

Reg FA21-BCS-097
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Assignment A.I (Artificial Intelligence)
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Question No 1:->

Artificial Intelligence (AI):-

Its when a computer is programmed to do things that normally require human thinking like recognizing speech, understanding languages, or making decisions.

Weak AI:

This is when AI is designed to specific task, like playing chess or recognizing faces.

Its weak because it can do one thing well.

Strong AI:-

This is the idea of AI that's as smart as a human across the board.

It could learn, understand and solve problem like human. We are not there yet, but it's ultimate goal of AI research.

Question \rightarrow

~~Q.~~

Uniformed Search:

The type of search algorithm explores a problem space without any additional information other than its problem definition itself.

Its like navigating a maze without knowing anything about layout expect when you discover by moving through it.

Imagine Exploring a city without a map randomly trying different route and finally find destination.

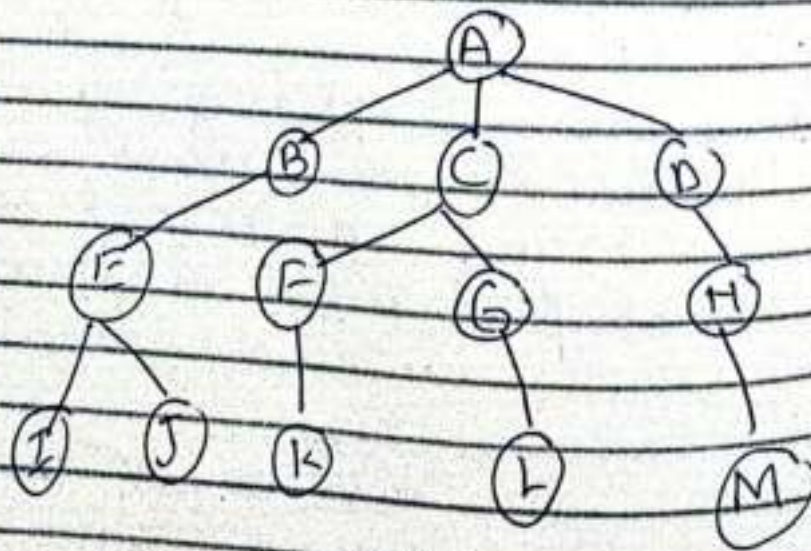
Informed Search

In contrast, informed search algorithms use problem-specific knowledge or heuristics to guide the search process more efficiently towards the goal state. ✓

Its like having a map or GPS guiding you through the maze, helping you choose the most promising paths based on prior knowledge.

Using GPS navigation to find the quickest route to a destination by considering traffic conditions and road distances.

Question No 3



$A \rightarrow B \rightarrow C \rightarrow D \rightarrow E \rightarrow F \rightarrow G \rightarrow H \rightarrow I \rightarrow J$

Since BFS traversal in if level order follow Queue (FIFO)

Answer No 4

∴ (B):

BFS Pseudocode

BFS (graph, start)

initiate an empty queue Q.
initiate an empty set visited
Make start node as
visited

Enqueue the start node
in Queue while Q is
not empty.

Dequeue a node in
form Q.
if it is target node
return "success".

For each neighbour visited

mark return "Failure".

Explanation:-

An empty queue is created to whole node of empty set visited to keep visited node created. Then from visited node it is added in to Queue. The loop continue until it is not empty. A node removed from front Queue. If reached value find return success not find it will given failure.

:- (C) :-

Application of BFS Algorithm:-

① Game AI:-

BFS aids in decision making process for game characters by exploring possible moves or strategies.

Maze Solving

BFS is employed to find the shortest path between two nodes in a graph.

Shortest Path Finder

BFS is used to find the shortest path between two nodes.

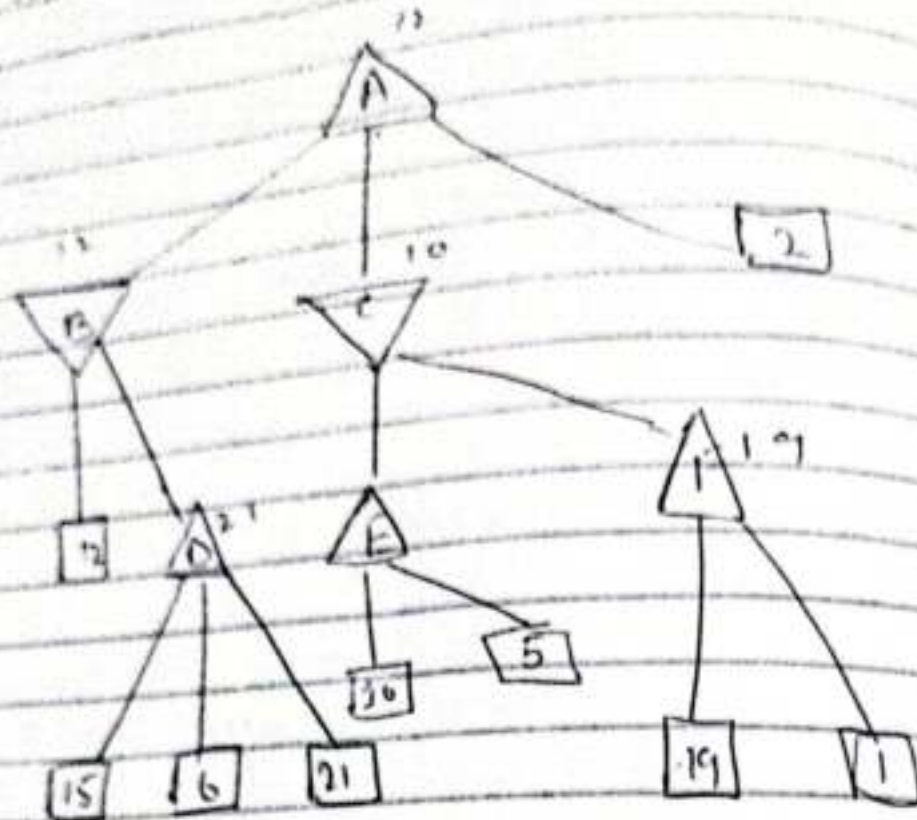
Robot Navigation

BFS guides robots to navigate through environment by exploring adjacent locations.

Tree Level Traversal:-

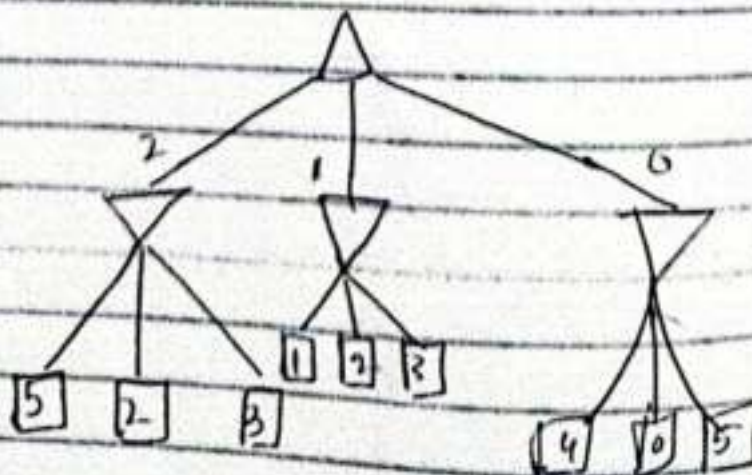
BFS explores a tree structured level, starting from root nodes.

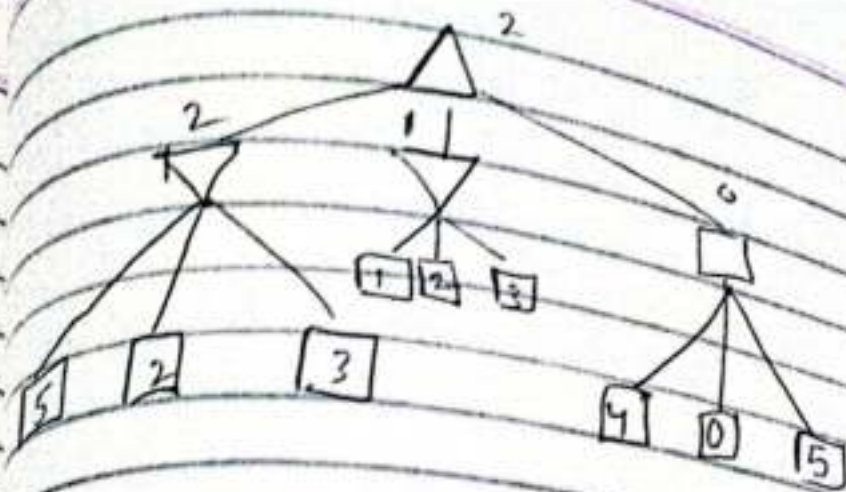
Question 4 -



Maximax Value of
Node A is 19

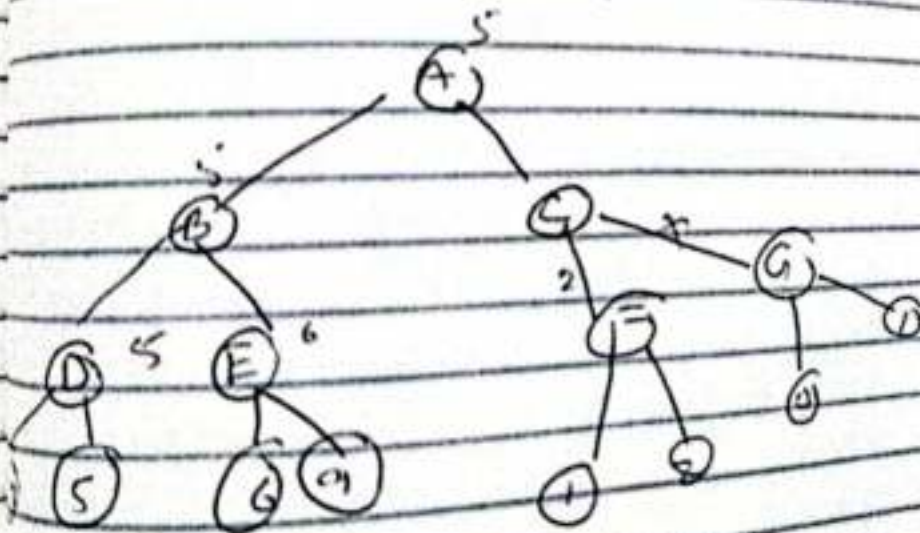
no. (B) 80-





Now Applying
Alpha-Beta pruning

$$\alpha = -\infty \quad \beta = \infty$$



Node A

$$\alpha = 5, \beta = \infty$$

Node B

$$\alpha = \infty, \beta = 5$$

Node C

$$\alpha = -\infty, \beta = 2$$

Node D

$$\alpha = 5, \quad \beta = \infty$$

Node E

$$\alpha = 6, \quad \beta = \infty$$

Node F

$$\alpha = 2, \quad \beta = \infty$$

Node G

Period

CLB-3(4)

Question #1:-

Definition:-

Constraint Satisfaction Problem (CSP) in artificial Intelligence refers to computational problem where the goal is to find a solution that satisfies a set of constraints. In a CSP, variables constraints specify allowable combination of set of variables.

Basic Components CSP:-

1) Variables: These are unknown or represent the need to be assigned values in order to find solution.

2) Domains: Each variable has a domain, which is the set of possible values it can take.

3) Constraints: These are restrictions or conditions that limit the possible combinations of values for sets of variables.