

1) a) BFS:

$$1 + b + b^2 + b^3 + b^4 + \dots + b^d = \sum_{n=1}^d (b)^{n-1}$$

$$S_d = \frac{(1 - b^d)}{1 - b} \rightarrow \text{Nodes expanded}$$

b) DFS

$$= 1 + b + b^2 + \dots + b^m - b - b^2 - b^3 - \dots - b^{m-d}$$

c) ~~DFS~~ PLS

$$= 1 + b + b^2 + b^3 + \dots + b^d$$

d) IDFS

$$1$$

$$1 + b$$

$$1 + b + b^2$$

$$1 + b + b^3$$

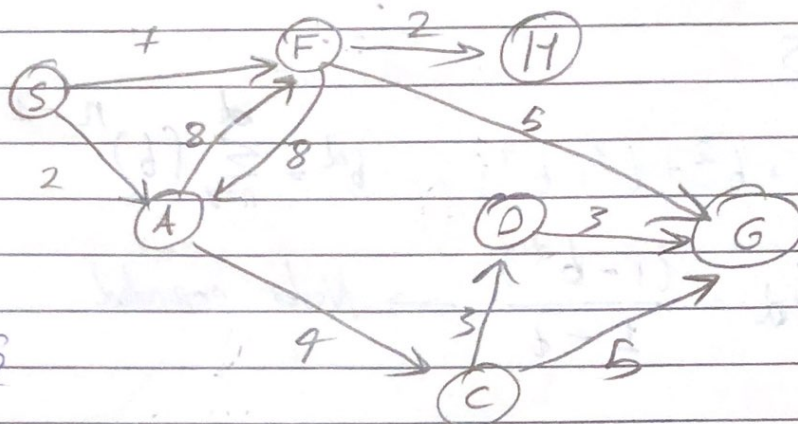
$$1 + b^2 + b^3 + \dots + b^d$$

$$(d+1) + d \times b + (d-1) \times b^2 + (d-2) \times b^3 + \dots + b^d$$

$$\sum_{n=1}^d (d+2-n)(b)^{n-1}$$

$$S = \frac{(d+2-n)(1-b^d)}{1-b}$$

2

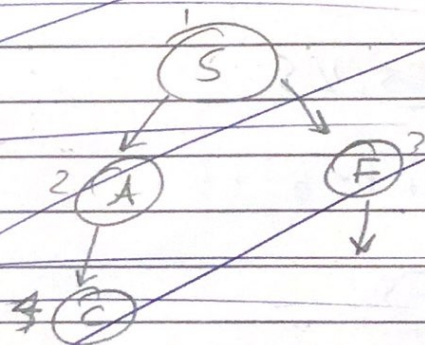


S → G

a)

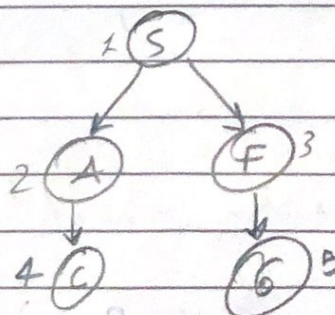
Queue	Visited
<del>S</del>	<del>S</del>
<del>A</del>	<del>A</del>
<del>F</del>	<del>F</del>
<del>C</del>	<del>C</del>
<del>H</del>	<del>H</del>
<del>D</del>	<del>D</del>
<del>G</del>	<del>G</del>

S → A → F → C → H → D → G



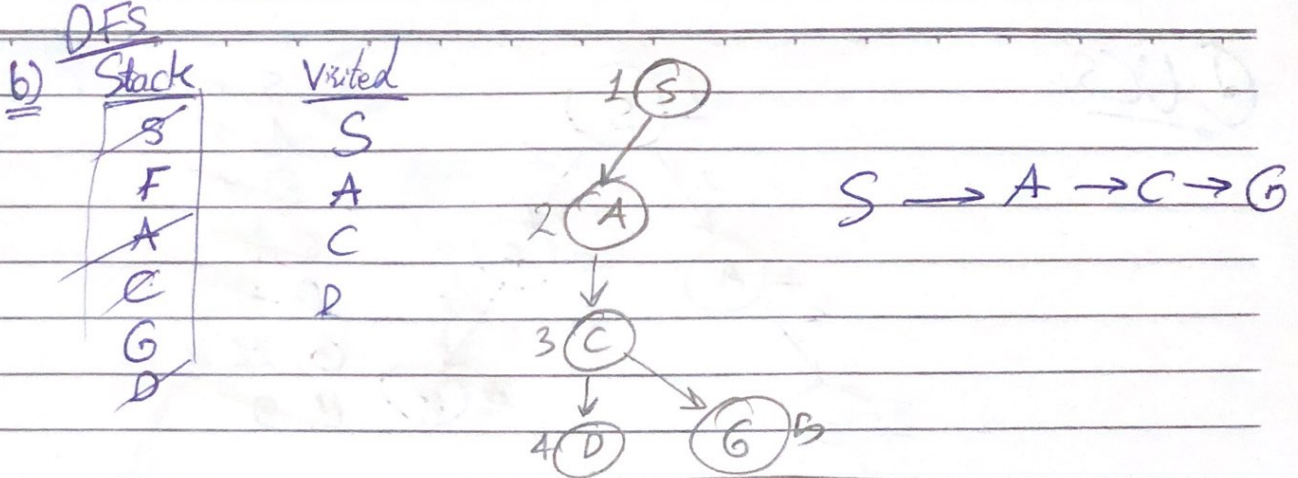
a)

Queue	Visited
<del>S</del>	<del>S</del>
<del>A</del>	<del>A</del>
<del>F</del>	<del>F</del>
<del>C</del>	<del>C</del>
<del>G</del>	<del>G</del>
D	

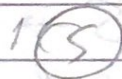
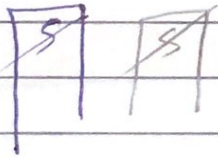


S → F → G

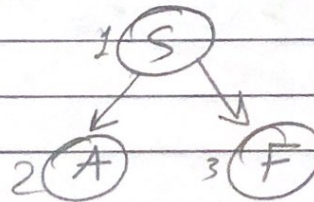


c) IDFS

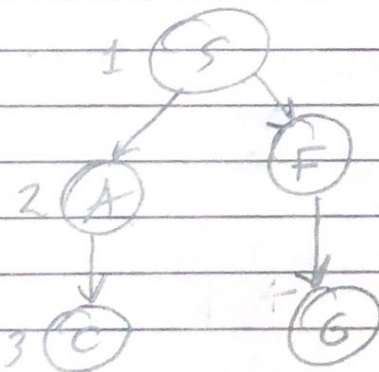
Depth = 1



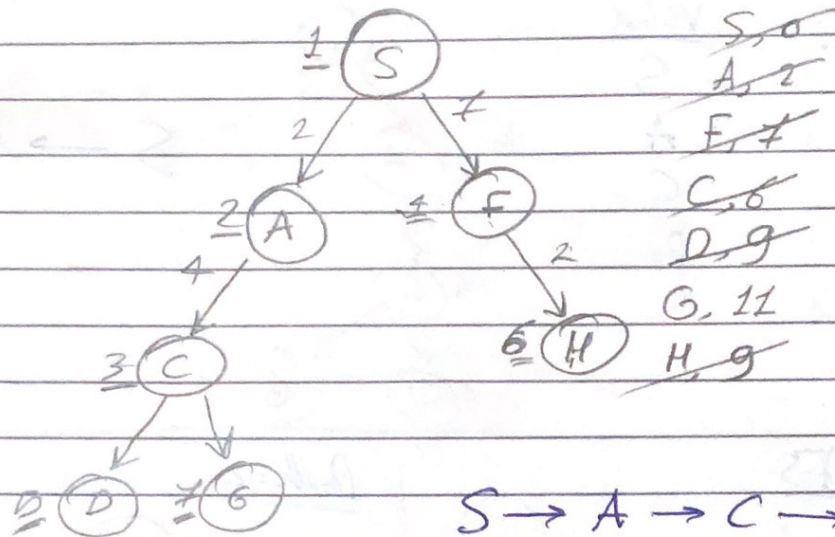
Depth = 2



Depth = 3

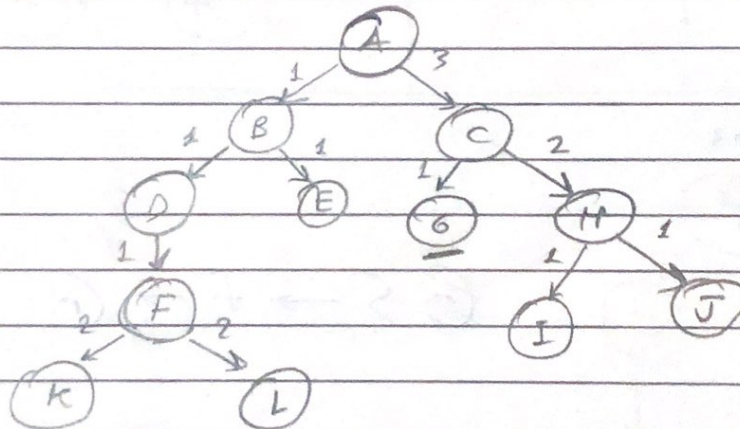
~~G~~  $S \rightarrow F \rightarrow G$

Q1 UCS:-



$S \rightarrow A \rightarrow C \rightarrow G$

Cost = 11



BFS: A - B - C - D - E - G

DFS: A - B - D - F - K - L - E - C - G

IDFS: 0  $\Rightarrow$  A

1  $\Rightarrow$  A - B - C

2  $\Rightarrow$  A - B - D - E - C - G

Uniform CS: A - B - D - E - C - F - G



4