Sample Question Format

KIIT Deemed to be University
Online Mid Semester Examination(Spring Semester-2021)

Subject Name & Code: Artificial Intelligence (CS-3011)
Applicable to Courses: IT

Full Marks=20 **Time:1 Hour**

SECTION-A(Answer All Questions. All questions carry 2 Marks)

Time:20 Minutes **(5×2=10 Marks)**

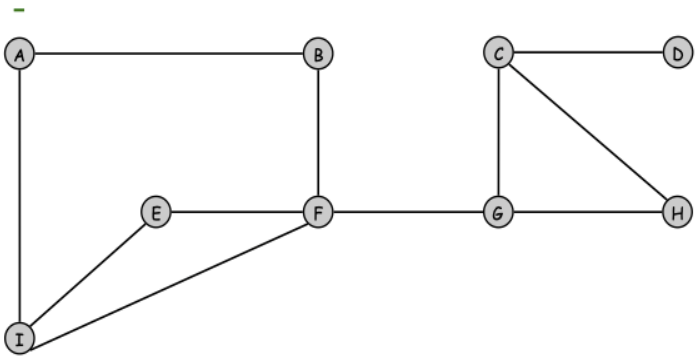
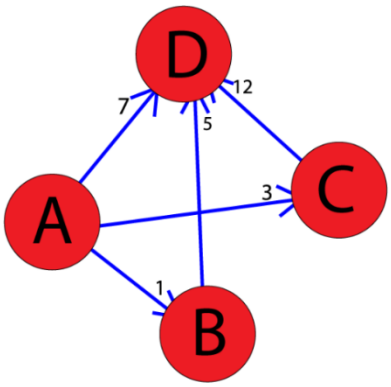
Question No	Question Type(MCQ/SAT)	Question	Answer Key(if MCQ)	CO Mapping
Q.No:1 (a)	SAT	What are the various disciplines that AI is founded on?		CO1
	SAT	What are the four approaches to define AI?		CO1
	SAT	What are the six capabilities for a computer to qualify the Turing test?		CO1
	SAT	Mention six state-of-the-art applications of AI.		CO1
Q.No:1 (b)	MCQ	Which agent deals with the happy and unhappy states? A. Utility-based agent B. Model-based agent C. Goal-based Agent D. Learning Agent	A	CO2
	MCQ	Which one of the given elements improves the performance of AI agent to help it take better decisions? A. Critic element B. Performance element C. Learning element D. Problem generator element	C	CO2
	MCQ	The action of the Simple reflex agent completely depends upon A. Percept history B. Current percept C. Learning theory D. Utility function	B	CO2
	MCQ	Which of the following is not a component of the task environment? A. Sensors B. Actuators C. Performance Measures D.Agent functions	D	CO2
Q.No:1 (c)	SAT	Differentiate between rational agent and omniscient agent.		CO2
	SAT	Differentiate between deterministic and stochastic task environments with examples.		CO2

	SAT	Differentiate between goal-based agent and utility based agent.		CO2
	SAT	What is the difference between agent function and agent program?		CO2
Q.No:1 (d)	**SAT**	Differentiate between Informed search & Uninformed search. Give examples of each category.		CO3
	SAT	What is a heuristic function in problem solving searching algorithms? In which type of algorithms is it used?		CO3
	SAT	What is the basic difference between Greedy Best First search and A* search algorithms?		CO3
	SAT	What is Uniform cost search? How is it different from Breadth first search?		CO3
Q.No:1 (e)	**MCQ**	Which search strategy is preferred when a solution is required with best space and time complexity possible? A. Depth First search B. Breadth First search C. Iterative Deepening search D. Depth limited search	C	CO3
	MCQ	Which search takes least memory? A. Depth First search B. Breadth First search C. A* search D. Uniform cost search	A	CO3
	MCQ	Which statement is valid for the Heuristic function? A. The heuristic function gives exact information. B. The heuristic function takes string parameters and returns integers. C. The heuristic function does not have any return type. D. The heuristic function estimates the cost of the best path between a given pair of states.	D	CO3
	MCQ	What is the condition for optimality for Breadth-first search? A. When there is less number of nodes B. When all step costs are equal C. When all step costs are unequal D.When there is a looping path	B	CO3

SECTION-B(Answer Any One Question. Each Question carries 10 Marks)

Time: 30 Minutes **(1×10=10 Marks)**

Question No	Question	CO Mapping
Q.No:2	What is task environment? How is it represented?For each of the following agents, provide a PEAS description of the task environment - (i). Automated taxi driver	CO2

	(ii). Part-picking robot (iii). Interactive English tutor (iv). Voice-based Google assistant for smartphone (v). Mars rover	
Q.No:3	Discuss the working of BFS search algorithm. Mention its properties. Show the working of BFS on the given problem where the starting node is A and the goal node is G. 	CO3
Q.No:4	Explain the five components of problem formulation for a problem-solving agent. What is state-space? Formulate each of the following problems by stating these five components: (i). 8-puzzle (sliding tile) problem (ii). 8-queen problem (iii). Route finding problem for airlines (iv). Vacuum world (v). Automatic crossword solver	CO3
Q.No:5	Explain briefly six properties of environments for agents. In a tabular manner, characterize in terms of these properties the environments for the following agents: (i). Chess playing agent (ii). Automated Taxi driving agent (iii). Satellite Image Analysis system (iv). Virtual ticket booking agent (v). Automated chat bot	CO2
Q.No:6	What are four basic kinds of agent programs/structures? Explain them briefly. Draw the schematic diagram of each. Show the working of A* algorithm on the given problem to find a path from A to D. Assume h(n)=1 for all nodes and h(n)=0 for D. 	CO2, CO3

Controller of Examinations