

TECNIA INSTITUTE OF ADVANCED STUDIES

NAAC Accredited Grade 'A' Institute

Department of Information, Communication & Technology
BACHELOR OF COMPUTER APPLICATIONS - BCA

Ref. No. TIAS/BCA/2021-22/120

Dated: 01.12.2021

-: Model Question Paper:-

Course: Programming for Problem solving (ESC 103)

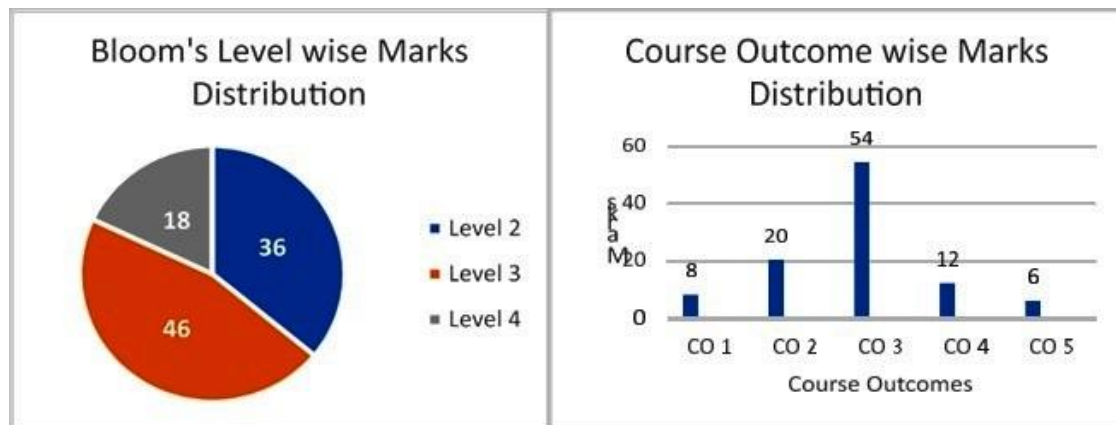
Maximum Marks: 100; Duration: 03 hours

Q. No	Questions	Marks	CO	BL	PI
1(a)	Explain the steps involved in solving a problem using computer.	08	CO1	L2	1.4.1
1(b)	Write an algorithm to find roots of a quadratic equation $ax^2 + bx + c = 0$ reading the values of a, b and c.	12	CO2	L3	1.4.1
2(a)	Compare if-else-if and switch statement giving examples for their relevant use.	08	CO2	L2	1.4.1
2b	Write a C program that reads a given integer number and checks whether it is a palindrome. A palindrome is a number that has same value even when it is reversed. Eg: 12321 is a palindrome.	12	CO3	L3	1.4.1
3a	Compare the working of three looping constructs of C language giving their syntax.	08	CO3	L2	1.4.1
3b	What does the following program do? <pre>#include <stdio.h> int main() { char ch; int vcnt = 0, ccnt=0; for (ch = getchar(); ch != '\n'; ch=getchar()){ if(ch=='a' ch=='e' ch=='i' ch=='o' ch=='u' ch=='A' ch=='E' ch=='I' ch=='O' ch=='U') vcnt++; else if((ch >= 'a' && ch <= 'z') (ch >= 'A' && ch <= 'Z')) ccnt++; } printf(" %d %d\n", vcnt, ccnt); }</pre> Rewrite the above program using while and switch constructs.	12	CO4	L4	1.4.1
4a	Compare call by value and call by reference with relevant examples.	8	CO3	L2	1.4.1
4b	Write a C function to find the largest and smallest in a given list of integers of size n using call by reference: void min max (int list[], int n, int *min, int *max);	12	CO3	L3	1.4.1
5a	Explain at least four file handling operations available in C language giving their syntax.	4	CO3	L2	1.4.1
5b	Identify the bug in the following function written to return the swapped values of two integer variables given: <pre>int swap(int *x, int *y) { int *temp; temp = x, x=y, y = temp; }</pre>	6	CO5	L4	1.4.1
5c	Define a structure to store time with three components hours, mins and seconds. Write a modular C program to compute the time taken by an athlete to complete a marathon reading the start and end time of his run.	10	CO3	L3	1.4.1

BL - Bloom's Taxonomy Levels (1- Remembering, 2- Understanding, 3 - Applying, 4 - Analyzing, 5 - Evaluating, 6 - Creating)

CO - Course Outcomes

PO - Program Outcomes; PI Code - Performance Indicator Code



MODEL QUESTION PAPER FOR END SEMESTER EXAMINATION

Course Name: Programming for Problem Solving
Duration: 3 hrs. ; Max. Marks: 100

Instructions:

- Attempt five questions selecting ONE from each section. Question 9 (Section E) is compulsory.
- All the questions carry equal marks.
- Draw neat diagrams wherever applicable.

Q. No	Question	Marks	BL	CO	PO	PI Code
Section-A						
1.	a) What is an algorithm? Explain the characteristics of an algorithm.	2+6	1,2	2	1	1.4.1
	b) Write an algorithm to find angle between hour and minute hands of a clock at a given time.	7	3	3	1	1.4.1
	c) Is it mandatory to declare main () function with return type as void or int. What will be the effect if there is no return type declared for main () function?	3+2	4	3	1	1.4.1
OR						
2.	a) What is the difference between definition and declaration in C? When a user writes "int x;" is it treated as declaration or definition in C.	3+2	2,4	3	1	1.4.1
	b) Write a program in C to find largest of 3 positive integer numbers using conditional operators.	7	3	3	1,2	1.4.1, 2.2.4
	c) What is meant by iterative statements? What are the different types of iterative statements in C?	8	1,2	3	1	1.4.1
Section-B						
3.	a) Bob has placed N objects in a row which are marked with a number equal to their weight in Kg. He wants to check whether the objects are in increasing order of their weights or not. Write a C program to help Bob.	12	3	3,6,7	1,2	1.4.1, 2.2.4
	b) Differentiate between Big-O and Big-Omega notation.	4	2	3	1	1.4.1
	c) What is the role of index in an array? How are the elements of a 2D array accessed in C?	2+2	2	3	1	1.4.1
OR						
4.	a) Ram is conducting a study which is based on counting the number of cars crossing the highway. Every hour he generates a random string containing sequence of characters <rbwbr...>, where r represents red color, w denotes white color and b denotes blue color cars. The string is forwarded to Shyam for analysis who computes the number of red, blue and white color cars crossing Ram every hour. Assume that Ram works for 5 hours in a day, help Shyam generate a daily report containing the following: i. Total number of different colour cars crossing Ram in an hour. ii. Total number of different colour cars crossing Ram in a day. iii. Total number of cars crossing Ram in a day.	4+4+4	3	3,6,7	1,2	1.4.1, 2.2.4
	b) What is a variable? Explain the ways to declare scope of a variable.	2+6	1,2	3	1	1.4.1
Section-C						
5.	a) Write a program which will read positive integer numbers from the users and compute the sum if the number can be expressed as power of 2. The test whether a number can be expressed as power of 2 will be done using a function power_of_two(int a).	12	3	3,6,7	1,2	1.4.1
	b) What is recursion? Differentiate between homogeneous and heterogeneous recursion with the help of an example.	2+3+3	2	3	1	1.4.1
OR						

6.	a) What are the different ways to pass parameters to a function? Explain with the help of a suitable example.	4+4	2	3,5	1	1.4.1
	b) b. Is it possible to return multiple values from a function? Justify the statement with the help of an example.	4+8	3	3,6,7	1,2	1.4.1
Section-D						
7.	a) What is a structure? What is the benefit offered by using a structure over multiple arrays?	2+6	2	5	1	1.4.1
	b) b. Ram is working on a project which requires returning multiple values from a function. He observed that a return statement can only be used to return a single value from a function. How the function should be implemented so that multiple values can be returned by Ram?	12	4	5	1	1.4.1
OR						
8.	a) Write a program that reads a number as input from the user. The entered number is written to a file "even.txt" if the input is even else it is written to "odd.txt". Write a C code to perform the desired task.	12	3	5	1	1.4.1
	b) b. What are the different methods to open a file? Explain each with the help of a C program.	3+5	2	5	1	1.4.1
Section-E (Compulsory Question)						
9.	a) What is a compiler? List names of any 2 compilers.	2 ½	1	1	1	1.4.1
	b) What are the benefits of designing a flowchart for solving a problem?	2 ½	4	2	1	1.4.1
	c) What is the output of the following code? <pre>int main(){ int x=10; int y=sizeof(x/2); printf("%d",y); }</pre>	2 ½	3	4	1	1.4.1
	d) What is the difference between creating constant using #define macro and const keyword?	2 ½	3	3	1	1.4.1
	e) What is the role of function prototype? When is it required in C?	2 ½	2	3	1	1.4.1
	f) Which of the following are unary operators in C? State reason for your answer. a. ! b. sizeof c. ~ d. &&	2 ½	2	3	1	1.4.1
	g) Which of the following special symbol allowed in a variable name? State reason for your answer. a. * (asterisk) b. (pipeline) c. - (hyphen) d. _ (underscore)	2 ½	2	3	1	1.4.1
	h) In which header file is the NULL macro defined? State reason for your answer. a. stdio.h b. stddef.h c. stdio.h and stddef.h d. math.h	2 ½	2	3	1	1.4.1

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MODEL QUESTION PAPER
Total Duration (H:M): 3:00

Course : Basic Electrical Engineering (ESC101)
 Maximum Marks :100

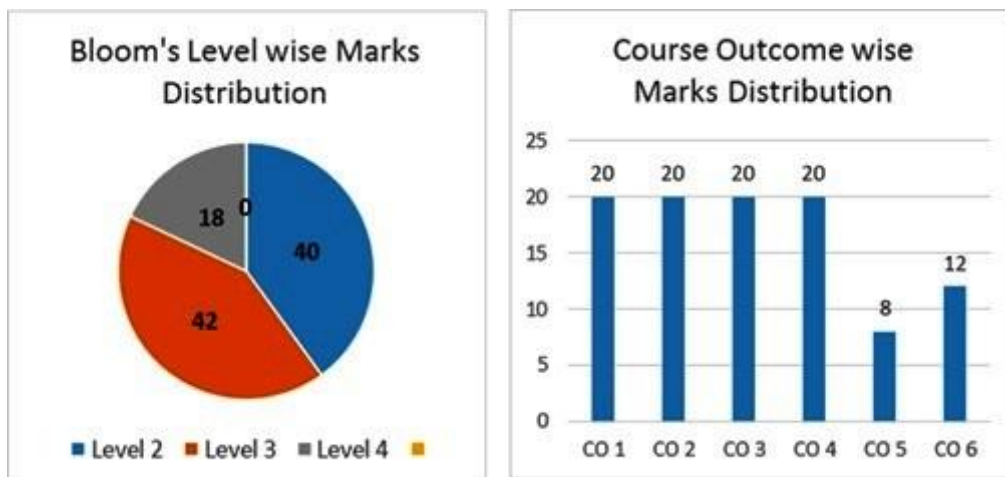
Q. No	Questions	Marks	CO	BL	PI
1(a)	<p>Calculate current through $4\ \Omega$ resistor using Kirchoff's Laws? Verify the same using Superposition Theorem.</p>	12	CO1	L3	1.3.1
1(b)	Derive the expression for the transient current in a series 'R-L' circuit when a 'dc' voltage of V volts is applied. Sketch time variation of current in the circuit.	8	CO1	L2	1.3.1
2(a)	<p>Two impedances $Z_1=15+j12\ \Omega$ and $Z_2=8-j5\ \Omega$ are connected in parallel. If the potential difference across one of the impedance is 250 V, calculate</p> <ol style="list-style-type: none"> total current and branch currents total power and power consumed in each branch overall p.f. draw the phasor diagram 	12	CO2	L3	1.3.1
2b	It is desired to operate a 100 W, 120 V, electric bulb at its rated current on a 240 V, 50 Hz supply. The simplest arrangement is to use either (a) a resistor, or (b) a capacitor or (c) an inductor having $10\ \Omega$ resistance in series with the electric bulb so as to drop the excess voltage. Determine the value of the component used, the total power consumed and the power factor in each case. Giving reasons, state which alternative is the best.	8	CO2	L4	1.3.1
3a	A single phase 25 kVA 1000/2000 V, 50 Hz transformer has maximum efficiency of 98% at full load upf. Determine its efficiency at, (a) $3/4$ th full load, unity power factor (b) $3/4$ th full load 0.8 power factor	12	CO3	L3	1.3.1
3b	Explain the working of a practical transformer with relevant phasor diagram and define voltage regulation.	8	CO3	L2	1.3.1
4a	A two pole 3 phase 50 Hz induction motor is running on load with a slip of 4%. Calculate the actual speed and the synchronous speed of the machine. Sketch the speed/ load characteristic of the machine.	8	CO4	L2	1.3.1
4b	A wireless battery powered drilling machine operates on 24 V DC with constant speed and negligible field current. Initially when the machine is powered it runs at 1200 rpm and draws 0.5 A from the battery. Further when the drill bit starts drilling the hole, the speed reduces to 1120 rpm. Determine power requirement from the battery for drilling if the resistance of the armature is $0.2\ \Omega$. What is the power drawn initially?	12	CO4	L4	1.3.1
5a	Explain the working principle of a single phase pulse width modulated voltage source inverter with relevant circuit diagram and draw the output voltage wave form.	8	CO5	L2	1.3.1
5b	To protect an expensive circuit component from being delivered too much power, you decide to incorporate a fast blowing fuse into the design. Knowing that the circuit component is connected to 12 V, its minimum power consumption is 12 watts and the maximum power it can safely dissipate is 100 watts, which of the three available fuse ratings should you select: 1A , 4A or 10 A? Give reasons.	6	CO6	L4	1.3.1

5c	Calculate the i) ampere-hour and ii) watt-hour efficiency of a secondary cell which is discharged at a uniform rate of 30 A for 6 hours at an average terminal voltage of 2 V. It is then charged at a uniform rate of 40 A for 5 hours to restore it to its original condition. The terminal voltage during charging is 2.5 V.	6	CO6	L3	1.3.1
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