Programme: BE (CSE)
Course Name: Software Engineering
Maximum Marks: 30

Year/Semester: 5th Semester
Course Code: CSN 302
Time Allowed: 1.5 Hours

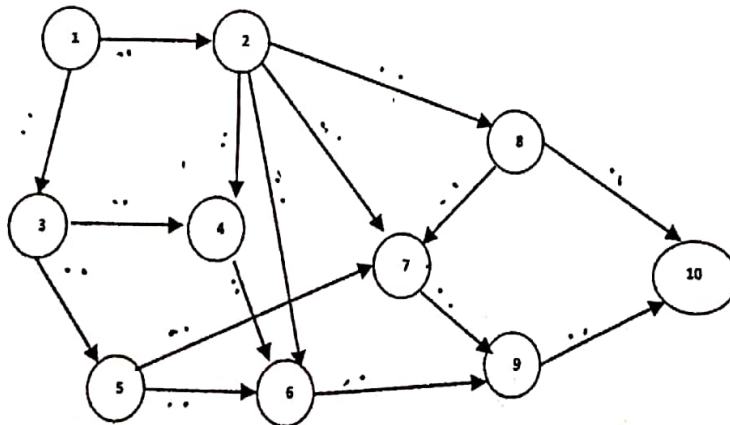**Notes:**

Naman Mittal   17103103

- All questions are compulsory
- The candidates, before starting to write the solutions, should please check the question paper for any discrepancy, and also ensure that they have been delivered the question paper of right course code.

1.a) A technical lead is working on an iterative lifecycle project that is creating a well-understood application using a technology the team has experience with. The project has 10 major use cases to implement; two have just been delivered on schedule in the first iteration. At the request of the project manager, who is concerned about the amount of effort being spent fixing defects, the lead has collected some data on quality performance during the first iteration. The data shows that planned reviews for requirements and design are not occurring. It shows that 22 defects are being detected during unit and system testing per 100 SLOC. The lead is asked to predict the defect trend for the project going forward. As the technical lead what will be your prediction and why?   (05)

b) A software firm has just signed a contract to deliver an inventory tracking/on-line transaction system for use by 800 entry clerks in the contract. The client has demanded a schedule of rigorous checkpoints but the requirements for the project are poorly defined. Which of the development process model would be most suitable and why?   (05)

2.a) What is meant by software process maturity? How software process maturity can be assessed?   (07)

b) Compare and contrast Rapid Application Development (RAD) and Agile Development models for software development. You may consider suitability for type of software projects, Software teams etc. as comparison attributes.   (07)

3. Find McCabe's cyclomatic complexity for the following control flow graph only with predicate node method: (06)

PEC
EXPLORE INNOVATE EXCEL

PUNJAB ENGINEERING COLLEGE
(DEEMED TO BE UNIVERSITY)
Mid-Semester Examination
September, 2019

Programme: B.E

Course Name: **WEB TECHNOLOGIES**

Maximum Marks: 30

Year/Semester: **2019/5**[th]

Course Code: **CSN303**

Time allowed: **1.5 hrs.**

Naman Mittal

17103103

Notes:

- All questions are compulsory.
- Unless stated otherwise, the symbols have their usual meanings in context with the subject. Assume suitably and state, additional data required, if any.
- The candidates, before starting to write the solutions, should please check the question paper for any discrepancy, and also ensure that they have been delivered the question paper of right course code.

Q1.(a)	Consider the following method:
	
	``java
	public static void arrayMystery(String[] a) {
	for (int i = 0; i < a.length; i++) {
	a[i] = a[i] + a[a.length - 1 - i];} }
	``
	
	What values would be stored in the array after the method arrayMystery executes each time, if the array below is passed as a parameter to it. Explain your answer in not more than <u>five</u> lines.
	
	``java
	String[] a1 = {"a", "b", "c"};
	arrayMystery(a1);
	
	String[] a2 = {"a", "bb", "c", "dd"};
	arrayMystery(a2);
	
	String[] a3 = {"z", "y", "142", "w", "xx"};
	arrayMystery(a3);
	``
		[6]

Q1.(b)	Consider the following code:
	
	``java
	public class AnimalFarm {
	public static void main(String[] args) {
	  String pig = "length: 10";
	  String dog = "length: " + "10";
	  String cat = "length: " + pig.length();
	System.out.println("Animals are equal: "+ (pig == dog));
	System.out.println("Some animals are equal: "+ (pig == cat));
	System.out.println("Animals are equal: "+ (pig.equals(dog)));
	System.out.println("Some Animals are equal: "+ (pig.equals(cat)));
	
	} }
	``
	
	What will be the output of the above code? Explain each output in not more than <u>one</u> line.
		[4]

Q2. (a)	TinyURL is a URL shortening web service, which provides short aliases for redirection of long URLs. A web crawler during the processing of URLs on a webpage may encounter a tiny URL. Describe how the tiny URLs can be handled by a web crawler program so that it does not violate the condition of moving out of the domain of parent or seed URL. You can explain your answer in the form of an algorithm or bullet points or flow diagram or program.	[5]

	An example: https://www.netflix.com/signup?action=startAction&locale=en-IN *into this TinyURL:* https://tinyurl.com/y73kyr5o	
Q2.(b)	*"You have decided to go see a movie and grab a bite to eat afterward. You are in the mood for a comedy and some incredibly spicy Indian food. Booting up your PC, you open a web browser and head to Google to search for theater, movie and restaurant information. You need to know which movies are playing in the theaters near you, so you spend some time reading short descriptions of each film before making your choice. Also, you want to see which Indian restaurants are close to each of these theaters. And, you may want to check for customer reviews for the restaurants. In total, you visit half a dozen Web sites before you're ready to head out the door."* ƺ.⦁ Which version of the web will be most suitable to implement the above mentioned scenario? How this version of web is different from its ancestors.	[6]
Q3.(a)	*"Arguing that Java is better than C++ is like arguing that grasshoppers taste better than tree bark."* List three features that make Java better than C++ in your point of view.	[3]
Q3. (b)	Although `if-else` and `switch` are multi-way branch statements, they are not completely same. Out of `if-else` and `Switch`, which one is fast and why?	[3]
Q3. (c)	A *for loop* repeats until a specified condition evaluates to false whereas the *for-each loop* executes a provided function once for each array element. Give an example that can be solved only by using *for loop* and not by using *for-each loop*. (You are supposed to write the Java code.)	[3]
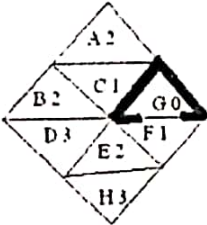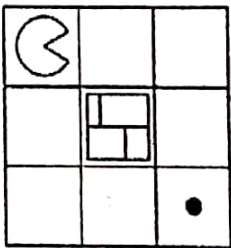
Programme: B.Tech. (CSE)
Course Name: Artificial Intelligence
Maximum Marks: 35

Naman 17103103

Year/Semester: 3rd year/19201
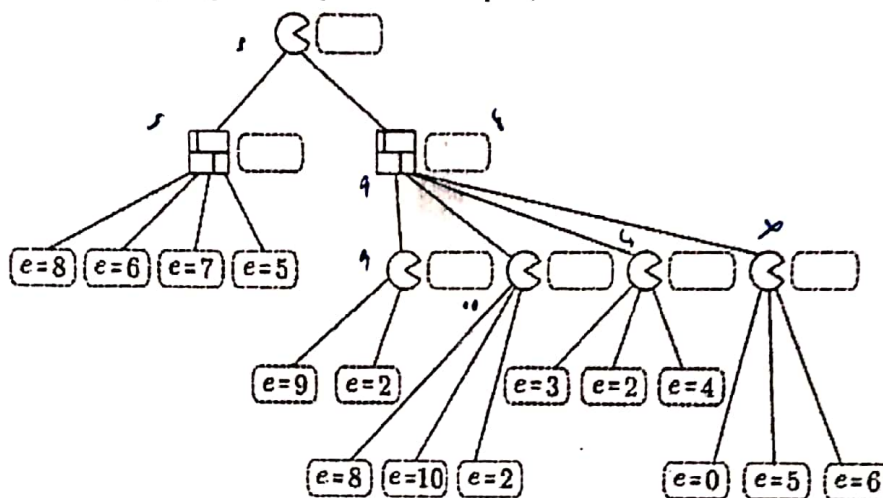**Course Code:** CSN305
Time: 1 Hr 30 Minutes

Notes:
- All questions are compulsory.
- Unless stated otherwise, the symbols have their usual meanings in context with subject. Assume suitably and state, additional data required, if any.

Q. No.		Marks
1.	Consider the tic-tac-toe problem to answer following: a. Give the PEAS description for the starting player. b. How does it differ from the PEAS description of the other player? c. Classify the problem task environment according to the properties: Fully observable /partially observable, Deterministic /stochastic, Episodic /sequential, Static /dynamic /semi-dynamic, Discrete /continuous. d. Give the formal problem definition in terms of: states, initial state, valid moves, goal test, path cost.	1+1+2+2
2.	Consider the following path-finding problem. One can move from one small triangle to another if they share a vertex (e.g., A can go to B and C). However, the goal G can only be accessed from F. The number after the letter is the heuristic function value for that state. The actual cost of each move is as follows: • A move down one level (e.g. $A \rightarrow C$ or $B \rightarrow E$) costs 1 • A move sideways on the same level (e.g. $C \rightarrow B$ or $E \rightarrow F$) costs 2 • A move up one level (e.g. $B \rightarrow A$ or $C \rightarrow A$) costs 3 a. Perform Depth-First Search, starting from A, avoid repeated states if they occur on the path back to the root in the search tree. Expand successors in alphabetical order. Show your search tree, and circle states that are expanded. What is the cost of your solution path? b. Perform A* Search, starting from A. Break ties alphabetically. Show the expanded states and the priority queue contents at each step. What is the cost of your solution path?	3+3
3.	In the game of Surrealist Pacman, Pacman plays against a moving wall. On Pacman's turn, Pacman must move in one of the four cardinal directions, and must move into an unoccupied square. On the wall's turn, the wall must move in one of the four cardinal directions, and must move into an unoccupied square. The wall cannot move into a dot-containing square. Staying still is not allowed by either player. Pacman's score is always equal to the number of dots he has eaten. The first game begins in the configuration shown below. Pacman moves first, therefore, it is considered as MAX node. a. Draw a game tree with one move for each player. Draw only the legal moves.	1+1+1+2+5

(b) According to the depth-limited game tree you drew above what is the value of the game? Use Pacman's score as your evaluation function.

(c) If we are to consider a game tree with ten moves for each player (rather than just one), what would be the value of the game as computed by minimax?

(d) A second game is played on a more complicated board. A partial game tree is drawn, and leaf nodes have been scored using an (unknown) evaluation function e.

    i. In the dashed boxes, fill in the values of all internal nodes using the minimax algorithm.

    ii. Identify the nodes that are not evaluated when using alpha-beta pruning. Clearly mention alpha, beta values at each node traversed.

4. You have three jugs measuring 12 litres, 8 litres, & 3 litres, and a water faucet. You need to measure out exactly one litre. Use state space approach to solve this problem.	4
5. Consider following sentences: All people who are not poor and are smart are happy. Those people who read are smart. John can read and is not poor. Happy people have exciting lives. Can anyone be found with an exciting life? Following predicates are given (Use quantifiers wherever applicable). Poor(x): x is poor. Smart(x): x is smart. Happy(x): x is happy. Reads(x): x can read. HasExcitingLife(x): x has exciting life. Use resolution with refutation to answer "Who has an exciting life?".	6
6. In knowledge representation, how important relationships that exist among attributes of objects is handled?	3

Punjab Engineering College, Chandigarh
(DEEMED UNIVERSITY)
Mid Semester Examination (Sept 27, 2019)

Subject: Theory Computation   Max marks--25

Branch: CS V Sem   Time—1.5 hour

Paper Code: CSN-301

NOTE—Attempt all questions.   17103103   *Naman Mittal*

1. Construct a DFA for the Language over alphabet {a, b} recognizing the set of all strings such that every block of five consecutive symbols contains at least two 'a'.   [5]

   (3 marks for construction 2 for explanation)

2. Write a regular expression for the DFA (in table) using Arden's Theorem   [3]

δ	0	1
$\rightarrow q_1$	q_1	q_2
q_2	q_3	q_2
q_3	q_1	q_4
$^*q_4$	q_1	q_2

3. State Pumping lemma and prove that the language $L = \{a^n b^k c^{n+k}: n \geq 0, k \geq 0\}$ is not regular.   [1+2].

4. Show that Regular languages are closed with respect to intersection operation.   [5]

5. Define the relation "equivalent states" in set of states of Finite Automation and prove that this relation is an equivalence relation.   [3]

6. What is the Chomsky's classification of grammars (write general form of productions only, with an example set of production of each class)?   [3]

7. Write a regular expression for all words over {a, b} that have   [3]
   a. At least one 'a' and one 'b'.
   b. 'a' appears in integer multiple of 3(three) if it appears.
   c. With exactly two 'a's OR two 'b's.

Punjab Engineering College
Mid-Term Examination

Programme: CSE BE 3rd year

Course Name: Computer Graphics

Maximum Marks: 30

All questions are compulsory.

Year/Semester:BE 3rd year

Course Code: CSN 304

Time allowed: 90 mins

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17|03|03   Naman Mittal

	Questions	Marks
Q1)	Discuss briefly the contribution of graphics in the field of scientific visualization.	(5)
Q2)	Show that two successive reflections about x axis is equivalent to single rotation in xy plane about coordinate origin	(5)
Q3)	Derive decision parameters for midpoint ellipse algorithm assuming the start position is On x axis and points are to be generated along the curve path in counterclockwise order.	(8)
Q4)	A rectangular clipping window is defined by coordinates (0,0) for left bottom corner and (5,4) for the right top corner. Given two line segments: Line AB (from A(-1,-1) to B(6,6) Line CD(from C(-1,1) to D(4,-3) What is the sequence of bitcodes generated by the Cohen Sutherland Clipping algorithm when run on lines AB and CD. Give the final result after clipping.	(8)
Q5)	A point (4,3) is rotated counterclockwise by an angle of 45 degrees. Find the resultant point	(4)