Amrita Vishwa Vidyapeetham

Amrita School of Engineering, Amaravati

B. Tech Mid-term Examinations – November 2024

1st Semester

Computers and Communication Engineering

23CCE101 - Problem Solving and Algorithmic Thinking

Duration: Two hours

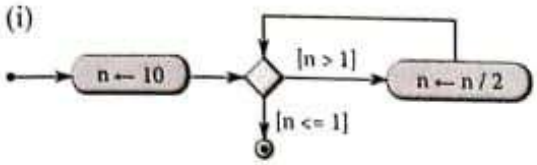
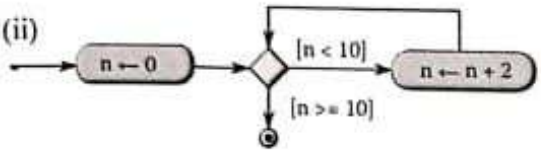
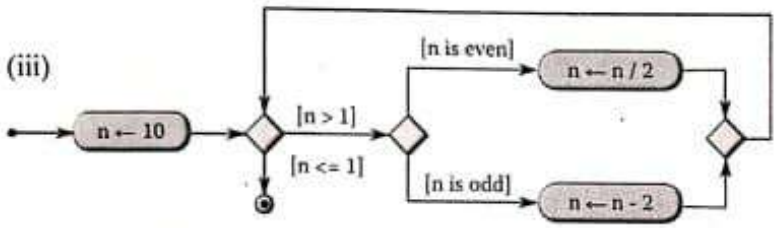
Maximum: 50 Marks

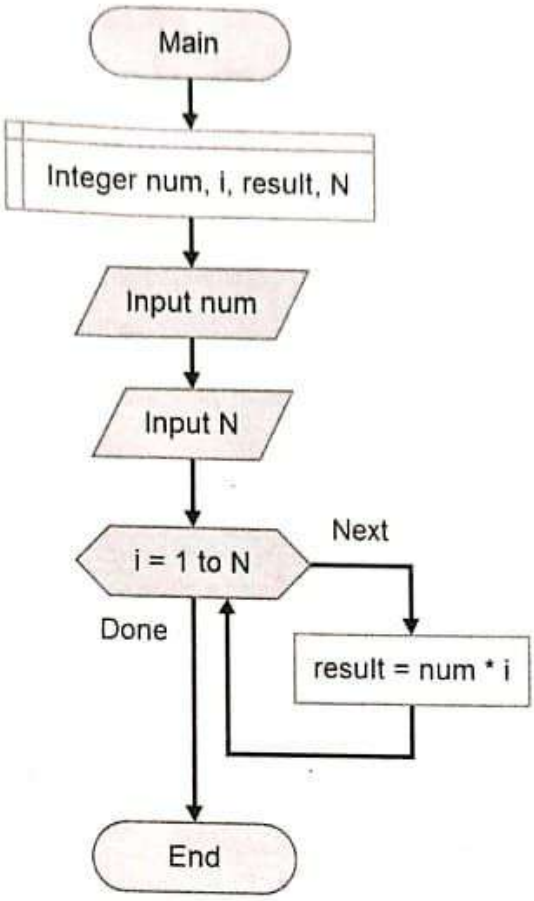
Course Outcomes (COs):

CO	Course Outcomes
CO01	Understand the concepts of computational logic
CO02	Develop algorithmic thinking
CO03	Identify algorithms and their suitability
CO04	Apply algorithms to solve a problem

Answer all the questions

Q#	Questions	Marks	CO	BTL
1	a) Write the differences between while and do-while loops?	3	1	1
	b) What is the difference between algorithms and program?	3	2	1
	c) What is a flowchart, and why is it used in problem-solving?	3	2	2
2	a) What is an array and explain with suitable example.	2	1	2
	b) Write an expression in an algorithm that calculates the total price of items in a shopping cart, including taxes and discounts?	3	2	3
	c) Write a logic to check whether a number is within the range **[30, 50]** using relational and logical operators.	3	2	3
	d) Draw a truth table for the following Boolean expressions: (i) (A && B) || (!B) (ii) (A || B) && (!A)	4	1	3
3	Explain the concept of modularization in problem-solving and draw a flowchart to calculate the area of different shapes using separate modular functions for each shape.	10	4	4

4	a) Define selection, repetition and sequence. b) For each of the following flowcharts, list each action that the computer takes and indicate the computational state that follows from each action. (i)  (ii)  (iii)  	6	4	4
5	a) Define computational thinking and discuss the cornerstones of computational thinking.	5	1	1
	b) Predict the output produced by the Flowgorithm when '**num**' is set to 25 and '**N**' is set to 8, and write the step-by-step execution. Also, provide the name of the logic that generates the predicted output.	5	3	4



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Course Outcome /Bloom's Taxonomy Level (BTL) Mark Distribution Table

CO	Marks	BTL	Marks
CO01	**17**	BTL 1	**14**
CO02	**12**	BTL 2	**05**
CO03	**05**	BTL 3	**10**
CO04	**16**	BTL 4	**21**