Name of the Subject: KNOWLEDGE SYSTEMS Subject Code: IT-714

Seat No: IT076 Student ID: 18ITUBN116 Branch/Sem: IT-VII

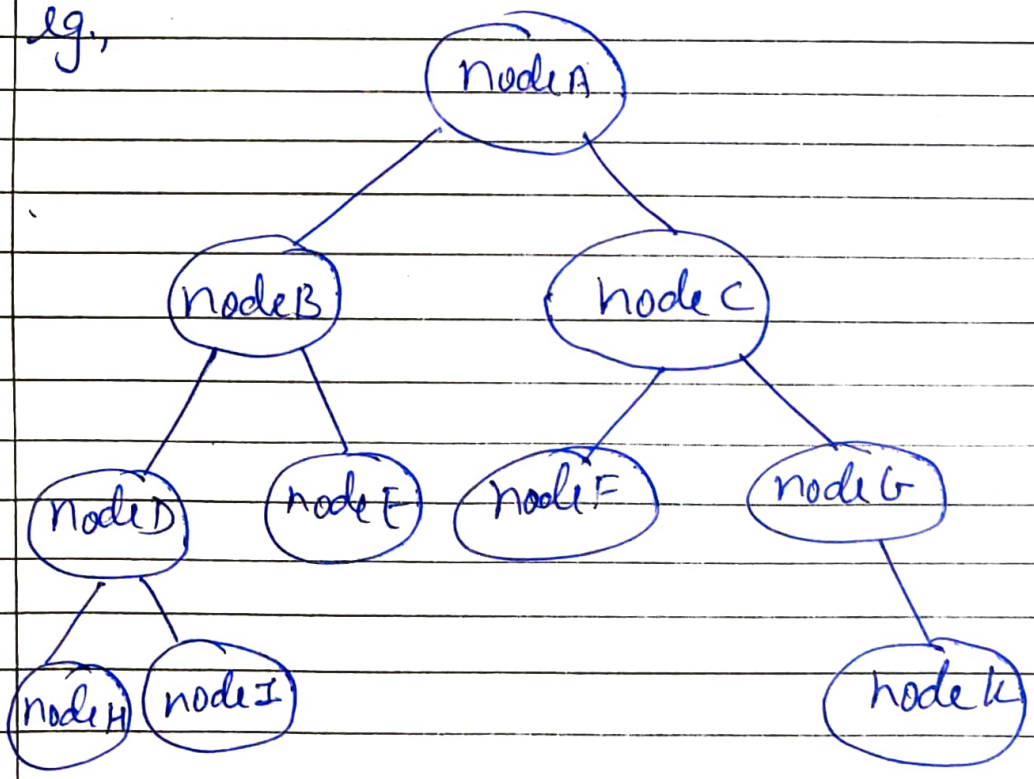
Q2 Attempt Any Two

[a]

Iterative Deepening DFS

- It combines the benefits of DFS & BFS search algorithm.
- It also provide memory efficiency & fast search.
- IDDFS also have some drawbacks, it repeats all the work of previous page.

eg.,



- ~~Node~~ Step 1 - Node A
- Step 2 - Node B, Node C, Node A
- Step 3 - ~~xxxxxxxx~~

Node A, Node B, Node D, Node E, Node C, F, G.

→ Step 4.

Node A, Node B, Node D, Node H, Node I, Node E, Node C, Node F, Node G, Node K.

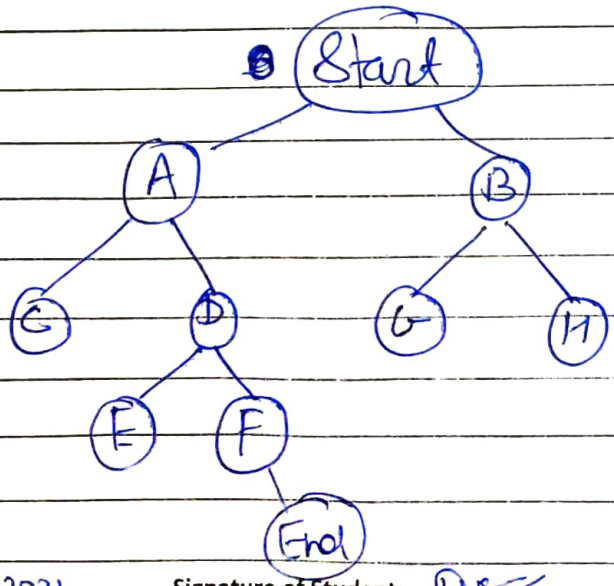
⇒ Time Complexity is $O(b^d)$: b = breadth, d = depth.

→ Space Complexity $O(bd)$

⇒ Breadth First Search

- It will search the solution level by level.
- BFS will provide solution if it is exists.
- If there is more than 1 solution then we can find optimal solution.
- It needs lots of time if solution is far away from the Root Node.

→ eg.,



So, Path is.

Start – A – B – C – D – G – H – E – F – End.

— Space Complexity = $O(b^d)$; b = breadth ; d = depth.

Time Complexity = $O(b^d)$

Q2 [c]

(1) Best First Search.

Step	Node expand	Child.	Openlist	Close.
1	S	A(10), B(13), C(4)	A, B, C	C(4).
2	C	D(2)	A(10), B(13), D(2)	D(2).
3.	D	[redacted], F(1)	A(10), B(13), F(1)	F(1)
4.	F	G(0)	A(10), B(13), G(0)	Search Stop goal reached.

Path → S – C – D – F – G

(17) (4) (2) (1) (0).

Name of the Subject: KS Subject Code: IT-714

Seat No: IT076 Student ID: 18ITUBN116 Branch/Sem: IT-VII

(2) A*

→ Start with S

So, For Node A - g(n)

$F(n) = g(n) + h(n)$.

S - A = 6 + 10 = 16

Node B

S - B = S + 13 = 18

Node C

S - C = 10 + 4 = 14.

⇒ Now, Min. is S - C

So, Selecting Node C.

Node D

S - C - D = 10 + 6 + 2 = 18

⇒ As, The total Min we get is S - A = 16 less than S-C-D

So, Selecting S-A.

Node E

S - A - E = 6 + 6 + 4 = 16

~~So, going further & selecting node F.~~

$\therefore$ S-A-E-F = 6 + 6 + 4 + 1
= 17

$\therefore$ ~~So, S-A-E-F-G = 6+6~~

As we are going further the f(n) value is increas

So, we can't find the path for A*.

Name of the Subject: KS Subject Code: IT-714.

Seat No: IT076 Student ID: 18ITUBN116 Branch/Sem: IT-VII

Q3 a

MOTHER
+ FATHER
PARENT

⇒ Supposing R = 3

∴ 2R = T [R+R = T].

T = 6

∴ 2(3) = T

∴ T > 6

Carry.

So, 2T = R. or 2T = R + 10 C_1

So, R > 3.