i>Correct logic 1M</i> <i>Relevant symbol 1M</i>



MAHARASHTRA STATE BOARD OF TECHNICAL EDUCATION
(Autonomous)
(ISO/IEC - 27001 - 2005 Certified)

SUMMER – 2019 EXAMINATION
MODEL ANSWER

Subject: Programming in C

Subject Code: 22226

(b)	List any four keywords used in 'C' with their use. <i>(Note: Any other relevant keyword in 'C' may be considered).</i>	2M																																																				
	Ans.																																																					
	<table border="1"><thead><tr><th>Keyword</th><th>Use</th></tr></thead><tbody><tr><td>auto</td><td>It is used to declare auto storage class variable.</td></tr><tr><td>break</td><td>It is used to exit from block or loop.</td></tr><tr><td>case</td><td>It is used to represent possible case inside switch case statement</td></tr><tr><td>char</td><td>Used for declaration of character type variable</td></tr><tr><td>const</td><td>It is used to declare a constant.</td></tr><tr><td>continue</td><td>It is used pass control at the beginning of the loop</td></tr><tr><td>default</td><td>It is used to represent default case inside switch case statement.</td></tr><tr><td>do</td><td>It is used to execute loop in association with while condition.</td></tr><tr><td>double</td><td>Used for declaration of double type variable</td></tr><tr><td>else</td><td>It is used with if statement to transfer control to statement when condition is false.</td></tr><tr><td>enum</td><td>It is used to declare enumerated data.</td></tr><tr><td>extern</td><td>It is used to declare extern storage class variable</td></tr><tr><td>float</td><td>Used for declaration of float type variable</td></tr><tr><td>for</td><td>Used for repetitive execution of statements</td></tr><tr><td>goto</td><td>It is used to transfer control from one statement to another</td></tr><tr><td>if</td><td>It is used for condition checking</td></tr><tr><td>int</td><td>Used for declaration of integer type variable</td></tr><tr><td>long</td><td>Used for declaration of long type variable</td></tr><tr><td>register</td><td>It is used to declare register storage class variable</td></tr><tr><td>return</td><td>It is used to return value from function.</td></tr><tr><td>short</td><td>Used for declaration of short type variable</td></tr><tr><td>signed</td><td>Used for declaration of signed type variable</td></tr><tr><td>sizeof</td><td>It returns memory size allocated to variable or data type</td></tr><tr><td>static</td><td>It is used to declare static storage class variable</td></tr><tr><td>struct</td><td>It is used to declare user defined data type structure</td></tr></tbody></table>	Keyword	Use	auto	It is used to declare auto storage class variable.	break	It is used to exit from block or loop.	case	It is used to represent possible case inside switch case statement	char	Used for declaration of character type variable	const	It is used to declare a constant.	continue	It is used pass control at the beginning of the loop	default	It is used to represent default case inside switch case statement.	do	It is used to execute loop in association with while condition.	double	Used for declaration of double type variable	else	It is used with if statement to transfer control to statement when condition is false.	enum	It is used to declare enumerated data.	extern	It is used to declare extern storage class variable	float	Used for declaration of float type variable	for	Used for repetitive execution of statements	goto	It is used to transfer control from one statement to another	if	It is used for condition checking	int	Used for declaration of integer type variable	long	Used for declaration of long type variable	register	It is used to declare register storage class variable	return	It is used to return value from function.	short	Used for declaration of short type variable	signed	Used for declaration of signed type variable	sizeof	It returns memory size allocated to variable or data type	static	It is used to declare static storage class variable	struct	It is used to declare user defined data type structure	<p><i>Any four keywords 1M</i></p> <p><i>Use 1M</i></p>
Keyword	Use																																																					
auto	It is used to declare auto storage class variable.																																																					
break	It is used to exit from block or loop.																																																					
case	It is used to represent possible case inside switch case statement																																																					
char	Used for declaration of character type variable																																																					
const	It is used to declare a constant.																																																					
continue	It is used pass control at the beginning of the loop																																																					
default	It is used to represent default case inside switch case statement.																																																					
do	It is used to execute loop in association with while condition.																																																					
double	Used for declaration of double type variable																																																					
else	It is used with if statement to transfer control to statement when condition is false.																																																					
enum	It is used to declare enumerated data.																																																					
extern	It is used to declare extern storage class variable																																																					
float	Used for declaration of float type variable																																																					
for	Used for repetitive execution of statements																																																					
goto	It is used to transfer control from one statement to another																																																					
if	It is used for condition checking																																																					
int	Used for declaration of integer type variable																																																					
long	Used for declaration of long type variable																																																					
register	It is used to declare register storage class variable																																																					
return	It is used to return value from function.																																																					
short	Used for declaration of short type variable																																																					
signed	Used for declaration of signed type variable																																																					
sizeof	It returns memory size allocated to variable or data type																																																					
static	It is used to declare static storage class variable																																																					
struct	It is used to declare user defined data type structure																																																					



MAHARASHTRA STATE BOARD OF TECHNICAL EDUCATION
(Autonomous)
(ISO/IEC - 27001 - 2005 Certified)

SUMMER – 2019 EXAMINATION
MODEL ANSWER

Subject: Programming in C

Subject Code: 22226

		<table border="1" style="width: 100%; border-collapse: collapse;"> <tbody> <tr> <td style="width: 20%;">switch</td> <td>It is used to make decision from multiple number of inputs</td> </tr> <tr> <td>typedef</td> <td>Used to redefine the name of an existing variable type.</td> </tr> <tr> <td>union</td> <td>It is used to declare the data type union</td> </tr> <tr> <td>unsigned</td> <td>Used for declaration of unsigned type variable</td> </tr> <tr> <td>void</td> <td>Specify that function does not return any value</td> </tr> <tr> <td>volatile</td> <td>It is used to declare a volatile variable</td> </tr> <tr> <td>while</td> <td>Used for repetitive execution of statements</td> </tr> </tbody> </table>	switch	It is used to make decision from multiple number of inputs	typedef	Used to redefine the name of an existing variable type.	union	It is used to declare the data type union	unsigned	Used for declaration of unsigned type variable	void	Specify that function does not return any value	volatile	It is used to declare a volatile variable	while	Used for repetitive execution of statements	
switch	It is used to make decision from multiple number of inputs																
typedef	Used to redefine the name of an existing variable type.																
union	It is used to declare the data type union																
unsigned	Used for declaration of unsigned type variable																
void	Specify that function does not return any value																
volatile	It is used to declare a volatile variable																
while	Used for repetitive execution of statements																
	<p>(c) Ans.</p>	<p>Write the syntax of switch case statement.</p> <pre>switch(variable) { case value1: statements break; case value2: statements; break; . . . default: statements; break; }</pre>	<p>2M</p> <p><i>Correct syntax 2M</i></p>														
	<p>(d) Ans.</p>	<p>State any two differences between while and do-while statement. <i>(Note: Any 2 points shall be considered).</i></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%; text-align: center;">while</th> <th style="width: 50%; text-align: center;">Do-while</th> </tr> </thead> <tbody> <tr> <td>In 'while' loop the controlling condition appears at the start of the loop.</td> <td>In 'do-while' loop the controlling condition appears at the end of the loop.</td> </tr> <tr> <td>The iterations do not occur if, the condition at the first iteration, appears false.</td> <td>The iteration occurs at least once even if the condition is false at the first iteration.</td> </tr> <tr> <td>It is an entry controlled loop</td> <td>It is an exit controlled loop</td> </tr> <tr> <td>while(condition) { body</td> <td>do { body</td> </tr> </tbody> </table>	while	Do-while	In 'while' loop the controlling condition appears at the start of the loop.	In 'do-while' loop the controlling condition appears at the end of the loop.	The iterations do not occur if, the condition at the first iteration, appears false.	The iteration occurs at least once even if the condition is false at the first iteration.	It is an entry controlled loop	It is an exit controlled loop	while(condition) { body	do { body	<p>2M</p> <p><i>Any two differences 1M each</i></p>				
while	Do-while																
In 'while' loop the controlling condition appears at the start of the loop.	In 'do-while' loop the controlling condition appears at the end of the loop.																
The iterations do not occur if, the condition at the first iteration, appears false.	The iteration occurs at least once even if the condition is false at the first iteration.																
It is an entry controlled loop	It is an exit controlled loop																
while(condition) { body	do { body																



MAHARASHTRA STATE BOARD OF TECHNICAL EDUCATION
(Autonomous)
(ISO/IEC - 27001 - 2005 Certified)

SUMMER – 2019 EXAMINATION
MODEL ANSWER

Subject: Programming in C

Subject Code: 22226

		}	}while(condition);	
(e)	State difference between array and string.			2M
Ans.	<i>(Note: Any two valid points shall be considered).</i>			
	Array	String		
	Array can be of any type like int, float, char.	String can contain only characters.		<i>Any two points 1M for each</i>
	Element Elements in an array can be accessed using its position like a[2].s in an array can be accessed using its position like a[2].	Characters in string are accessed sequentially from first to last.		
	Array does not end with a null character	String is ended with a '\0' character.		
	Array size once declared cannot be changed	String size can be modified using pointer.		
(f)	Declare a structure student with element roll-no and name.			
Ans.	<pre>struct student { int roll_no; char name[20]; };</pre>			<i>Correct declaration on 2M</i>
(g)	Distinguish between call by value and call by reference.			2M
Ans.	<i>(Note: Any two points shall be considered).</i>			
	Call by value	Call by reference		
	A copy of actual arguments is passed to respective formal arguments.	The address of actual arguments is passed to formal arguments		<i>Any two points 1M each</i>
	Actual arguments will remain safe, they cannot be modified accidentally.	Alteration to actual arguments is possible within from called function; therefore the code must handle arguments carefully else you get unexpected results.		
	Address of the actual and formal arguments are different	Address of the actual and formal arguments are the same		
	Changes made inside the function is not reflected in other functions	Changes made in the function is reflected outside also.		
2.	Attempt any THREE of the following:			12
(a)	State four arithmetic operations perform on pointer with			4M



MAHARASHTRA STATE BOARD OF TECHNICAL EDUCATION
(Autonomous)
(ISO/IEC - 27001 - 2005 Certified)

SUMMER – 2019 EXAMINATION
MODEL ANSWER

Subject: Programming in C

Subject Code: 22226

	<p>Ans.</p>	<p>example. (<i>Note: Code snippet shall be considered</i>) The pointer arithmetic is done as per the data type of the pointer. The basic operations on pointers are Increment: It is used to increment the pointer. Each time a pointer is incremented, it points to the next location with respect to memory size . Example, If ptr is an integer pointer stored at address 1000, then ptr++ shows 1002 as incremented location for an int. It increments by two locations as it requires two bytes storage. Decrement: It is used to decrement the pointer. Each time a pointer is decremented, it points to the previous location with respect to memory size. Example, If the current position of pointer is 1002, then decrement operation ptr-- results in the pointer pointing to the location 1000 in case of integer pointer as it requires two bytes storage. Addition When addition operation is performed on pointer, it gives the location incremented by the added value according to data type. Eg: If ptr is an integer pointer stored at address 1000, Then ptr+2 shows $1000+(2*2) = 1004$ as incremented location for an int. Subtraction When subtraction operation is performed on the pointer variable, it gives the location decremented by the subtracted value according to data type. Eg: If ptr is an integer pointer stored at address 1004, Then ptr-2 shows $1004-(2*2) = 1000$ as decremented location for an int.</p>	<p><i>Each operation with example 1M</i></p>
	<p>(b)</p>	<p>Draw flowchart for checking whether given number is prime or</p>	<p>4M</p>



MAHARASHTRA STATE BOARD OF TECHNICAL EDUCATION
(Autonomous)
(ISO/IEC - 27001 - 2005 Certified)

SUMMER – 2019 EXAMINATION
MODEL ANSWER

Subject: Programming in C

Subject Code: 22226

	<p>Ans.</p>	<p>not.</p> <pre>graph TD; Start([Start]) --> Set[Set i=2, flag=0]; Set --> Input[/Input no/]; Input --> Loop{if i <= no/2}; Loop -- Yes --> Div{no%i=0}; Div -- Yes --> SetFlag[Set flag=1]; Div -- No --> Inc[i=i+1]; SetFlag --> Loop; Inc --> Loop; Loop -- No --> Prime[/prime/]; SetFlag --> Flag{if flag==1}; SetFlag --> Flag; SetFlag --> NotPrime[/not prime/]; Flag -- Yes --> NotPrime; Flag -- No --> Prime; NotPrime --> Stop([Stop]); Prime --> Stop;</pre>	<p>Correct logic 2M</p> <p>Symbols 2M</p>
	<p>(c)</p> <p>Ans.</p>	<p>Write a program to reverse the number 1234 (i.e. 4321) using function. (Note: Any other correct logic shall be considered).</p> <pre>#include<stdio.h> #include<conio.h> void findReverse(); void main() { findReverse(); } void findReverse() {</pre>	<p>4M</p> <p>Correct syntax 2M</p> <p>Correct logic 2M</p>



MAHARASHTRA STATE BOARD OF TECHNICAL EDUCATION
(Autonomous)
(ISO/IEC - 27001 - 2005 Certified)

SUMMER – 2019 EXAMINATION
MODEL ANSWER

Subject: Programming in C

Subject Code: 22226

		<pre>int num, res=0,ans=0; clrscr(); printf("Enter the number"); scanf("%d", &num); while(num!=0) { res=num%10; ans=ans*10+res; num=num/10; } printf("Reverse number is %d", ans); getch(); }</pre>										
	<p>(d)</p> <p>Ans.</p>	<p>Differentiate between character array and integer array with respect to size and initialisation.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 25%;">Parameter</th> <th style="width: 35%;">Character Array</th> <th style="width: 40%;">Integer Array</th> </tr> </thead> <tbody> <tr> <td>Size</td> <td>Last location in character array is filled with '\0' so the array size should be so declared that it should have one last location for '\0' character.</td> <td>No extra location than the number of elements is required.</td> </tr> <tr> <td>Initialization</td> <td>Initialization can be done like : char str[4]={'a','b','c','\0'}; char str[4]="abc";</td> <td>Initialization can be done like : int arr[4]={1,2,3,4};</td> </tr> </tbody> </table>	Parameter	Character Array	Integer Array	Size	Last location in character array is filled with '\0' so the array size should be so declared that it should have one last location for '\0' character.	No extra location than the number of elements is required.	Initialization	Initialization can be done like : char str[4]={'a','b','c','\0'}; char str[4]="abc";	Initialization can be done like : int arr[4]={1,2,3,4};	<p>4M</p> <p><i>Each parameter 2M</i></p>
Parameter	Character Array	Integer Array										
Size	Last location in character array is filled with '\0' so the array size should be so declared that it should have one last location for '\0' character.	No extra location than the number of elements is required.										
Initialization	Initialization can be done like : char str[4]={'a','b','c','\0'}; char str[4]="abc";	Initialization can be done like : int arr[4]={1,2,3,4};										
3.	<p>(a)</p> <p>Ans.</p>	<p>Attempt any THREE of the following:</p> <p>Write a program to sum all the odd numbers between 1 to 20. <i>(Note: Any other correct logic shall be considered).</i></p> <pre>#include<stdio.h> #include<conio.h> void main() { int sum=0,i; clrscr(); for(i=1;i<=20;i++)</pre>	<p>12</p> <p>4M</p> <p><i>Correct logic 2M</i></p>									



MAHARASHTRA STATE BOARD OF TECHNICAL EDUCATION
(Autonomous)
(ISO/IEC - 27001 - 2005 Certified)

SUMMER – 2019 EXAMINATION
MODEL ANSWER

Subject: Programming in C

Subject Code: 22226

		<pre> { if(i%2==1) sum=sum+i; } printf("sum of odd no"s between 1 to 20 is %d",sum); getch(); } </pre>	<p><i>Correct syntax</i> 2M</p>
	<p>(b) Ans.</p>	<p>Explain any four bit-wise operator used in ‘C’ with example.</p> <p>Bitwise operators:</p> <p>Bitwise OR – It takes 2 bit patterns and performs OR operations on each pair of corresponding bits. The following example will explain it.</p> <pre> 1010 1100 ----- OR 1110 </pre> <p>Bitwise AND – & It takes 2 bit patterns and performs AND operations with it.</p> <pre> 1010 1100 ----- AND 1000 ----- </pre> <p>The Bitwise AND will take pair of bits from each position, and if only both the bit is 1, the result on that position will be 1. Bitwise AND is used to Turn-Off bits.</p> <p>Bitwise NOT One’s complement operator (Bitwise NOT) is used to convert each “1-bit to 0-bit” and “0-bit to 1-bit”, in the given binary pattern. It is a unary operator i.e. it takes only one operand.</p> <pre> 1001 NOT 0110 ----- </pre> <p>Bitwise XOR ^ Bitwise XOR ^, takes 2 bit patterns and perform XOR operation with it.</p>	<p>4M</p> <p><i>Explanation with example of any four bitwise operator</i> 1M each</p>



MAHARASHTRA STATE BOARD OF TECHNICAL EDUCATION
(Autonomous)
(ISO/IEC - 27001 - 2005 Certified)

SUMMER – 2019 EXAMINATION
MODEL ANSWER

Subject: Programming in C

Subject Code: 22226

		<pre>0101 0110 ----- XOR 0011 -----</pre> <p>Left shift Operator – << The left shift operator will shift the bits towards left for the given number of times. int a=2<<1;</p> <p>Right shift Operator – >> The right shift operator will shift the bits towards right for the given number of times. int a=8>>1;</p>	
	<p>(c)</p> <p>Ans.</p>	<p>With suitable example, explain how two dimensional arrays can be created.</p> <p>The array which is used to represent and store data in a tabular form is called as two dimensional array. Such type of array is specially used to represent data in a matrix form.</p> <p>Declaration of two dimensional arrays: <i>Syntax:-</i> Data type arrayname [row size] [column size]; <i>Eg:</i> int arr[3][4]; This will declare array “arr” with 3 rows and 4 columns. A two-dimensional array can be considered as a table which will have x number of rows and y number of columns. A two-dimensional array a, which contains three rows and four columns can be shown as follows –</p>	<p>4M</p> <p><i>Explanation 2M</i></p>



MAHARASHTRA STATE BOARD OF TECHNICAL EDUCATION
(Autonomous)
(ISO/IEC - 27001 - 2005 Certified)

SUMMER – 2019 EXAMINATION
MODEL ANSWER

Subject: Programming in C

Subject Code: 22226

	<table border="1" style="margin: auto; border-collapse: collapse;"> <thead> <tr> <th style="padding: 5px;">Column 0</th> <th style="padding: 5px;">Column 1</th> <th style="padding: 5px;">Column 2</th> <th style="padding: 5px;">Column 3</th> </tr> </thead> <tbody> <tr> <td style="padding: 5px;">Row 0 a[0][0]</td> <td style="padding: 5px;">a[0][1]</td> <td style="padding: 5px;">a[0][2]</td> <td style="padding: 5px;">a[0][3]</td> </tr> <tr> <td style="padding: 5px;">Row 1 a[1][0]</td> <td style="padding: 5px;">a[1][1]</td> <td style="padding: 5px;">a[1][2]</td> <td style="padding: 5px;">a[1][3]</td> </tr> <tr> <td style="padding: 5px;">Row 2 a[2][0]</td> <td style="padding: 5px;">a[2][1]</td> <td style="padding: 5px;">a[2][2]</td> <td style="padding: 5px;">a[2][3]</td> </tr> </tbody> </table> <p style="margin-top: 10px;">Thus, every element in the array a is identified by an element name of the form a[i][j], where 'a' is the name of the array, and 'i' and 'j' are the subscripts that uniquely identify each element in 'a'.</p> <p>Example : <pre>main() { int a[2][2]={{1,2},{4,5}}; int i,j; for(i=0;i<2;i++) { for(j=0;j<2;j++) { printf("%d",a[i][j]); } printf("\n"); } }</pre></p>	Column 0	Column 1	Column 2	Column 3	Row 0 a[0][0]	a[0][1]	a[0][2]	a[0][3]	Row 1 a[1][0]	a[1][1]	a[1][2]	a[1][3]	Row 2 a[2][0]	a[2][1]	a[2][2]	a[2][3]	<p><i>Example</i> 2M</p>
Column 0	Column 1	Column 2	Column 3															
Row 0 a[0][0]	a[0][1]	a[0][2]	a[0][3]															
Row 1 a[1][0]	a[1][1]	a[1][2]	a[1][3]															
Row 2 a[2][0]	a[2][1]	a[2][2]	a[2][3]															
<p>(d) Ans.</p>	<p>Explain any two string functions with example. Strlen function: strlen() function in C gives the length of the given string. strlen() function counts the number of characters in a given string and returns the integer value. It stops counting the character when null character is found. Because, null character indicates the end of the string in C. Syntax: strlen(stringname); Example: Consider str1="abc" strlen(str1); returns length of str1 as 3</p>	<p>4M</p> <p><i>Explanation of any two string functions 1M each, example 1M each</i></p>																



MAHARASHTRA STATE BOARD OF TECHNICAL EDUCATION
(Autonomous)
(ISO/IEC - 27001 - 2005 Certified)

SUMMER – 2019 EXAMINATION
MODEL ANSWER

Subject: Programming in C

Subject Code: 22226

		<p>strcat() function: In C programming, strcat() concatenates (joins) two strings. It concatenates source string at the end of destination string. Syntax: strcat(destination source, source string); Example: Consider str1="abc" and str2="def" strcat(str1,str2); returns abcdef in str1 and str2 remains unchanged.</p> <p>strcpy() function strcpy() function copies portion of contents of one string into another string. Syntax: strcpy(destination string, source string, size); Example: Consider str1="abc" strcpy(str1,str2); returns abcstr2</p> <p>strcmp() function The strcmp function compares two strings which are passed as arguments to it. If the strings are equal then function returns value 0 and if they are not equal the function returns some numeric value. Syntax: strcmp(str1, str2); Example: Consider str1="abc" and str2="abc" Then strcmp(str1,str2) returns 0 as both the strings are same.</p>	
4.	(a) Ans.	Attempt any THREE of the following: Draw flowchart for finding largest number among three numbers.	12 4M



**SUMMER – 2019 EXAMINATION
 MODEL ANSWER**

Subject: Programming in C

Subject Code: 22226

	<pre> graph TD Start([Start]) --> Decl[Declare variables a, b and c] Decl --> Read[/Read a, b and c/] Read --> IsAB{is a > b?} IsAB -- True --> IsAC{is a > c?} IsAB -- False --> IsBC{is b > c?} IsAC -- True --> PrintA[/Print a/] IsAC -- False --> PrintC[/Print c/] IsBC -- True --> PrintB[/Print b/] IsBC -- False --> PrintC PrintA --> Stop([Stop]) PrintB --> Stop PrintC --> Stop </pre>	<p><i>Correct flowchart 4M</i></p>					
<p>(b) Ans.</p>	<p>Describe generic structure of 'C' program.</p> <div style="border: 1px solid black; padding: 10px; margin: 10px 0;"> <p>Documentation section</p> <hr/> <p>Link section</p> <hr/> <p>Definition section</p> <hr/> <p>Global declaration section</p> <hr/> <p>main () Function section</p> <pre> { Declaration part Executable part } </pre> <p>Subprogram section</p> <table style="width: 100%; border-collapse: collapse;"> <tr><td style="border: 1px solid black; padding: 2px;">Function 1</td></tr> <tr><td style="border: 1px solid black; padding: 2px;">Function 2</td></tr> <tr><td style="border: 1px solid black; padding: 2px;">.....</td></tr> <tr><td style="border: 1px solid black; padding: 2px;">.....</td></tr> <tr><td style="border: 1px solid black; padding: 2px;">Function n</td></tr> </table> <p style="text-align: right; margin-right: 50px;">(User defined functions)</p> </div>	Function 1	Function 2	Function n	<p style="text-align: center;">4M</p> <p style="text-align: center;"><i>List of sections from structure 1M</i></p>
Function 1							
Function 2							
.....							
.....							
Function n							



SUMMER – 2019 EXAMINATION
MODEL ANSWER

Subject: Programming in C

Subject Code: 22226

		<p>Documentation section: The documentation section consists of a set of comment lines giving the name of the program, the author and other details, which the programmer would like to use later.</p> <p>Link section: The link section provides instructions to the compiler to link functions from the system library such as using the #include directive.</p> <p>Definition section: The definition section defines all symbolic constants such using the #define directive.</p> <p>Global declaration section: There are some variables that are used in more than one function. Such variables are called global variables and are declared in the global declaration section that is outside of all the functions.</p> <p>Declaration part: The declaration part declares all the variables used in the executable part.</p> <p>Subprogram section: If the program is a multi-function program then the subprogram section contains all the user-defined functions that are called in the main () function. User-defined functions are generally placed immediately after the main () function, although they may appear in any order.</p> <p>Header files A header file is a file with extension .h which contains C function declarations and macro definitions to be shared between several source files.</p> <p>Include Syntax Both the user and the system header files are included using the preprocessing directive #include.</p> <p>‘main’ function main() function is the entry point of any C program. It is the point at which execution of program is started. Every C program have a main() function.</p>	<p><i>Correct description of structure 3M</i></p>
--	--	---	---



MAHARASHTRA STATE BOARD OF TECHNICAL EDUCATION
(Autonomous)
(ISO/IEC - 27001 - 2005 Certified)

SUMMER – 2019 EXAMINATION
MODEL ANSWER

Subject: Programming in C

Subject Code: 22226

	<p>(c)</p> <p>Ans.</p>	<p>Write a program to take input as a number and reverse it by while loop. <i>(Note: Any other correct logic shall be considered).</i></p> <pre>#include<stdio.h> #include<conio.h> void main() { int no; int sum=0,rem; printf("\n Enter number:"); scanf("%d",&no); while(no>0) { rem=no%10; no=no/10; sum=sum*10+rem; } printf("\nsum=%d",sum); getch(); }</pre>	<p>4M</p> <p><i>Accept input 1M</i></p> <p><i>Use of while loop 1M</i></p> <p><i>correct syntax 2M</i></p>
	<p>(d)</p> <p>Ans.</p>	<p>Write a program to accept 10 numbers in array and arrange them in ascending order. <i>(Note: Any other correct logic shall be considered).</i></p> <pre>#include<stdio.h> #include<conio.h> void main() { int arr[10],i,j,temp; clrscr(); printf("Enter array elements:"); for(i=0;i<10;i++) { scanf("%d",&arr[i]); } printf("\n\n Array elements are:"); for(i=0;i<10;i++) { printf("%d ",arr[i]); } }</pre>	<p>4M</p> <p><i>Correct logic 2M</i></p> <p><i>Correct syntax 2M</i></p>



MAHARASHTRA STATE BOARD OF TECHNICAL EDUCATION
(Autonomous)
(ISO/IEC - 27001 - 2005 Certified)

SUMMER – 2019 EXAMINATION
MODEL ANSWER

Subject: Programming in C

Subject Code: 22226

	<pre> } for(j=0;j<10;j++) { for(i=0;i<10;i++) { if(arr[i+1]<arr[i]) { temp=arr[i]; arr[i]=arr[i+1]; arr[i+1]=temp; } } } printf("\n\nArray elements in ascending order are:"); for(i=0;i<10;i++) { printf("%d ",arr[i]); } getch(); }</pre>	
(e)	Explain meaning of following statement with reference to pointers: int *a, b; b=20; *a=b; A=&b; int *a,b; It is declaration of integer pointer a and integer variable b b=20; value 20 is assigned to variable b. *a=b; Value of b is assigned to pointer a. A=&b; Address of b is assigned to variable A.	4M <i>Correct meaning of each statement 1M</i>



MAHARASHTRA STATE BOARD OF TECHNICAL EDUCATION
(Autonomous)
(ISO/IEC - 27001 - 2005 Certified)

SUMMER – 2019 EXAMINATION
MODEL ANSWER

Subject: Programming in C

Subject Code: 22226

5.	(a)	Attempt any TWO of the following: Write a program to perform addition, subtraction, multiplication and division of two integer number using function. (Note: Any other correct logic shall be considered).	12 6M
	Ans.	<pre>#include<stdio.h> #include<conio.h> void add(int x,int y) { printf("\nAddition=%d",x+y); } void sub(int x,int y) { printf("\nSubtraction=%d",x-y); } void mult(int x,int y) { printf("\nMultiplication=%d",x*y); } void div(int x,int y) { printf("\nDivision=%d",x/y); } void main() { intx,y; clrscr(); printf("Enter x:"); scanf("%d",&x); printf("Enter y:"); scanf("%d",&y); add(x,y); sub(x,y); mult(x,y); div(x,y); getch(); }</pre>	<i>Add function 1M</i> <i>sub function 1M</i> <i>Mult function 1M</i> <i>Div function 1M</i> <i>Main function 2M</i>
	(b)	Define Array. Write a program to accept ten numbers in array. Sort array element and display.	6M



MAHARASHTRA STATE BOARD OF TECHNICAL EDUCATION
(Autonomous)
(ISO/IEC - 27001 - 2005 Certified)

SUMMER – 2019 EXAMINATION
MODEL ANSWER

Subject: Programming in C

Subject Code: 22226

	Ans.	<p>Definition of Array: An array is a collection of data elements, all of the same type, accessed using a common name.</p> <p>Program: #include<stdio.h> #include<conio.h> void main() { int a[10],i,j,temp; clrscr(); printf("Enter numbers:"); for(i=0;i<10;i++) scanf("%d",&a[i]); for(i=0;i<10;i++) { for(j=i+1;j<10;j++) { if(a[i]>a[j]) { temp=a[i]; a[i]=a[j]; a[j]=temp; } } } printf("\n Sorted array elements:"); for(i=0;i<10;i++) printf("\n %d",a[i]); getch(); }</p>	<p><i>Array definition 1M</i></p> <p><i>Accepting array 1M</i></p> <p><i>Sorting logic 3M</i></p> <p><i>Display sorted array 1M</i></p>
	<p>(c)</p> <p>Ans.</p>	<p>Write a program to print reverse of a entered string using pointer. (Note: Any other correct logic shall be considered). #include<stdio.h> #include<conio.h> void main() {</p>	<p>4M</p>



MAHARASHTRA STATE BOARD OF TECHNICAL EDUCATION
(Autonomous)
(ISO/IEC - 27001 - 2005 Certified)

SUMMER – 2019 EXAMINATION
MODEL ANSWER

Subject: Programming in C

Subject Code: 22226

		<pre> char str[10], *ptr; int l=0; clrscr(); printf("Enter string:"); scanf("%s",str); ptr=str; while(*ptr!='\0') { l=l+1; ptr=ptr+1; } while(l>0) { ptr=ptr-1; printf("%c",*ptr); l=l-1; } getch(); } </pre>	<p><i>Acceptin g string 1M</i></p> <p><i>pointer initializa tion1M</i></p> <p><i>logic of reverse using pointer 3M</i></p> <p><i>Displayi ng reverse string 1M</i></p>
6.	<p>(a)</p> <p>Ans.</p>	<p>Attempt any TWO of the following:</p> <p>Explain recursion with suitable example. List any two advantages.</p> <p>Recursion means a function calls itself repetitively. A recursive function contains a function call to itself inside its body.</p> <p><i>Example:</i></p> <pre> #include<stdio.h> #include<conio.h> int factorial(int N); void main() { int N,fact; clrscr(); printf("Enter number:"); scanf("%d",&N); fact=factorial(N); </pre>	<p>12 6M</p> <p><i>Explana tion of recursio n 1M</i></p> <p><i>Example 3M</i></p>



MAHARASHTRA STATE BOARD OF TECHNICAL EDUCATION
(Autonomous)
(ISO/IEC - 27001 - 2005 Certified)

SUMMER – 2019 EXAMINATION
MODEL ANSWER

Subject: Programming in C

Subject Code: 22226

	<pre>printf("\n Factorial is:%d",fact); getch(); } int factorial(int N) { if(N==1) return(1); else return(N*factorial(N-1)); }</pre> <p>Advantages:</p> <ul style="list-style-type: none">• Reduces length of the program• Reduces unnecessary calling of a function.• Useful when same solution is to be applied many times.	<p><i>Any two Advantages 2M</i></p>
<p>(b) Ans.</p>	<p>Write a program to accept ten numbers and print average of it. <i>(Note: Program without array shall be considered).</i></p> <pre>#include<stdio.h> #include<conio.h> void main() { int a[10],i,sum=0; float avg; clrscr(); printf("Enter numbers:"); for(i=0;i<10;i++) scanf("%d",&a[i]); for(i=0;i<10;i++) sum=sum+a[i]; avg=sum/10; printf("\n Average =%f", avg); getch(); }</pre>	<p>6M</p> <p><i>Accepting 10 numbers 2M</i></p> <p><i>Calculating average 2M</i></p> <p><i>Displaying average 2M</i></p>
<p>(c) Ans.</p>	<p>Enlist different format specifiers with its use.</p> <p>Format specifier tells the compiler what type of data a variable holds during taking input and printing output using scanf() and printf() functions respectively.</p> <p>Format specifiers used in C programming:</p>	<p>6M</p>



MAHARASHTRA STATE BOARD OF TECHNICAL EDUCATION
(Autonomous)
(ISO/IEC - 27001 - 2005 Certified)

SUMMER – 2019 EXAMINATION
MODEL ANSWER

Subject: Programming in C

Subject Code: 22226

Format specifier	Use	<i>Any six format specifiers with use 1M each</i>
%d	Specify data type as short signed	
%u	Specify data type as short unsigned	
%ld	Specify data type as long signed	
%lu	Specify data type as long unsigned	
%x	Specify data type as unsigned hexadecimal	
%o	Specify data type as unsigned octal	
%f	Specify data type as float	
%lf	Specify data type as double	
%Lf	Specify data type as long double	
%c	Specify data type as signed character	
%s	Specify data type as unsigned group of characters(Strings)	