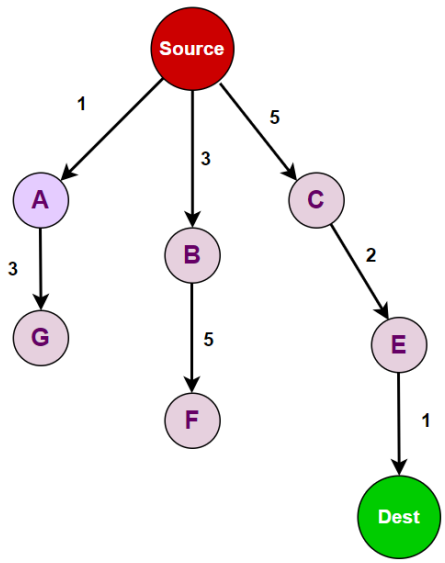
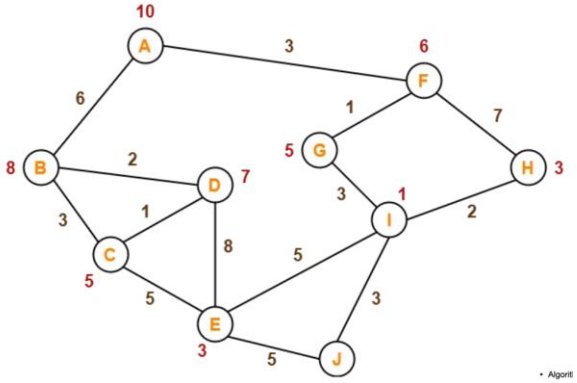
VII Semester BTech Examination DEC 2023	Set No.: 01
Course name: PE-III Artificial Intelligence (CSE)	Course code: CSE 4053

Q. No.	Description	Marks	Course Outcome (1-5)	Competency Levels (1-6)
1A	Deduce the components of technique used for specifying the task environment of an agent. Specify the task environment for i. A taxi driver. ii. Interactive English tutor iii. Medical diagnosis system	**5**	**CO1**	**4**
1B	Identify the agent that selects actions on the basis of the current percept, ignoring the rest of the percept history and elaborate with neat block diagram.	**3**	**CO1**	**2**
1C	Elaborate the structure or architecture of an agent.	**2**	**CO1**	**2**
2A	Categorize the generic approaches of AI and state an application for each of the approaches.	**5**	**CO1**	**4**
2B	Find the path using Uniform Cost Search from Source to Destination using graph search strategy for the graph in below figure. Show the result in steps showing each iteration as a tree and display the Frontier and Explored sets for each step. Frontier list should be shown as pair of <node, cumulative cost of the path from root to the node>.  	**3**	**CO2**	**3**
2C	Formulate the standard 8 puzzle problem. The 8-puzzle, consists of a 3×3 board with eight numbered tiles and a blank space. A tile adjacent to the blank space can slide into the space. The object is to reach a specified goal state.	**2**	**CO2**	**6**

3A	Comment the differences between informed search and uninformed search algorithm. Apply A* on the following diagram with steps beginning from node S to goal node G. The heuristic values are mentioned above each node and numbers written on edges represent the distance between the nodes. 	**5**	**CO2**	**3**
3B	State the mini-max search algorithm to solve 2 player game problem. Briefly discuss the performance analysis of the algorithm.	**3**	**CO3**	**2**
3C	"Quantifiers express the properties of the entire collection of objects". Demonstrate the quantifying techniques with examples for each.	**2**	**CO4**	**6**
4A	What is Alpha-Beta pruning? How does α-pruning improve the efficiency of the Minimax technique? Show using an example.	**5**	**CO3**	**3**
4B	Devise First order logic using consistent vocabulary for the given statements: i. Every student who takes Physics also takes Maths ii. No student failed Chemistry but atleast one student failed Maths. iii. Only one student failed Maths	**3**	**CO4**	**6**
4C	Consider the following sentence: **"if it is winter, then it will be cool."** Formulate the atomic sentences from the given sentence and represent the syntax and semantics of the propositional logic. Mention the premise of the logic created.	**2**	**CO4**	**6**
5A	State the Bayes rule and apply the same in the given scenario. In a neighborhood, 90% children were falling sick due to flu and 10% due to measles and no other disease. The probability of observing rashes for measles is 0.95 and for flu is 0.08. If a child develops rashes, find the child's probability of having	**5**	**CO5**	**3**

	flu.			
5B	Find the set of proposition symbols, syntax and semantics of the logic to represent the below given statement. "The car is either at John's house or at Fred's house. If the car is not at John's house, then it must be at Fred's house". Using truth table approach, determine where the car is?	**3**	**CO4**	**3**
5C	Demonstrate the systems designed for organizing and reasoning with categories.	**2**	**CO5**	**2**

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*** This format is to be used only for e-pad exam question paper**