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NBA Accredited 3 Programs - (Computer Engineering, Electronics & Telecommunication Engineering & Electronics Engineering)
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Candidate Roll No. 16
(In figures)

Name: Adwait Pikalmunde

Date: 7/9/22

Examination: IA-2 Branch/Semester ETRX/VII

Subject: Artificial Intelligence

Supervisor Signature with Date: 7/9/22

Question No.	1 a	1 b	2 a	2 b	3 a	3 b		Total with Sign.
Maximum Marks	5	5	5		5		28/30	
Marks Obtained	03	05	–	10	10	–		

Q1] a] Turing test approach.

① Turing test approach is a kind of approach in which the computer is acquaintance with reading, compression, writing materials and languages.

② ~~When~~ The turing test approach is completely fed and accepted by computer when the invigelators are unable to grasp the content whether it is made by computer or a person.

③ Intelligence plays important role, whether computer can think in a way as the person approach considering the test.

④ There are things to consider for computer to proceed to turing test approach.

① NLP which is language processing plays important role.

② Taking ample amount of data through online source making this approach more feasible.

-03/

⑤ Turing test approach is a type of continuous feeding approach as data provided is not the only possible way to tackle the problem.

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Q1] b]

→

BFS	DFS
① BFS stands for Breadth First Search	① DFS stands for depth First search.
② Tranverse in form of tree level pattern	② Tranverse in form of tree depth pattern or sub-tree pattern
③ Breadth first search is in form of queue	③ Depth first search is in form of stack
④ Uses more memory as compared to DFS	④ Uses less memory
⑤ No Backtracking is required	⑤ Backtracking is done in DFS
⑥ Does not get stuck in infinite loop.	⑥ Gets stuck in infinite loop.
⑦ Optimal in finding shortest distance	⑦ Not optimal in finding shortest distance
⑧ If the distance between source and target is less, then BFS is preferrable	⑧ If the distance between source and target is large, then DFS is preferrable.

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Q2] b] PEAS descriptor for the following

→ ① satellite image analysis system

a] Performance measure :- For monitoring and capturing images of incident occurs in space and analysing it and rectify it

b] Environment :- Partially observable environment, Continuous environment, Unknown environment

c] ~~Actuators~~ Actuators :- Image capturing, Image recognition, Digital displaying

d] Sensors :- Cameras, thermosensors, processors, movement motors.

② Refinery controller

a] Performance measure :- Refining the product into good item while taking care of safety.

b] Environment :- Fully observable environment, refining, known environment.

c] Actuators :- Digital displays, robots arms, motors and ~~rooters~~ roters.

d] Sensors :- Refinners, PIR sensors, movement sensors,

③ E- commerce system.

a] Performance measure :- Title and Topic of the book, name of author, publishing year, publisher info, categories, model of book / edition.

b] Environment :- Fully observable environment, multi - agent environment.

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c] Actuators :- Digital displays, front end of websites, filling the content or data of agent

d] Sensors :- Access to internet network via http protocols.

4] Blood testing system

a] Performance :- Monitoring and collection of various blood samples as per considering the health of patients

b] Environment :- Unknown environment, partially favarable environment.

c] Actuators :- Displaying monitor, report displaying monitors and sensors.

d] Sensors :- Blood sample index, Hemoglobin index, managering sensors, temperature sensors.

5] Automated face recognizer

a] Performance :- Recognizing the face in the group used for security purposes

b] Environment :- Multi-agent environment, partially favorable, continuous environment.

c] Actuators :- Digital displays, Cameras, motors, image rectifier.

d] Sensors :- heat sensors, Cameras, monitoring system

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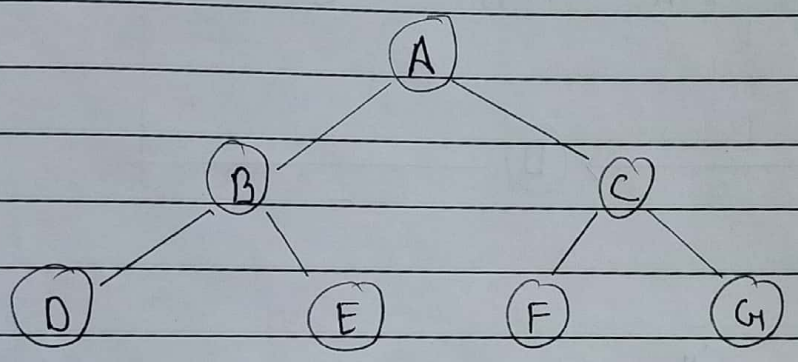
Q3]

a] Breadth First Search Algorithm

→ ① Breadth First Search Algorithm is a algorithm which follows tree level pattern i.e while communiting shortest distance or while formating, instead of moving downwards like DFS, it tackles the adjacent node.

② Breadth First search tranverse in form of queues, taking more ~~at~~ memory following first in first serve order.

3] For example :- consider the tree search.



→ Path followed in BFS will be ABCDEFG.

④ BFS is optimal in finding shortest distance. BFS is preferrable when the distance between target and source is less.

Steps in calculating distance of given nodes using BFS

→ ① Plot the given nodes as per the joints

② Name each node according to data available.

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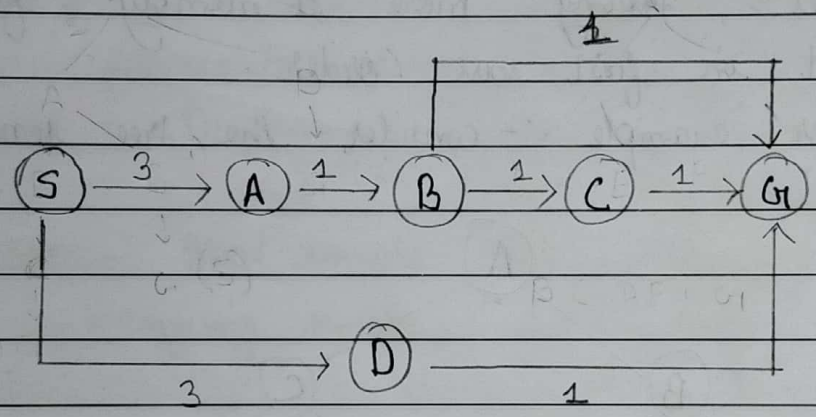
③ Consider the source node 0 intially making it easy to move further

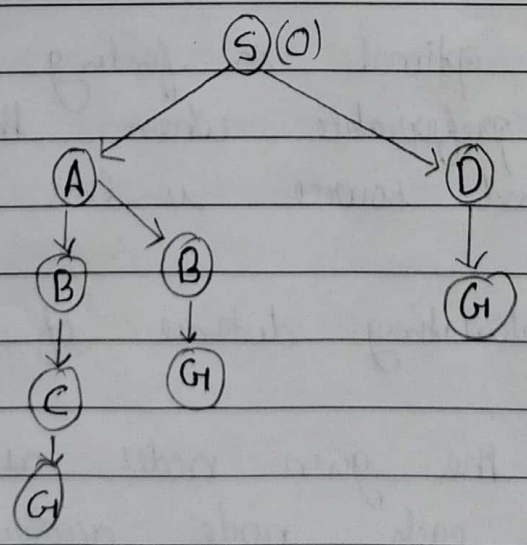
④ Accordingly moving towards each node add the distance

⑤ Lastly analysing and taking shortest distance into consideration

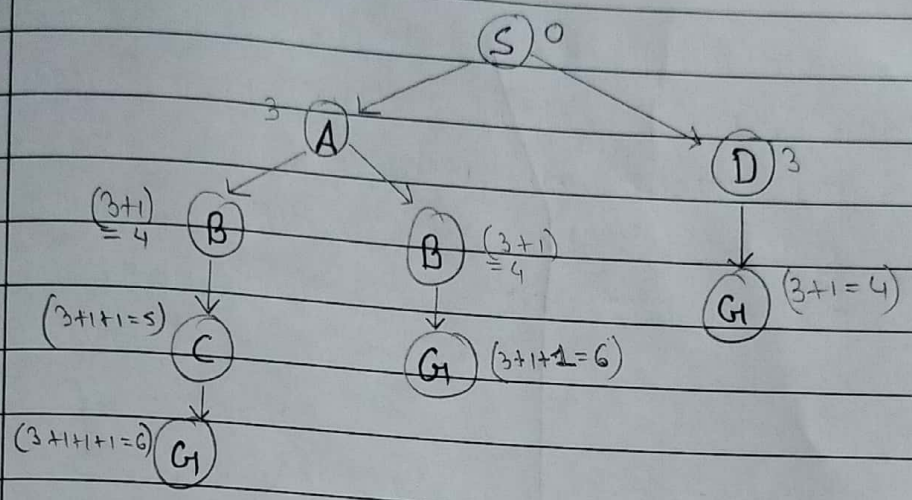
For example :- Consider



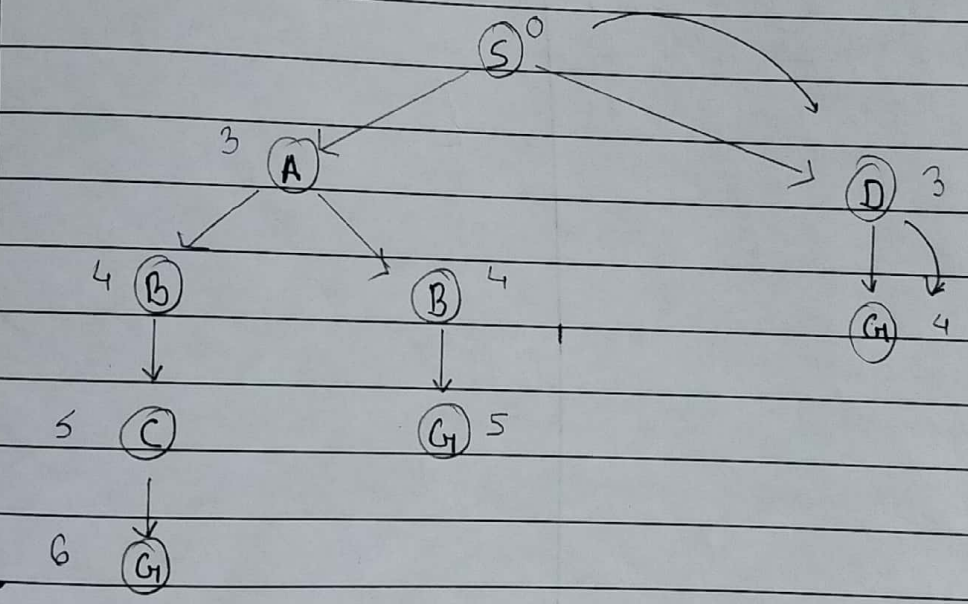
Here we will try to convert given nodes into tree layer format ~~i.e~~ and given S as (0) initially



Taking distance into consideration



Hence :-



Considering the path we can say S D G is the the shortest path to reach target G.

Main advantage of BFS algorithm is

1. No Backtracking is required
2. Cannot ~~sto~~ get stuck in infinite loop

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Candidate Roll No. 09 (In figures)

Name: Abhishek. Narendra. Mishra

Date: 07/09/22

Examination: I unit Test Branch/Semester ETRX/VII

Subject: Artifical Intelligence

Supervisor Signature with Date: 7/9/22

Question No.	1 a	1 b	2 a	2 b	3 a	3 b		Total with Sign.
Maximum Marks	5	5	5		5			
Marks Obtained	03	05	08	07	07		25/30	

Q.1] a] Turing Test Model is developed By Alan Turing in 1950s.
- It is a Test Where Interogator frames Some Questions and Checks Wheather the Answer given By Computer is matched With Answer given By Humans.
- The Interogator doesn't Knows Which answer is given By Human and Which is given By Humans.
- The Computer Passes the test If the answers found to be Correct/matches With Humans answers.
- The Computer Uses NLP (Natural Language Processing) to Correctly frame the Behavioural patterns in the Question and answer ~~to~~ Accordingly. (Intelligence)
- The Computer's ability of thinking like Humans is checked Using this Test Approach.
- This is one of the Early Approach in the field Artifical Intelligence.
- The Effectiveness of these has lead to development of Artifical Intelligence in Today's World.

-03-

Q.1] b] Differentiate BFS and DFS.

BFS	DFS
a] BFS is Breadth First ~~Seach~~ Search.	a] DFS is Depth First Search
b] BFS uses Queue Approach	b] DFS uses Stack Approach
c] BFS does not Support Backtracking	c] DFS is recursive hence, it Supports Backtracking
d] BFS is good for Shorter Goal	d] DFS is good for far distance goals
e] BFS requires less Memory	e] DFS requires More Memory
f] BFS ~~is~~ Works on FIFO "First In First Out".	f] DFS Works on LIFO "LAST In First Out"

~~g] BFS is Cheap Com~~

-05-

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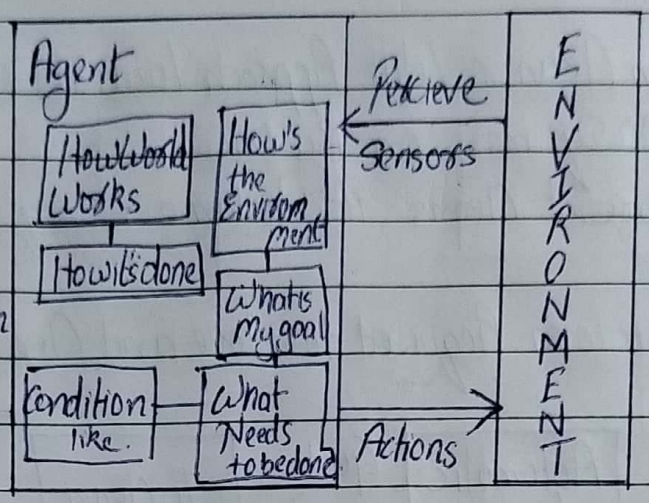
8.2] a]

Agent:- The Agent in AI works as decision Maker after sensing the Environment Using Sensors.



– goal Based Agent Diagram –

- Goal Based Agent Has a Internal Approach towards its Goal. i.e Goal is already Saved in the Agent.
- Hence, the Agent Knows What to achieve as a Goal
- Goal Based Agent Senses the Environment and takes action With respects to its Goal i.e Action are taken in Order to reduce the distance from its Goal.
- It has the Knowledge of Environment in its Internal Knowledge.
- Also, it perceives What is happening in the Environment.
- The Goal Based Approach is Used By Various Applications.
- The Automatic Vaccum Cleaner is the Best Example for Goal Based Agent
- The Automatic Vaccum Cleaner has the goal of Not having a Single dust Particle in the Mapped Room.
- The Automatic Vacuum Cleaner divides the Room into 100 Squares Now, its goal is to Keep Each Square Box Clean.
- Hence, the Automatic Vaccum Cleaner Will Approach it By Cleaning the Squares Below it.
- This Approach Will Reduce Each Square it travels from the Mapped 100 Squares.

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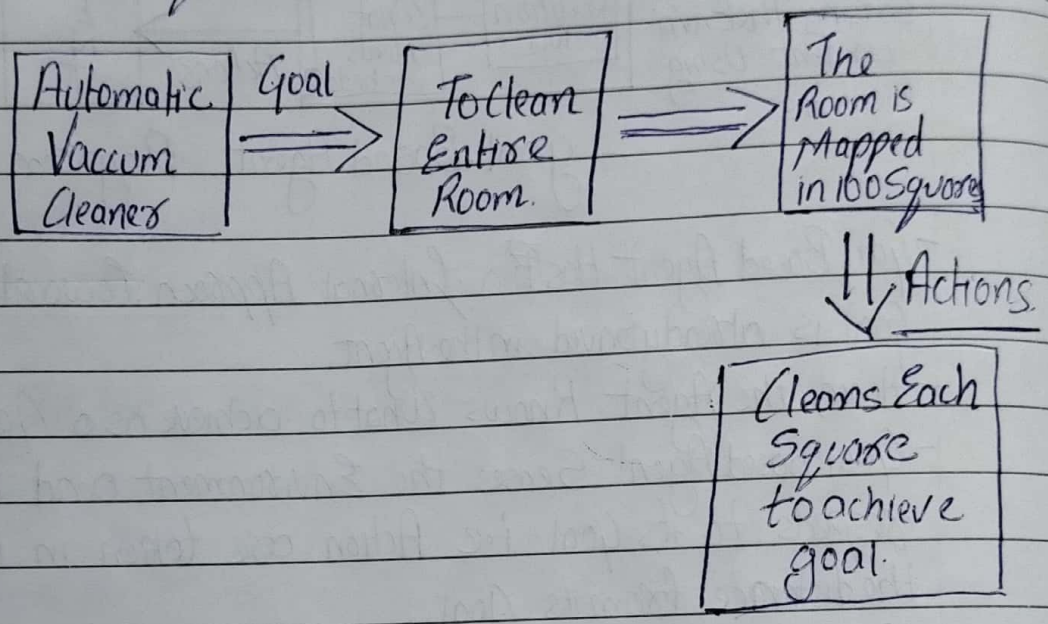
- The Automatic Vaccum Cleaner Will Approch towards its goal of Cleaning Entire 100 Squares One By One.
- Each Square it Cleans its distance is ~~seq~~ reduced By One towards its goal.
- This Will in turn Required to Move and Clean Each Square one by One.



08

Q.3 [b] Depth First Search Algorithm is Used Where Some Extensive Computation is Required.

- DFS Uses Very High Memory allocation.
- Also, it Requires to Approach on Stack Memory / Data Structure
- The Data is Stored and Fetch Using Stack approach.
- Stack Approach refers to LIFO "Last In First Out".
- The DFS is good for Applications Where the Goal is For Reached.

Eg:- Facial Recognition System.

- It uses DFS Approach ~~as~~ where the data is Stored in the form of Stack.
- The data of All the faces in Cummalative ~~##~~ Will be Stored in Stacks.
- Each time the Person Comes for Facial Recognition the Algorithm Starts Searching~~#~~ the Datasets looking for the Similar faces.
- The Searching / Sorting Takes Place inside a Stack of datasets acquired
- The Goal of the Facial Recognition System is to Match the Orignally Captured datasets to the Real time Face displayed With 100% Accuracy.
- But it Cannot achieve ~~#~~ 100% accuracy So, Can it achieve 80-90% at max.
- But the Algorithm tries to Maximize its accuracy. Each time it Recognizes the face.
- The DFS Plays an important Role ~~toe~~ in order to try and achieve its goal.

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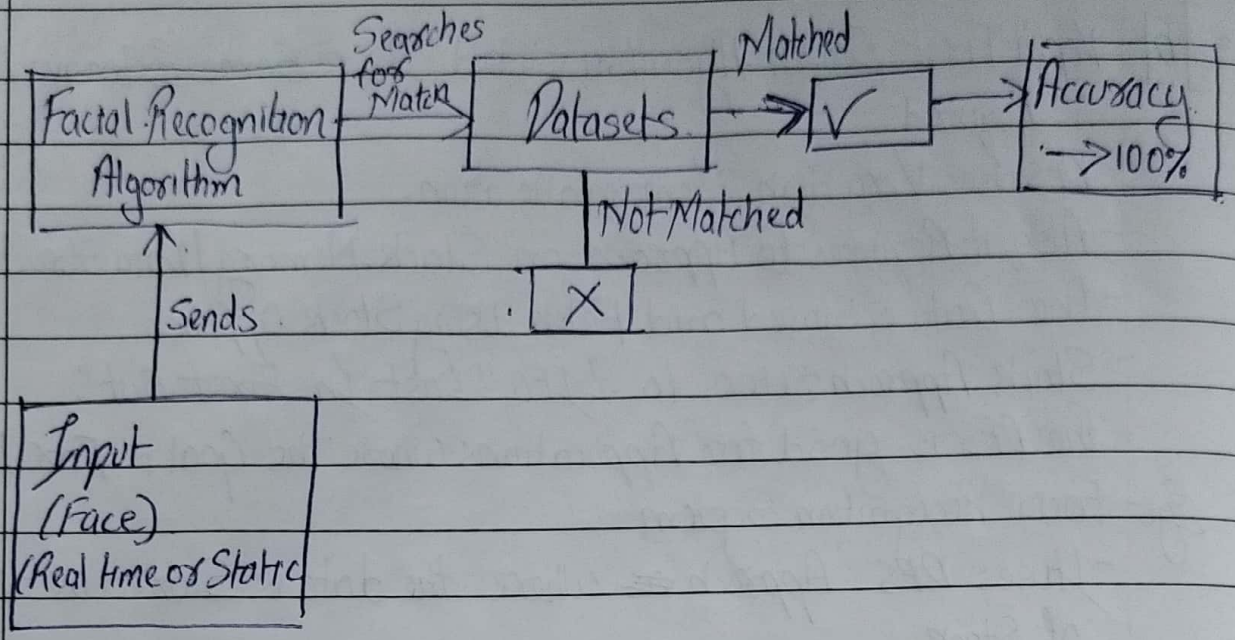
Facial Recognition Algorithm
Searches for Match
Datasets
Matched
✓
Accuracy
→100%
Not Matched
X
Sends
Input
(Face)
(Real time or Static

-0 ✗-

Q.2] b] ~~Fer~~

	Performance	Environment	Action	Sensors
Satellite Image Analysis System	- quality of Image. - Capture time - Zoom	Space No Gravity	To Click Images	Camera Solar Panel For Power.
Refinery Controller.	- Regulate of Input and Output pressure. - Check leaks - Effectiveness in Managing tank filling	Factory Environment With Pipes and tanks	- To regulate Pressure value - level tanks Evenly - Check for Impurities	- pressure - level - Viscosity. - leak.
E-Commerce System.	- To manage Orders Effectively - Traffic Mangement - dispatch System	- Data Centers - Delivery hubs - Seller shops, etc.	- To Bypass Excess Orders to Sellers - To alert Sellers as well as Customers about ~~Order~~ Status.	- Barcode Scanner - Product capture (Camera)
Blood testing System	- Accuracy of test Results - Time to perform Each test	- Hospitals, Clinics, etc	- To Perform ~~actu~~ acute analysis of Blood	- Microscope - Camera - Zoom Camera
Automatic Face Recognizer	- To Perform at high accuracy in face Matching	- Schools, colleges Offices, etc	- To Match realtime face to the Datasets	- Camera

-10-

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Candidate Roll No. 08
(In figures)

Name: Bhavesh Mhatre.

Date: 7/9/22

Examination: Test1 Branch/Semester ETRX / VII.

Subject: Artificial Intelligence.

Supervisor Signature with Date

Question No.	1 a	1 b	2 a	2 b	3 a	3 b		Total with Sign.
Maximum Marks	5	5	5		5		13/30	
Marks Obtained	—	05	—	-	08			

Q1)

(b)

	BFS	DFS
Abbrivation	BFS stands for breadth first search	DFS stands for depth first search
Definition	BFSs approach is to start search from root node and then ~~search~~ go on searching one depth at a time.	DFSs approach is to start search from root and ~~se~~ then search by branching ~~differe~~ from different nodes until reaching the node with no further connection
Data type	BFS ~~uses~~ has queue structure	DFS has stack structure.

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Suitable application	This approach is suitable for the applications where the ~~one~~ one decisions does not affect later.	This approach is suitable where ~~decisi~~ consicutive decisi ons matter ~~ie~~ eg. In game AI like Chess etc
Speed	BFS is ~~slow~~ compa-ritively slower than DFS.	DFS is faster than BFS.
Suitable Situations.	BFS is ~~so~~ good when decision node is close to the root node.	DFS is good when tree has many branches and decision node is far from root node.

-05

Q3)

(a) (i) BFS algorithm which stands for Breadth first Search algorithm is the algorithm used for decision making and is applied on binary trees.

(ii) Breadth first search ~~ist~~ algorithm initiates on root node, and searches one depth at a time,

(iii) Starting from the root node, it will search all nodes connected to the root node.

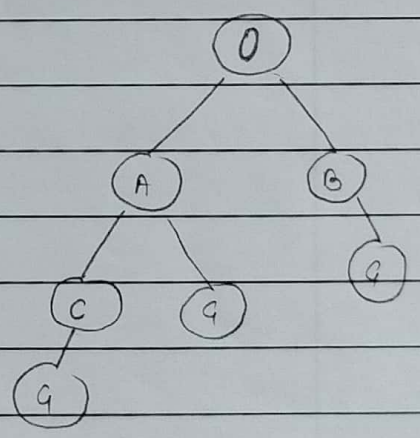
(iv) ~~Algo~~ In this order algorithm will search ~~depth~~ one depth level at a time, till it gets to the last node.

(v) This algorithm is relatively slower as it searches ~~depth too~~ with depth.

(vi) This approach is suitable for applications ~~with~~ ~~to~~ having decision trees with low depth.

-08

(vii) Lets consider decision tree as given above.



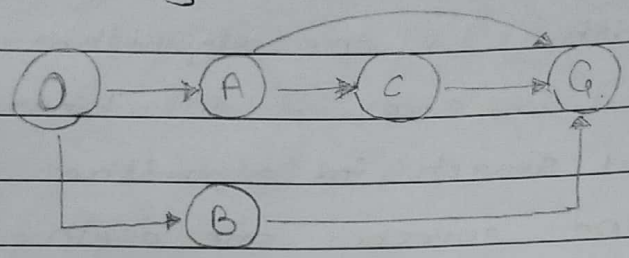
Decision Tree

(viii) BFS algorithm will start from root node which is topmost node O.

~~vii~~ (ix) then it will search node A and B, when done it will search the lower depth level, which have C, G and G. when done it will reach onto last G, and will terminate.

~~(x) BFS algorithm will sea~~

(x) BFS algorithm search,



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Candidate Roll No. 20 (In figures)

Name: VIRAL SHETH

Date: 07/09/2022

Examination: Term Test-1 Branch/Semester Electronics

Subject: Artificial Intelligence

Supervisor Signature with Date

Question No.	1 a	1 b	2 a	2 b	3 a	3 b		Total with Sign.
Maximum Marks	5	5	5		5			
Marks Obtained	05	05	08	–	07	–	25/30 + 01 = 26/30	

Q1] a) Turing Test approach.

⇒ • Alan Turing (1950) found Turing Test.

- It is a kind of experiment which indicates the quality of Artificial Intelligence.
- In this test there ~~are~~ is an interrogator, a person and a computer.
- First let us see a diagram:

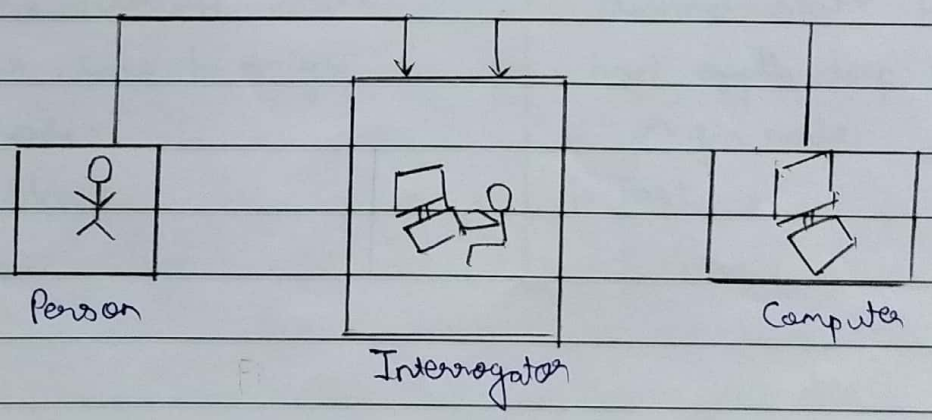

Fig. Turing Test ~~approch~~ approach.

- Interrogator is placed different room / setup so he/she cannot physically view either person

or computer.

- Then a quiz is send to both intelligent computer and person.
- Quiz contains question like 'are you a computer'?
- Computer can intentionally send wrong answers to interrogator to prove that it is a human.
- After the quiz if interrogator can tell that who is computer and who is person by reviewing responses, computer fails the test
- But if interrogator cannot detect which one is human based on responses, computer passes the test and can be proved that it has Human Intelligence.

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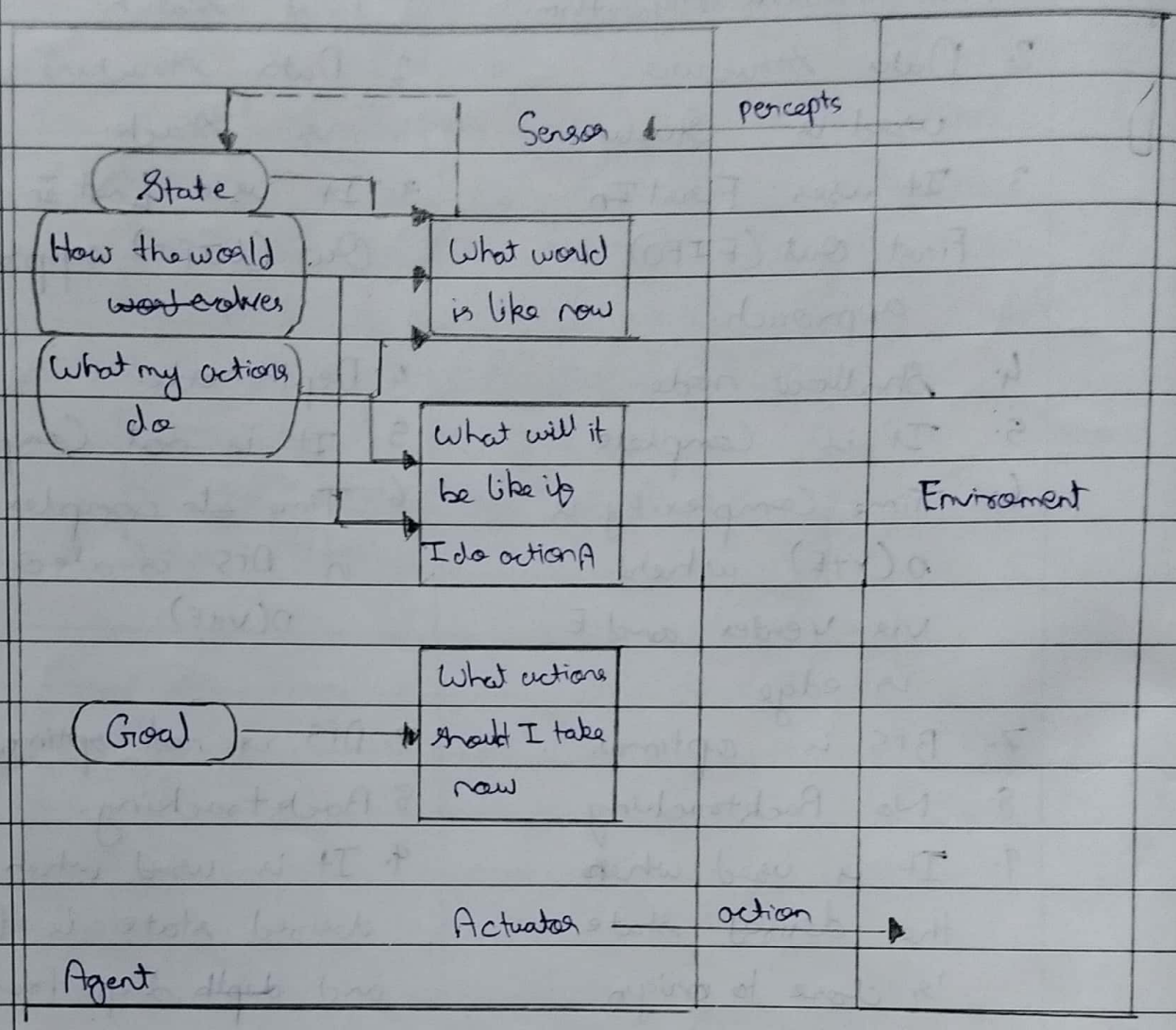
(b)

BFS	DFS
1. It stands for Breadth First Search Algorithm.	1. It stands for Depth First Search.
2. Data Structure used is Queue.	2. Data Structure used is Stack.
3. It uses First In First Out (FIFO) approach.	3. It uses Last In First Out (LIFO) approach.
4. Shallow node	4. Depth node.
5. It is Complete	5. It is not Complete.
6. Time Complexity is O(V+E) where V is Vertex and E is edge.	6. Time ~~cla~~ complexity in DFS is also O(V+E).
7. BFS is optimal	7. DFS is not optimal
8. No Backtracking	8. Backtracking.
9. It is used when the desired state is close to origin node.	9. It is used when desired state is far and ~~depth~~ deep from origin node.
10. Slow	10. Fast

-05

Q2] a) Describe Goal-based agent with example.

⇒ Goal-based agent:



- A Goal based agent is a type of agent.
- It is better than simple-reflex and Model-reflex agent.
- Goal is very important aspect in life.
- If a person has goal in life, than it can help him/her in decision making at a specific

moment of time.

- With the help of Goal, there is saving of time on outliers.

Now, in AI,

- The agent percepts the environments and it also has past perception saved in memory.
- The above point is Model - reflex agent, now add a goal for the agent.
- With the help of ~~p~~ experiance of past perception and adding Goal clears the path ahead, the agent gets a definite path to the goal.

Let us see an example,

- A Mars lander wants to up the hill.
  - So Unlike, Model based reflex agent, now the agent will set a goal to up the hill. so it will set power consumed, fuel usage and the path. So the agent is learning and ~~rece~~ receiving ~~knowed~~ knowledge at every point of time.
- Benifit:
  - An agent can learn in the path.
  - It is easy to configure ~~any~~ or update any setting as it already has past perception.
- Issue:
  - Goal is not solution to everything, Goal can be achieved by relying on ~~a~~ a easy, reliable path.

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- There can be multiple paths to goal, so Goal based agent cannot choose the correct one, here is where Utility agents comes in use.

08

Q3.]

a) Breadth First Search Algorithm:

- Breadth First Search Algorithm is a ~~the~~ Un-informed search technique in Artificial Intelligence. It is also called as Blind technique. Reason is that a user can explore data upto next state but after which the path is not determined.

- The Data structure used in Queue.

- It uses First in First out (FIFO) approach. which means ~~to~~ if a state enters the queue first, than it'll be the first one to get out of queue.

- Shallow Node:
  BFM completes the exploring whole node and the moves to the next node so it appears in the horizontal way of exploring.

- BFM is optimal in nature as the user is guaranteed that his state/node will be explored. That's why BFM is complete. No data is left unexplored.

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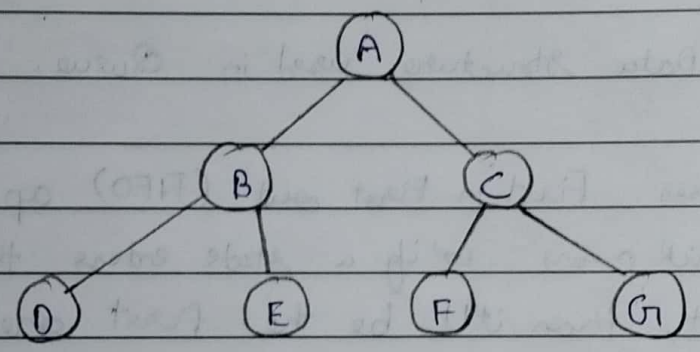
- Time Complexity of BFM is $O(V+E)$
  Here, ~~O is~~
  V is Vertex.
  E is Edge.

- There is no backtracking in this algorithm because Once the node is covered it doesn't enter the queue again.

Let us see an example:



Visited :
Queue :

Now, Let us start with A, so it can be moved to either B or C, Let's continue with C, so now in queue it is A C B, if we remove A from queue then we explore node C. A C B F G. Similarly after removing C from queue, we proceed with node B which consists D and E, so-

A C B F G D E

After B, we move to F, but F is not further divided into any nodes.

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Candidate Roll No. 20 (In figures)

Name: VIRAL SHETH

Date: 07/09/2022

Examination: Term Test-1 Branch /Semester Electronics

Subject: Artificial Intelligence

Supervisor Signature with Date

So the queue looks like:

Out ← | ~~A~~ | ~~C~~ | ~~B~~ | ~~F~~ | ~~G~~ | ~~D~~ | E | ← In

The above figure shows that all the states are explored with the help of Breadth First Search algorithm.

-07-
+01
08.

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Candidate Roll No. 02.
(In figures)

Name: Diksha Dopliade

Date: 07/09/2022

Examination: Test-1 Branch/Semester L.Y. ETRX.

Subject: Artificial Intelligence

Supervisor Signature with Date: 7/9/22

Question No.	1 a	1 b	2 a	2 b	3 a	3 b		Total with Sign.
Maximum Marks	5	5	5		5		20/30	
Marks Obtained	02	05	07		06			

AI

Q.1]

a Ans Turing Test approach, was an approach made by a renowned scientist Adof Turing.
In this approach, the point of this approach was to show that the robot and human interrogation ~~unit~~ until, the robot comes to know that he is ~~at~~ interrogating with another robot.
During this approach there was an interrogation between a robot and a human through computer.
Live human at the place was not necessary because vibration for the robot in front was not required.
This approach gave AI a new research to look after.

-02

b) ans

	Key word	BFS	DFS
i)	Abbreviation	Breadth first Search	Depth first search
ii)	Definition	BFS is a traverse in which the ~~node~~ data goes through each node at a lower level, and then go to the higher level. It finds the shortest path for algo.	DFS is also a traverse, but its journey starts from root and it goes on increasing in branches and sub-branches.
iii)	Branch used	BFS used a whole tree for its process	DFS uses branches which are further distributed in sub-trees.
iv)	Memory	Memory used is more	Memory is less
v)	Back tracking	Back tracking is not required	Back tracking is required for recursive condition.
vi)	Speed	Speed is low	Speed is High
vii)	Visiting children / sibling ?	In BFS siblings visit before children	In DFS children visit before siblings.

05

Q.2]

a) Ans Goal-Based Agents, are those agents which have a goal set in their system. They have in their mind that they have to complete this goal.
Along with completing the goal they make sure that it gets completed in a Right manner.

Goal-Based Agents will look after the environment make a process how to carry forward in given work. And they make their decisions in such a way that it covers the goal in short time.

To complete the goal, they try to eliminate the distance and work forward for the goal.
These agents are very time precised and ~~&~~ get the work done accordingly.
Also, utility based agent are also similar to the goal based agents. The only difference is that it adds up the utility measurements to complete the goal.
Goal-Based Agents ~~are~~ come under fully observable environment. They also have percept history of the Environment they are working on, so that it helps them to eliminate the distance and ~~work~~ complete their goal on given time.

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An Example for the goal-based agent would be cleaner.
A cleaner has its goal set in it, whenever they see dirt on the floor, they would move left or Right and suck the dirt off the floor.
The sucking of the dirt is the goal set for the machine.
So, this is how a goal-based agent works and ~~does~~ complete its goal.

-07-

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Q.3]

a) Ans i) BFS known as Breadth First Search Algorithm, is an algorithm which is a tree like structure, in this algorithm, ~~the~~ tries to find the shortest path for the ~~algorithm~~ tree.

ii) BFS is a traverse algorithm in which it goes through each node of the tree first at the lower level and then after finishing up every node on the tree it goes to higher level.

iii) In higher level too, it works through the same way, it moves through each node before going to the next level.

iv) In BFS, the algorithm uses the whole tree, Unlike DFS, it uses sub-trees and starts from the root.

-06-

v) The speed of initiating this algorithm is low, but the memory used up is more.

vi) In BFS, the tree nodes, these node have sibling and children nodes, so here sibling nodes visit BFS before children node.

vii) Backtracking in BFS is not required.

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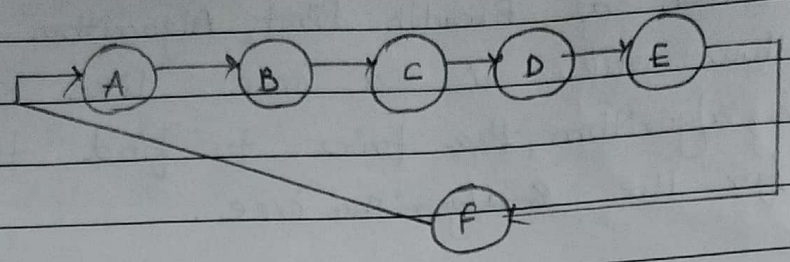

For this example we have to find out the shortest path through which we can reach from point A to point F.

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Candidate Roll No. 22
(In figures)

Name: Jeet P. Sikligar

Date: 7/9/22

Examination: Unit Test-1 Branch/Semester Sem-7

Subject:

Supervisor Signature with Date

Question No.	1 a	1 b	2 a	2 b	3 a	3 b		Total with Sign.
Maximum Marks	5	5	5		5		05/30	
Marks Obtained	—	04	00	00	01	—		

Q1b.

BFS	DFS
• Its full form is Breadth first search.	Its full form is Depth first search.
• It uses the concept of FIFO (First in First out).	It uses the concept of ~~last in~~ LIFO (Last in First out).
• It is slower compared to DFS.	It is faster compared to BFS.
• It is used when vertices are closer to the goal	It used when the ~~vt~~ vertices are far from goal.
• It requires less memory.	It requires more memory.
• ~~Used when we need to find the shortest path.~~	~~Used when we~~

-04-

22 a. Example

5	7	2
3	1	6
4	□	8

initial state

3	5	2
7	□	6
4	1	8

goal state

$f(n) = g(n) + h(n)$

where $g(n)$ is no. of iterations of the blocks

$h(n)$ no. of digits not in their goal state

$f(n) = 0 + 4$

5	7	2
3	1	6
4	□	8

up

$f(n) = 1 + 3$

5	7	2
3	□	6
4	1	8

up

$f(n) = 2 + 3$

5	□	2
3	7	6
4	1	8

left

$f(n) = 3 + 2$

□	5	2
3	7	6
4	1	8

down

$f(n) = 4 + 1$

3	5	2
□	7	6
4	1	8

right →

$f(n) = 5 + 0$

3	5	2
7	□	6
4	1	8

goal state achieved

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Q2b.

	Application	Performance
1.	Satellite image analysis system	Quality of the

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Q3a. Breadth first search algorithm is an efficient shortest path finding algorithm.

- It is used in ~~situ~~ situation where there are multiple ways to reach a solution or state but a ~~tat~~ least time or cost consuming route is required.
- In this ~~algor~~ algorithm the transfering is done ~~statistically~~ statistically from root or source node

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Candidate Roll No. 25 (In figures)

Name: Sushil Vishwakarma

Date: 07/09/2022

Examination: IA1 Branch/Semester ETRX/Sem7

Subject: Artificial Intelligence (AI)

Supervisor Signature with Date

Question No.	1 a	1 b	2 a	2 b	3 a	3 b		Total with Sign.
Maximum Marks	5	5	5		5			
Marks Obtained	03	05	03		07		18/30	

Q.1 b] Soln b] →

	BFS	DFS
Stands for	1] Stands for Breadth first search	1] Stands for Depth first search.
Approach	2] In BFS, a vertex is visited and their adjacent vertices are traversed, ~~before moving onto the next vertex~~	2) In DFS, when a vertex is visited, their adjacent vertices may have their adjacent vertices. and those are to be first traversed before coming back to unvisited vertex.
Backtracking	3] There is no backtracking	3] It has principles of recursion and hence supports backtracking.
Data Structure	4] Works on queue algorithm	4] works on stack algorithm.
when to use.	5] should be used when the target is near from the starting point.	5) Should be used when target is far from the starting point.

05

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Soln a] → Turing test approach

i] Turing Test is a test for an artificial intelligence system/software in which the answers from an AI system/software and a human are indistinguishable.

ii] It was designed by Alan Turing.

iii] In this test, an observer is presented with answer to a question from both, an AI and a human.

iv] ~~These~~ The question asked can be mathematical, cognitive, etc. This is done so as to check the efficiency of an AI ~~from a~~ thru of how close it is to a human intelligence.

v] Observer doesn't know which answer is provided by whom. If both the answer/solutions are indistinguishable, then the AI passes the turing test.

vi] This means the AI has the same efficiency as that of a human and can perform cognitive tasks just like a human.

03

Q.3

Soln a] → **Breadth First Search (BFS) Algorithm**

i] BFS is an algorithm that find shortest path to the target if the target is near.

ii] In this Algorithm, a vertex is visited and then its adjacent vertices are visited.

iii] This is done until all the vertices are visited.

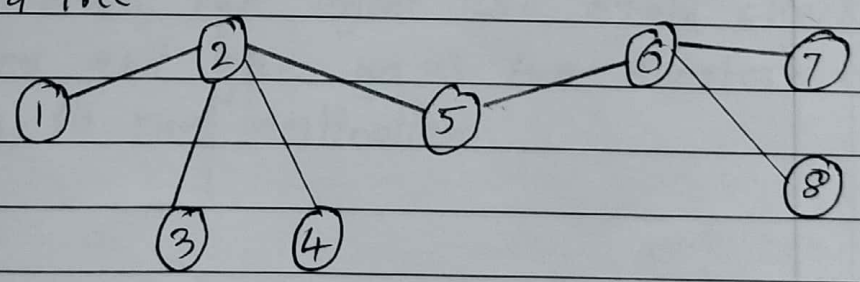
iv] This algorithm is used for graph and since binary tree is also a graph, it can be used to for its operations.

v] BFS is therefore doesn't have backtracking and requires more memory.

vi] When a vertex is visted, it removed from the queue and its adjacent vertices are added to the queue.

vii] An example using BFS on a tree shown as:

Consider a tree



We use a queue and add adjacent vertices and remove visited vertices. We can start from any vertex.

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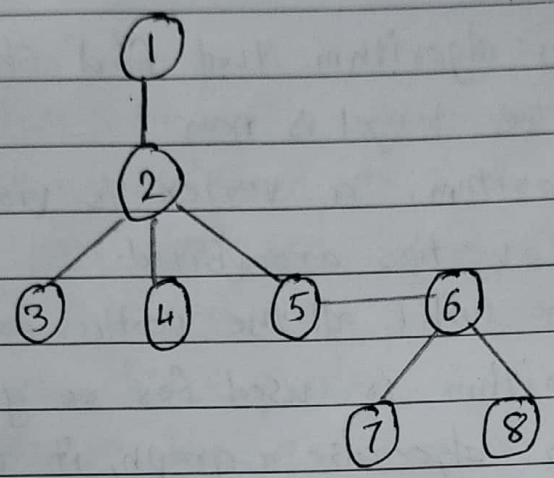
we start from vertex 1, then;

θ = | ~~1~~ | ~~2~~ | 3 | 4 | 5 | 6 | 7 | 8 |

1, 2, 3, 4, 5, 6, 7, 8



Now, the Tree is leveled.

Hence, it is now much easier to read the graph/ tree and perform applications or operation when required.

-07-

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Q.2

Soln a] → Goal - based agent.

i] Goal based agent is mainly focused on the end goal.

ii] This means ~~[illegible]~~ shortest of the path is take and the goal is achieved.

iii] The agent monitors the environment and gives the system a feedback to which path is to be taken.

iv] The agent can work dynamically as it may comprise of sensors, actuators etc.

v] This makes in suitable for many real world applications which are dynamic.

Example:

Suppose in car we want to reach a destination. This destination is the goal. Now, the agent will recommend a path to be taken. After you take a turn, the agent will again check for variables and give ~~yo~~ us the shortest recommended path to the destination.

-03-

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SIGN MUMBAI-22

Candidate Roll No. 05
(In figures)

Name: Vishal Jawade.

Date: 7/9/22

Examination: Test - I Branch/Semester LY/ETRX.

Subject: Artificial intelligence.

Supervisor Signature with Date

Question No.	1 a	1 b	2 a	2 b	3 a	3 b		Total with Sign.
Maximum Marks	5	5	5		5		08/30	
Marks Obtained	0	05	02		01			

Q1] b]

		BFS	DFS.
i)	stands for	BFS stands for Breadth first search	DFS stands for depth first search.
ii)	speed	slower than DFS	faster than BFS.
iii)	used in conditions	it uses fifo. first come, first serve	it uses Lifo. Last come first serve.
iv)	suitable for	it is suitable for short operation	it is suitable for big operations.
v)	working	it Jumps on every node that is close to produce the outcome	it Jumps as long as node possible to get the outcome
vi)	memory	it deletes the node after Jumping on another.	it stacks the all node then after the outcome it deletes it.

-03

		Bfs	Dfs.
vii)	cost	it is cheap than Dfs.	it is costlier than Bfs.
viii]	time	it takes more time to produce the outcome	it takes less time to produce the outcome.

02

Q3] a]

→ agent is ~~the~~ someone who takes the ~~out~~ input ~~the~~ from the enviroment through the sensor and delivers it back to the enviroment by the actuators. agent is the one who does the perceving, thinking and acting..

goal-based agent:- this agent takes the input from ~~the~~ its surrounding enviroment. and it's work is to fullfill the goal as the outcome. when the goal is achived it's working is done for the instance.

Ex. motion sensing lights it has the motion sensor and it's goal is when the motion is detected the lights will get turned ON.

02

[redacted]

~~Q.3] a]~~

~~-7 Breadth first search algorithm :-~~

~~b] Depth first search algorithm :-~~

Q.3]

a] Breadth first search algorithm :-

it is a algorithm that ~~ser~~ serves first come first ~~seve~~ serve service. it gets jumped on all the linear nodes in the data. and produce the outcome.

Ex. suppose we have to make a list of the students marks in the yearly exam so the algorithm will get the data as the input. and check the mark of every students and will make the list as the output.

-01

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Candidate Roll No. 03
(In figures)

Name: Jammesh Gupta

Date: 7/9/22

Examination: Term test -1 Branch/Semester ETRX / 7

Subject: Artificial intelligence

Supervisor Signature with Date: 7/9/22

Question No.	1 a	1 b	2 a	2 b	3 a	3 b		Total with Sign.
Maximum Marks	5	5	5		5			
Marks Obtained	03	05	08	10	08		26/30	

a]

b]

i) Satellite image analysis system

Performance Measure	Enviorment	Actuator	Sensors.
Analyse the image and the stuff in it	Orbital satellite datalink	Display on the ground control	~~Camera Programs~~ ~~set~~ camera & ~~model~~.

ii) Refinery Controller

Performance Measure	Enviorment	Actuator	Sensors.
Purity, efficiency ~~safety~~ accuracy. alarms.	Refinery Oil drils	Motors and rotors ~~rotator~~, display to display it monitoring values.	temprature sensor, fire sensor.

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3] E-commerce System

Performance Measure	Enviorment	Actuators	Sensors.
Author, books, genre customer ratings. reviews.	Websites, Applications	Monitoring System, ware-house	Database, HTML

4] Blood Testing System

Performance Measure	Enviorment	Actuators	Sensors
Type, accuracy, RH level, ~~Medical history of individual~~	Hospitals, testing zones.	Centrifuge Testing device	Molecules analyzer. compound analyzer.

5] An automated face Recognize.

Performance Measure	Enviorment	Actuator	Sensors.
correct recognition accuracy speed.	wherever the device is used office, school etc	camera focus to get clear images	camera.

a] 10

b)

BFS	DFS
1] It is known as Breadth First Search	It is known as Depth First Seach.
2] BFS builds the tree level by level	DFS builds the tree subtree by subtree.
3] It works on the concept of FIFO (First in First out)	It works on the concept of LIFO Last In First out.

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4]	It requires more memory	It requires less memory.
5]	Optimal for finding the shortest path	Not optimal for finding the shortest path.
6]	Slow as compared to DFS	Fast as compared to BFS.
7]	It uses queus to work	It uses stacks to work.

-05

Q1]

a] The model for turing test was ~~made~~ made by Allen Turing in 1956. It was one of the first definition and ~~ei~~ introduction/criteria for ~~a~~ Artificial Intelligence

~~In turing~~ For an AI to pass the turing test there is a human who ~~passes~~ some written questions to the AI and ~~if the~~ then the AI answer those questions in ~~key~~ written format or an display. If the human operator concludes ~~from~~ that the answers written by the AI are ones from a human then the AI has passed the turing test.

There is no touch or observation between the operator and the AI ~~bea~~ because the Turing test test's ~~the~~ ~~intellegine~~ ~~wethere~~ the intelligence of the AI is like a human or not.

But they are ~~alos~~ alowed to pass videos and objects throughthe hatch to test its perception skills.

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For an AI to pass the turing test it needs
1] NLP for the AI to understand English.
2] A ML model to adapt to new situation and come to a rational conclusion
3] A knowledge database to refer to its learned experience and store new one's there.
4] logical and reasoning capabilities.

~~For~~ An AI to pass the test needs the following things :-
1] A camera to observe it's surroundings and to have perception
2] Motors, rotator actuator to handle objects pass through the hatch.

03

Q3
a] Breadth First Search Algorithm.

(i) Breadth First Search (BFS) is a tree based search algorithm in Artificial intelligence.

(ii) BFS is a traversal approach in which we first walkthrough all the nodes at the same level before moving onto the next level.

(iii) BFS uses a queue to store its memory.

(iv) It works on the concept of FIFO (First in First Out).

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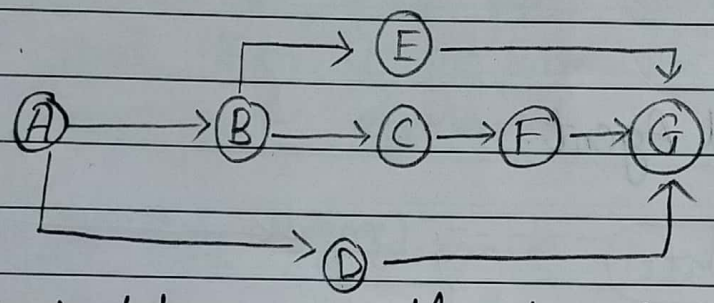
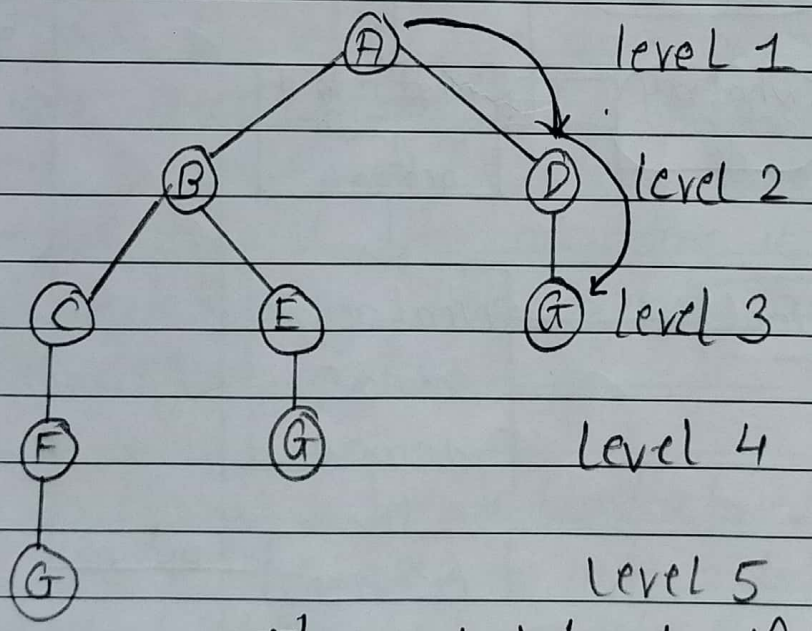
v) BFS builds the tree level by level.
vi) It requires more memory. It consumes a lot of memory.
(vii) It is optimal to find the shortest path in a tree.
(viii) When the ~~tra~~ target is close to the node i.e the goal node is close to the root node the BFS algorithm performs better.

Eg
Lets take the below example and find the path that will be taken by BFS to reach from node A to node G.



-08

First lets convert the above format to tree format.



The route taken by the BFS to reach from A to G is A – D – G.

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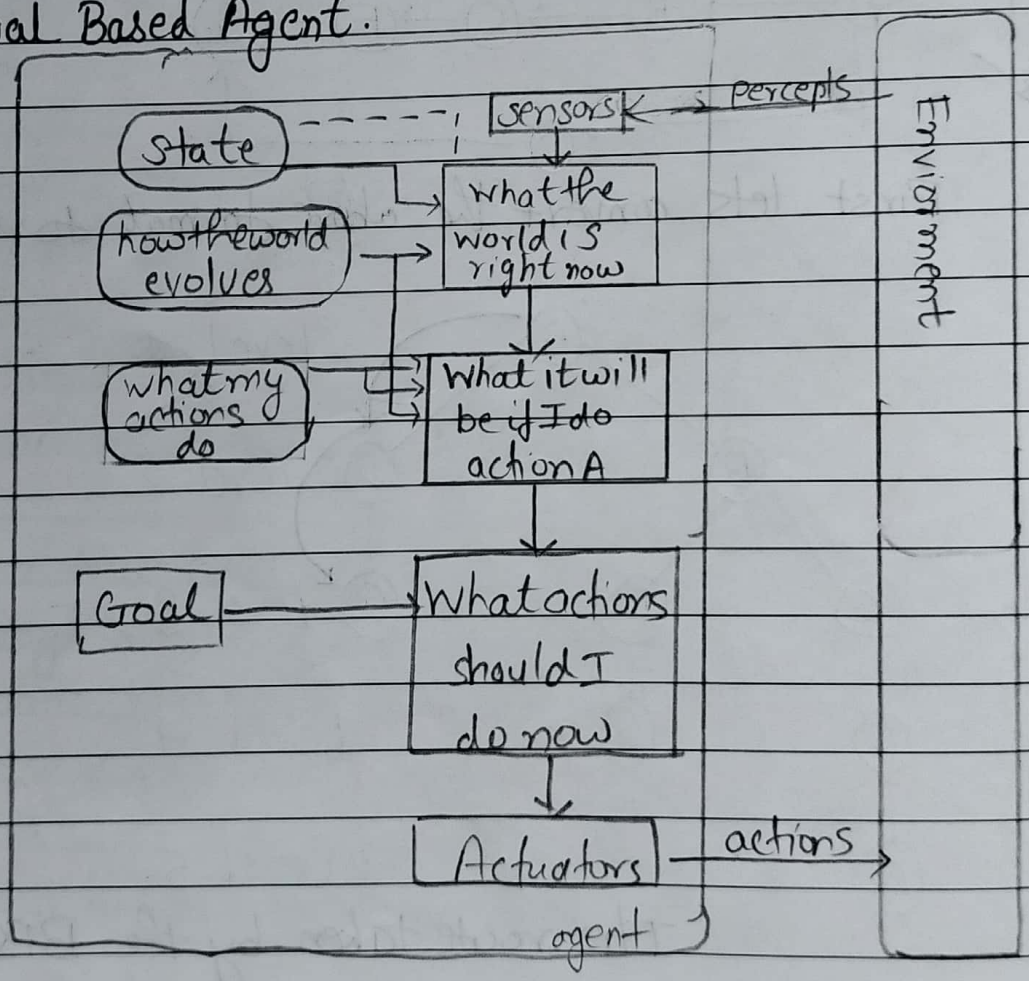
Lets analyse the above question first. We know that BFS model first walks through all the nodes at the same level then moves on to the next one.
The same thing happens here, from A it first goes to B & D at level 2 after finding that G is not there it moves to C, E & G at level 3. Since now it know where G is and it reaches G first in level 3 it chooses the route A – D – G.

Q2

a) Goal Based Agent.



(i) In goal based agent the model has goals and it uses these goal to decide what action should it do.

(ii) It expands the model based agents by having the goal information in it.

(iii) They choose an action in order that will achieve the goal first.

(iv) It uses percept history and internal state to make descision about the model and the world around it.

(v) It checks how its world evolves and what it actions will do, if it brings it closer to the goal then it performs them (actions). with the use of actuators in the enviorment.

Eg:- Let take an example of mars rover in this example there is a rover on mars and it faces a problem where it has to go uphill. In this condition to achieve its goal to go uphill it decides what amount of force it will be need to apply on its wheel to reach there or complete its goal after calculating it executes them. and start moving. This is how a goal based agent works.

If this was a model based reflex agent we would have need to code a lot of if else conditional statements to complete the same task.

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Goal based agent are also flexible and you can easily code the way it decides its goals. In this agent you don't need to change the code everytime the enviorment changes.

08

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Candidate Roll No. 01
(In figures)

Name: OMKAR. S. CHAVAN

Date: 07/09/22

Examination: Test - I Branch/Semester ETRX - VII

Subject: Artifical Intelligence.

Supervisor Signature with Date

Question No.	1 a	1 b	2 a	2 b	3 a	3 b		Total with Sign.
Maximum Marks	5	5	5		5		13/30	
Marks Obtained	03	01	07	05	02			

Q.1 a) Explain in detail Turing test ~~approach.~~ approach.

Ans: In Turing Test ~~the~~ a ~~Rob~~ Robot is Put to the test in front of the introgator who has no idea that he is introgating a Robot.

- Robot is build to answer question and Perform task humanly.
- So the Machine ~~is~~ has be applied to NPL (Natural Language Processing). To speak naturally like human
- ~~It~~ The machine understands the enviornment and Percepts using sensors and perform task or answer questions using actuators.
- Sensors are observing the enviornment and ~~unde~~ understands the question by visualizing the ~~int~~ interogator physical moments and tone of voice. and gives the answer humanly.
- In this test introgator has no idea that he is introgating a machine.
- In this case as long as introgator does not Recognize that it is not human then ~~the~~ the turing test has been successfull.

-03

~~PEN~~

Q.2)

a) Describe ~~goal~~ goal-based agent

Ans: goal-based agent: Goal based agent ~~uses~~ understands the enviorment ~~and~~ analysis it and ~~t~~ gives the result ~~accordi~~ accordingly. When ~~the~~ the machine is set to ~~do~~ do the perticular Job in perticular amount of time It will do the Job until it Reaches its ~~g~~ ~~setl~~ ~~Setd~~ set goal no matter What.

- It does not has to be Knowledgeable about history or ~~For example~~: Past experiences.
- It has to be Problem solving in Real time issues which come accross their goal.

The ~~Pas~~ Past experience can be used to ~~avid~~ avoid ~~Same~~ Past mistakes and to improve with ~~higher a~~ higher accuracy to Reach the goal.

~~For exa~~

For example: • If the ~~s~~ Machine is setting its a course of ~~to~~ Mumbai to Pune.

- It will show you the Route to Pune from ~~mumbain~~ ~~t~~ mumbai and give you the fastest Route on the map.
- At the same time it will ~~t~~ give you feedback on the traffic Routes which you should avoid so ~~this~~ goal based agent is also Problem solving to ~~Reach~~ Reach its goal.
- The Past experiences could be use full to avoid bad Roads which could damage the accuracy to Reach faster

-07

Performance Enviroment ~~Agen~~ Actuators Sensors.

Q. 1)
b)

BFS	DFS
Breadth First Search	Depth First Search.
BFS algorithm has tree like structure where it has single nodes	DFS algorithm has tree like structure where it has sub nodes
BFS algorithm is transverse	DFS alogrithm is ~~also~~ also transverse.

01

Q.2)
b)

	Performance	Enviornment	Actuator	Sensor
satellite image analysis system	It is Perform to capature images to understand weather	space, ~~over the glob~~	gas pumps, hydrallics	Camera, temperature sensor, Proximity sensor.
Refinery controller				
Automate face Recognizer	To capture face Picture,	offices, schools, colleges, ~~seq secur~~ security	Motors,	Camera.
Blood testing system	To test blood of an ~~individual~~ Person	Hospitals, clinic.	Pumps,	

-05-

glob
glob

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weather

Q. 3)
a)

Ans. • Bredth first search [redacted] algorithm is known as
• BFS it has a tree like structure algorithm to Percept the ~~to~~ Prediction going through different ~~Possibilities~~. Probablities.

• BFS is the transverse algorithm which goes through each node of the tree at the ~~least~~ lower level

• The computation speed of the algorithm gets better every time it Passes the node.

• In BFS the algorithm uses the valued node to identify the Prediction ~~accurately~~ accurately

• In BFS the Probability measures are not stacked upon each other they are Placed ~~beside~~ beside each other to be able to Percept each value nodes to Predict the accurate one.

• The tree like structre has node ending there are no sub nodes to this tree structure.

-02

• It is first come first unlike DFS Last come Last

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