Assignment - 02

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Section - A

Course Code: CSE 403
Course Title: Artificial Intelligence and Expert Systems

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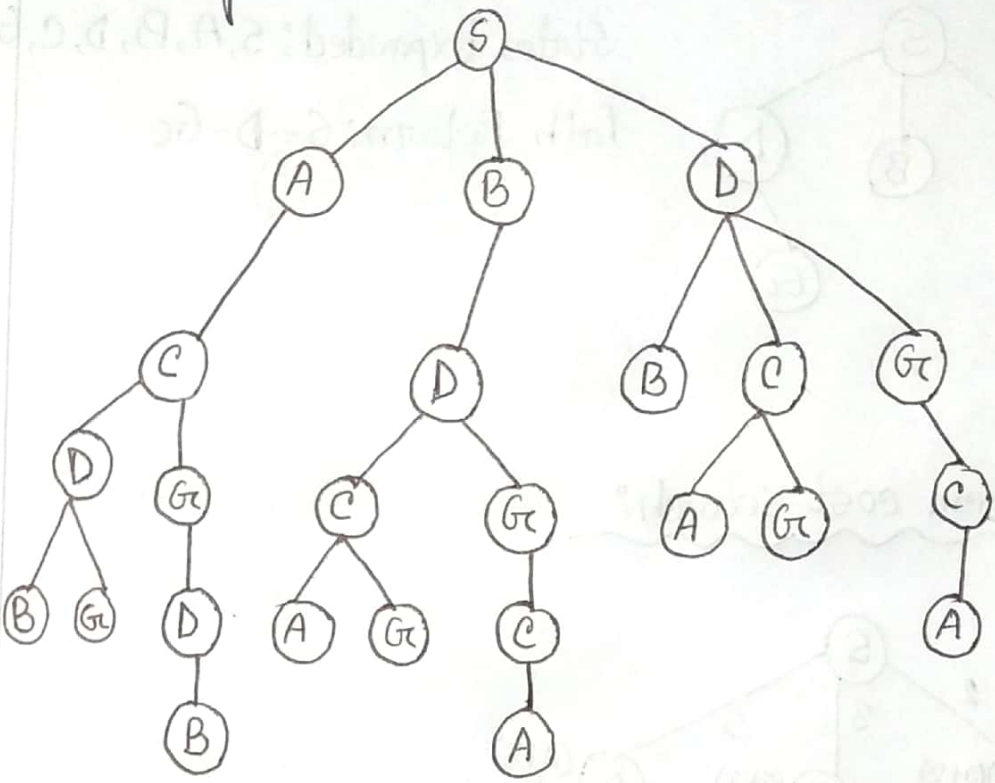
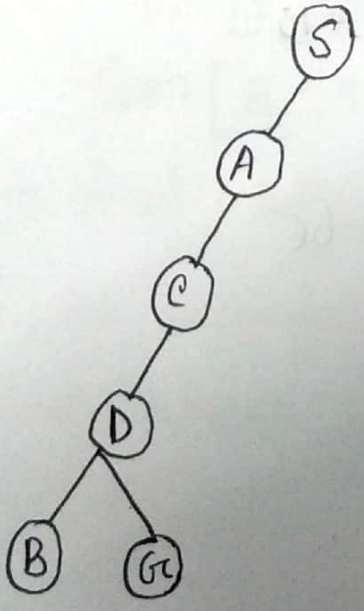
Problem-1

Considering Start node as (S) and Goal node as (Gt),



This is the search tree of the given problem.

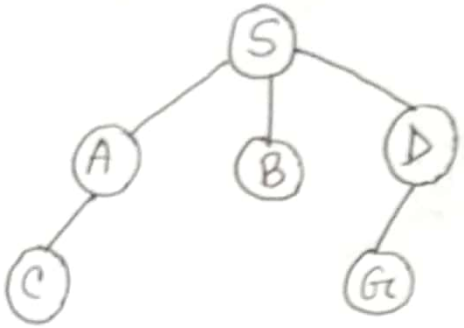
(a) Depth-first search:



States Expanded: S, A, C, D, B, Gt

Path Return: S-A-C-D-Gt

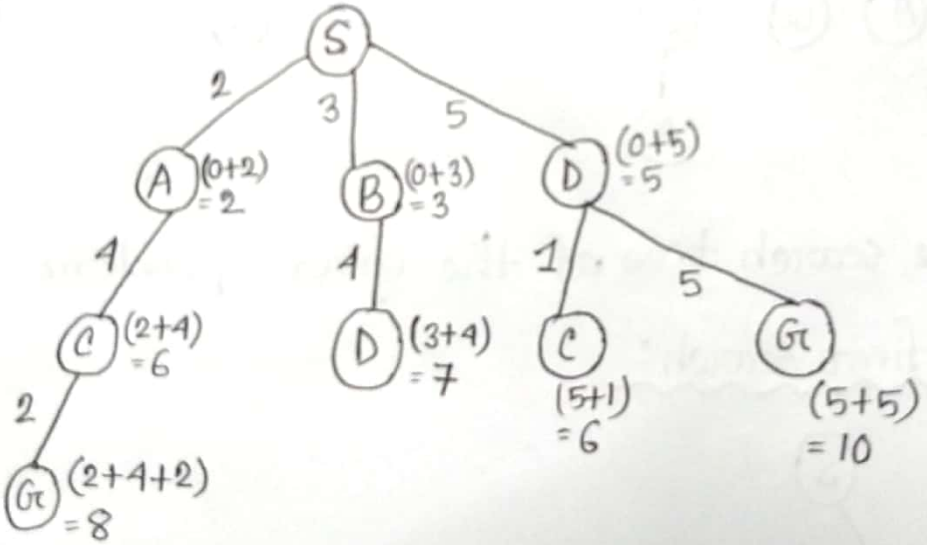
(b) Breadth-first search:



States Expanded: S, A, B, D, C, Gr

Path Return: S-D-Gr

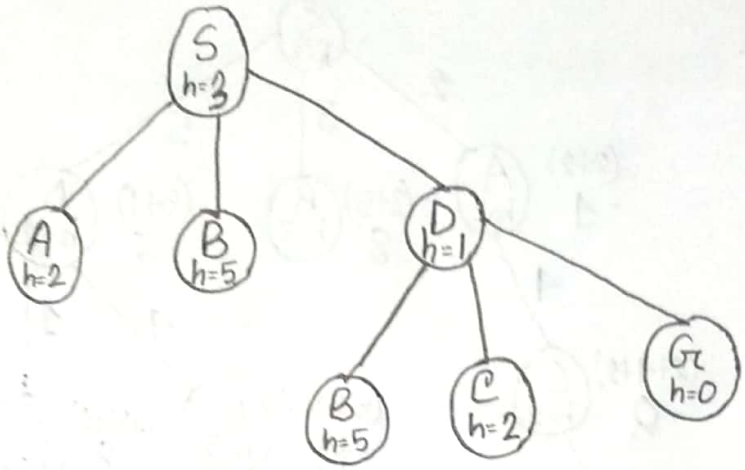
(c) Uniform cost search:



States Expanded: S-A-B-D-C-Gr

Path return: S-A-C-Gr

(d) Greedy search with the heuristic h shown on the graph.



node	h(n)
S	3
A	2
B	5
C	2
D	1
Gr	0

Expanded states are put into the closed list.

Initialization:

Open [A, B, D], Closed [S]

Iteration 1:

Open [A, B], Closed [S, D]

Iteration 2:

Open [B, C, Gr, A], Closed [S, D]

Open [B, C, A], Closed [S, D, Gr]

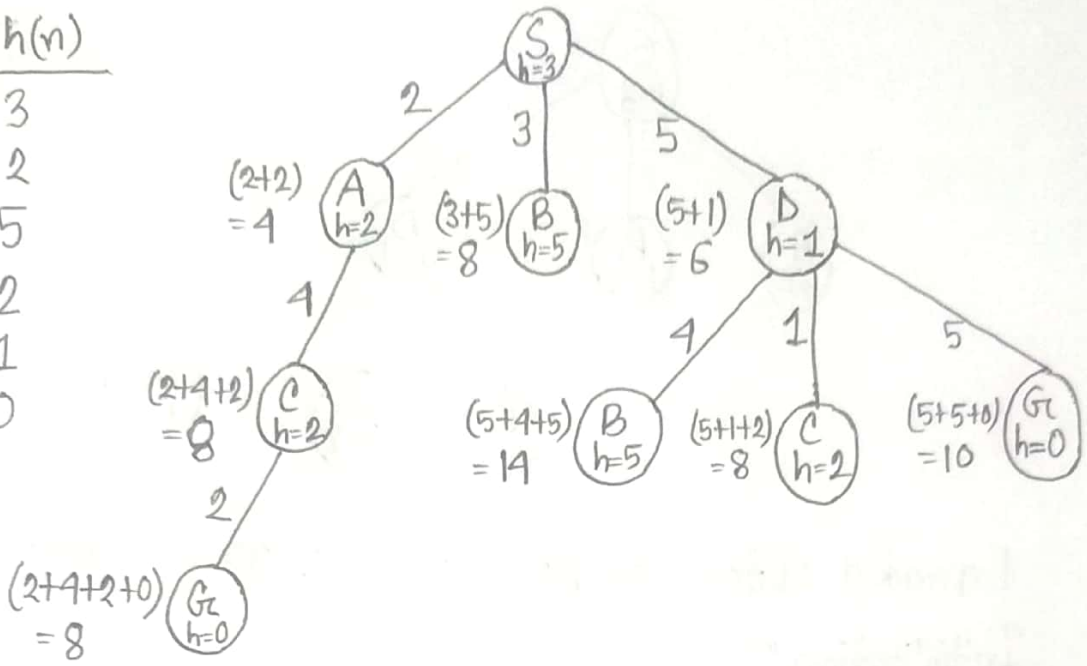
The final solution path will be: S → D → Gr.

States Expanded: S, D, Gr

Path return: S-D-Gr

(e) A* search

node	h(n)
S	3
A	2
B	5
C	2
D	1
Gr	0



Initialization: {(S,3)}

Iteration 1: {(S→A,4), (S→B,8), (S→D,6)}

Iteration 2: {(S→A→C,8), (S→B,8), (S→D,6)}

Iteration 3: {(S→A→C,8), (S→B,8), (S→D→B,14), (S→D→C,8), (S→D→Gr,10)}

Iteration 4: {(S→A→C→Gr,8), (S→B,8), (S→D→B,14), (S→D→C,8), (S→D→Gr,10)}

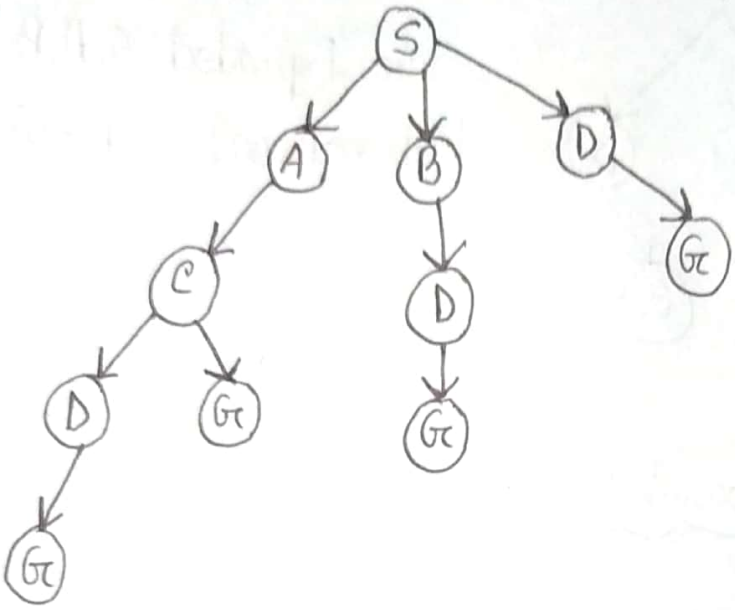
Final result will be: S→A→C→Gr, optimal cost 8.

States expanded: S, A, D, C, Gr

Path return: S→A→C→Gr

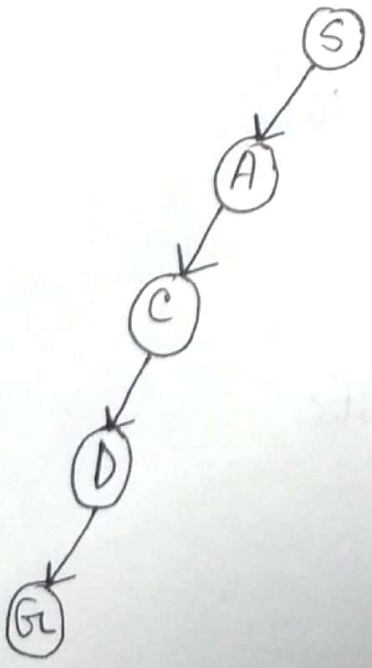
Problem-2

Considering start node as (S) and goal node as (Gr),



This is the search tree of the given problem.

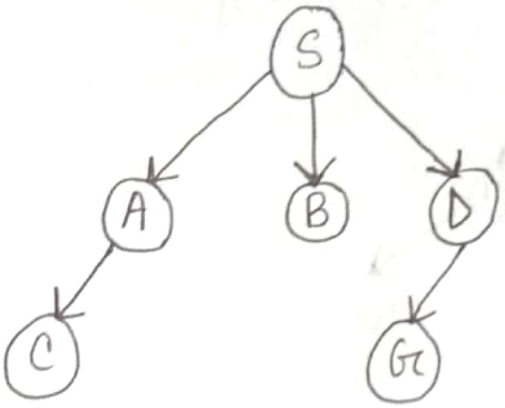
(a) Depth-first search:



States Expanded: S, A, C, D, Gr

Path return: S-A-C-D-Gr

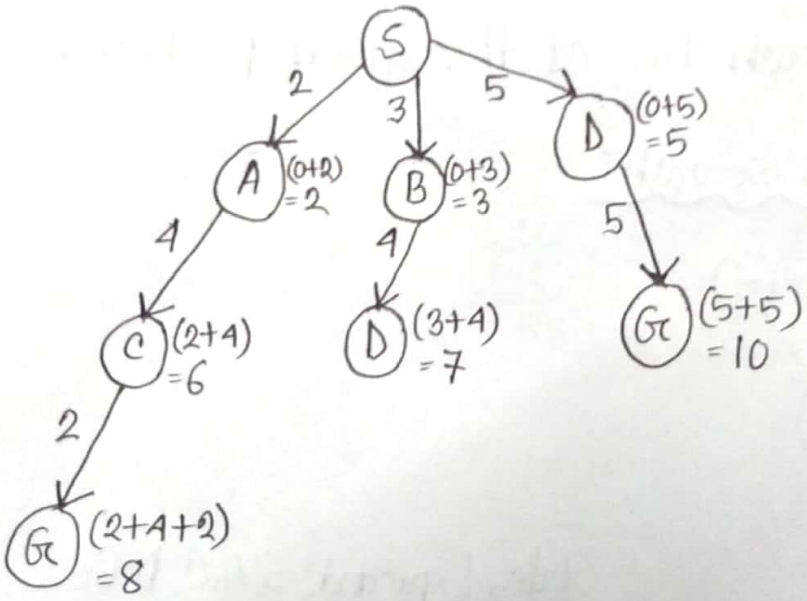
(b) Breadth-first search:



States Expanded: S, A, B, D, C, Gr

Path return: S–D–Gr

(c) Uniform cost search:



States Expanded: S, A, B, D, C, Gr

Path return: S–A–C–Gr