VIT UNIVERSITY
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Continuous Assessment Test-II – March 2022

Programme	:	B. Tech CSE with Specialisation in AIR	Semester	:	Winter 22
Course Title	:	Fundamentals of Artificial Intelligence	Code	:	CSE~~2012~~ 2039
			Class Nbr(s)	:	CH2021225000978
Faculty (s)	:	Dr Srinivasa Rao	Slot	:	F1
Time	:	**1½ Hours**	Max. Marks	:	**50**

Answer all the Questions

1. Given a two-player game tree as shown in Figure 1. The top node is a max node. The labels on the links are the moves. The numbers in the bottom layer are the values of the different outcomes of the game to the min player. **10**

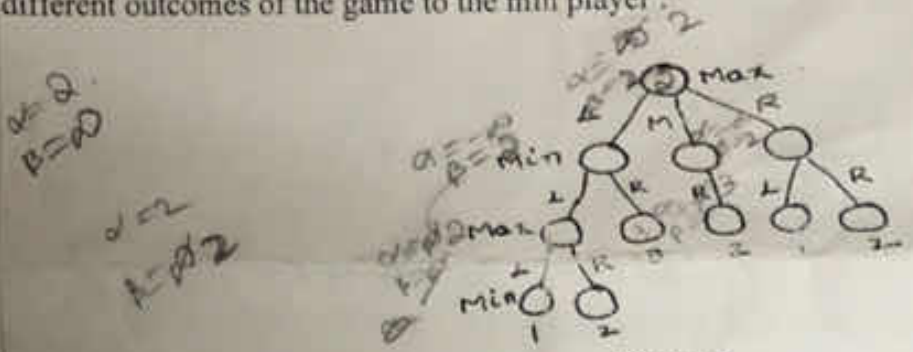

Figure-1

(a) What is the value of the game to the max player?Justify your answer [2m]
(b) What first move should the max player make? Justify your answer [2m]
(c) Assuming the max player makes that move, what is the best next move for the min player, assuming that this is the entire game tree? Justify your answer. [3m]
(d) Using alpha-beta pruning, consider the nodes from right to left, which nodes are cutoff? Justify your answer. [3m]

2. Krishna and Khan are good friends, one day both have played a two-person game P. Assume that the game tree 'T' of game P is a full binary tree. A full binary tree is a tree in which every node other than the leaf nodes has two child nodes. The game P is a zero-sum game, the total payoff is zero. That is, One wins(+1), the other loses(-1). The game P is also a complete information game, both the payers have access to all the information. That is, both can see the board and thus know the options the other player has. The game P is an alternative move game, the players take turns to make their moves. Assume Krishna has started the game and the height of the game tree 'T' is 'k'. **10**

Let ' d' be a given level of the tree 'T' and $d \leq k$. Design an algorithm to decide which player takes turns to make his movies at level 'd' and also print values of each state of 'T' at level 'd'. Compute the running time of your algorithm. Illustrate your algorithm for any sample input.

3.		Rama and Samuel are good friends, one day both have played a two-person game P. Assume that the game tree 'T' of game P is a full binary tree. A full binary tree is a tree in which every node other than the leaf nodes has two child nodes. The game P is a zero-sum game, the total payoff is zero. That is, One wins(+1), the other loses(-1). The game P is also a complete information game, both the payers have access to all the information. That is, both can see the board and thus know the options the other player has. The game P is an alternative move game, the players take turns to make their moves. Assume Samuel has started the game. Alpha-beta pruning is the strategy of eliminating the branches of 'T' that will not be contributing to the solution. Assume sub-tree 'T_1' of 'T' which is evaluated by the Alpha-beta pruning for the input 'T'. Design an algorithm to compute the total number of alpha cutoff and beta cutoff of T_1 Compute the running time of your algorithm. Illustrate your algorithm for any sample input.	10
4.		Use rules of inference to infer the conclusion from the following hypotheses: H1: If it does not rain or if it is not foggy, then the sailing race will be held and the lifesaving demonstration will go on. H2: If the sailing race is held, then the trophy will be awarded. H3: The trophy was not awarded . Conclusion: It rained.	10
5.		Given the premises: $(p \wedge t) \rightarrow (r \vee s)$, $q \rightarrow (u \wedge t)$, $u \rightarrow p$, $\neg s$, q. Show a valid argument for the conclusion r by using rules of inferences.	10