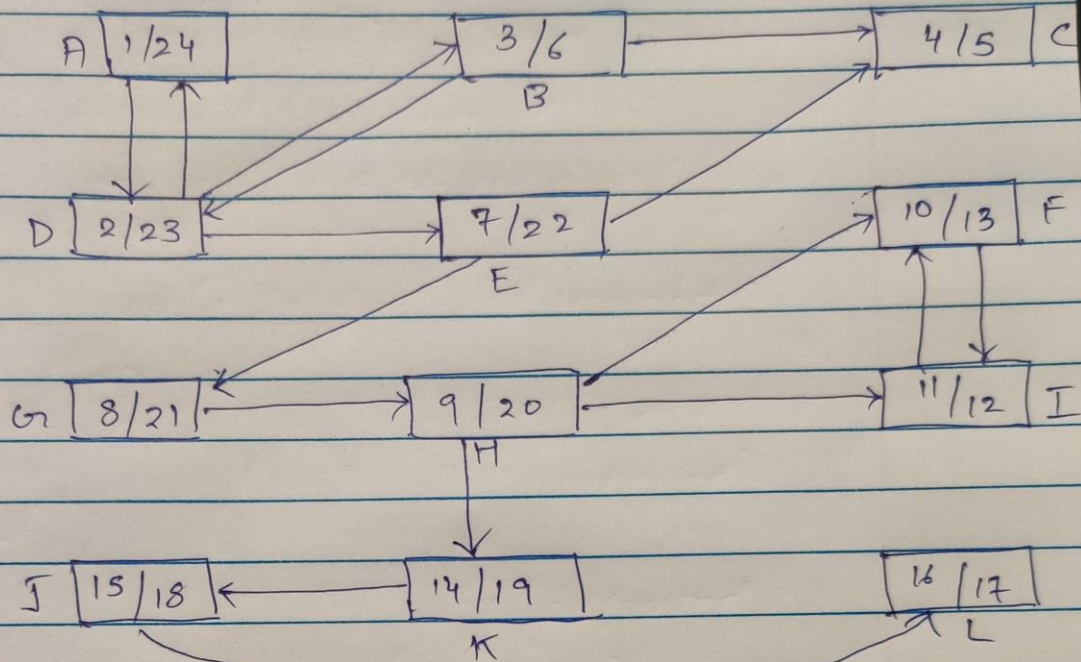**CS590 – Algorithms Assignment 5**
Name: Sushant Bhat
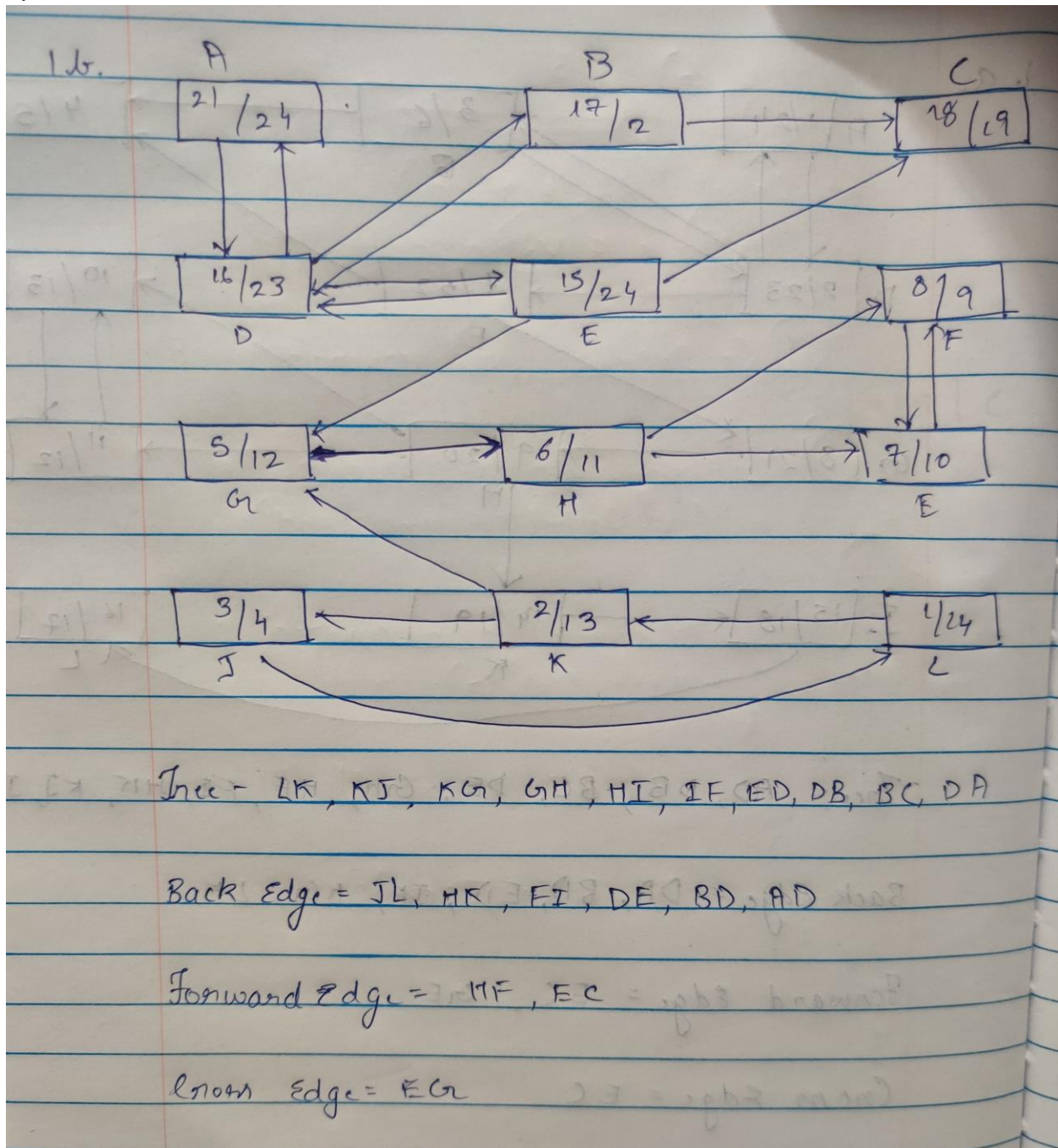**CWID: 10474365**

Q1 a.

1. a.

Tree = AD, DB, BC, DE, GH, HF, FI, HK, KJ, JL

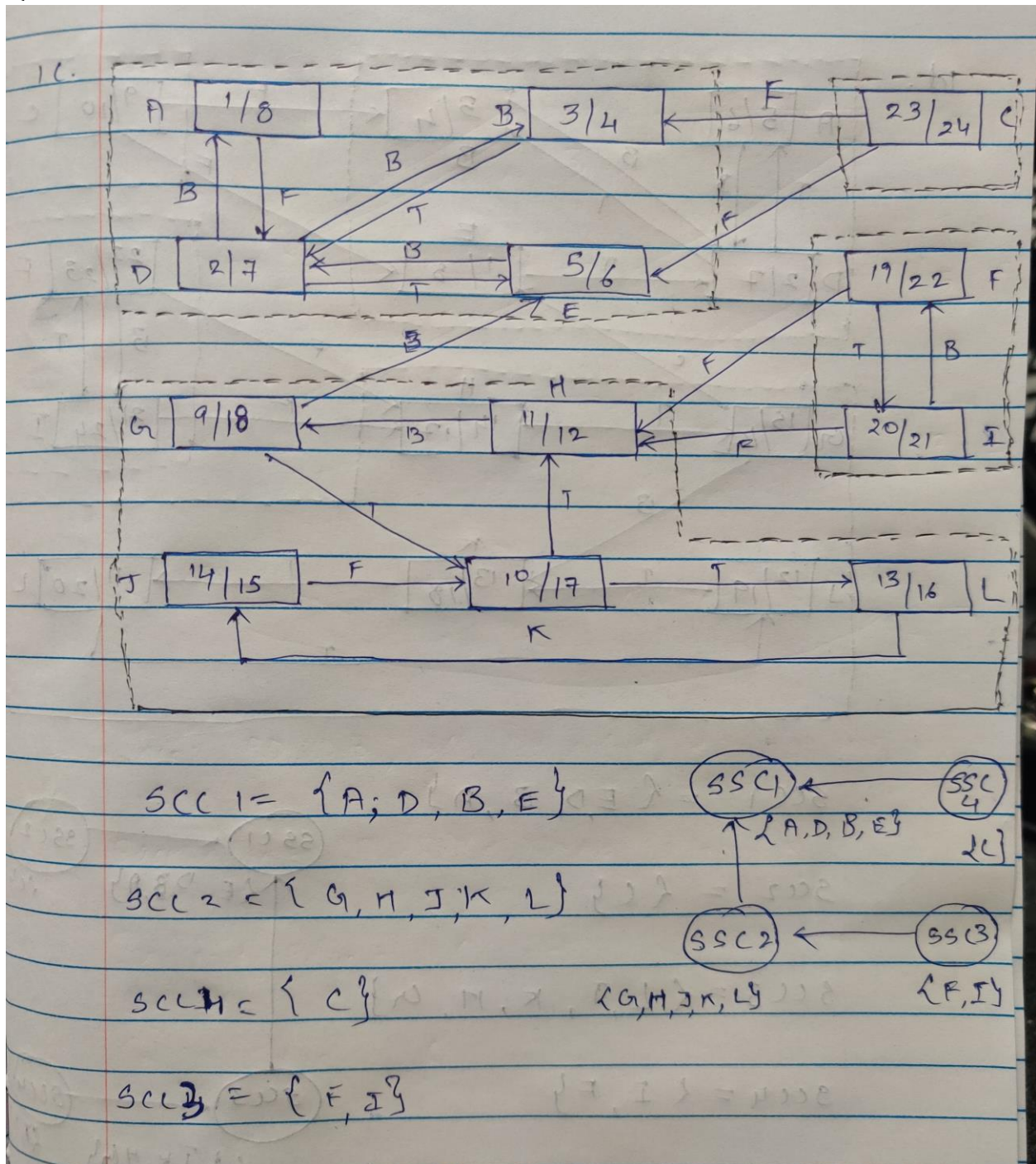Back Edge = DA, BD, ED, IF, KG, LK

Forward Edge = EC, GE

Cross Edge = EC

Q1 b.

1 b.

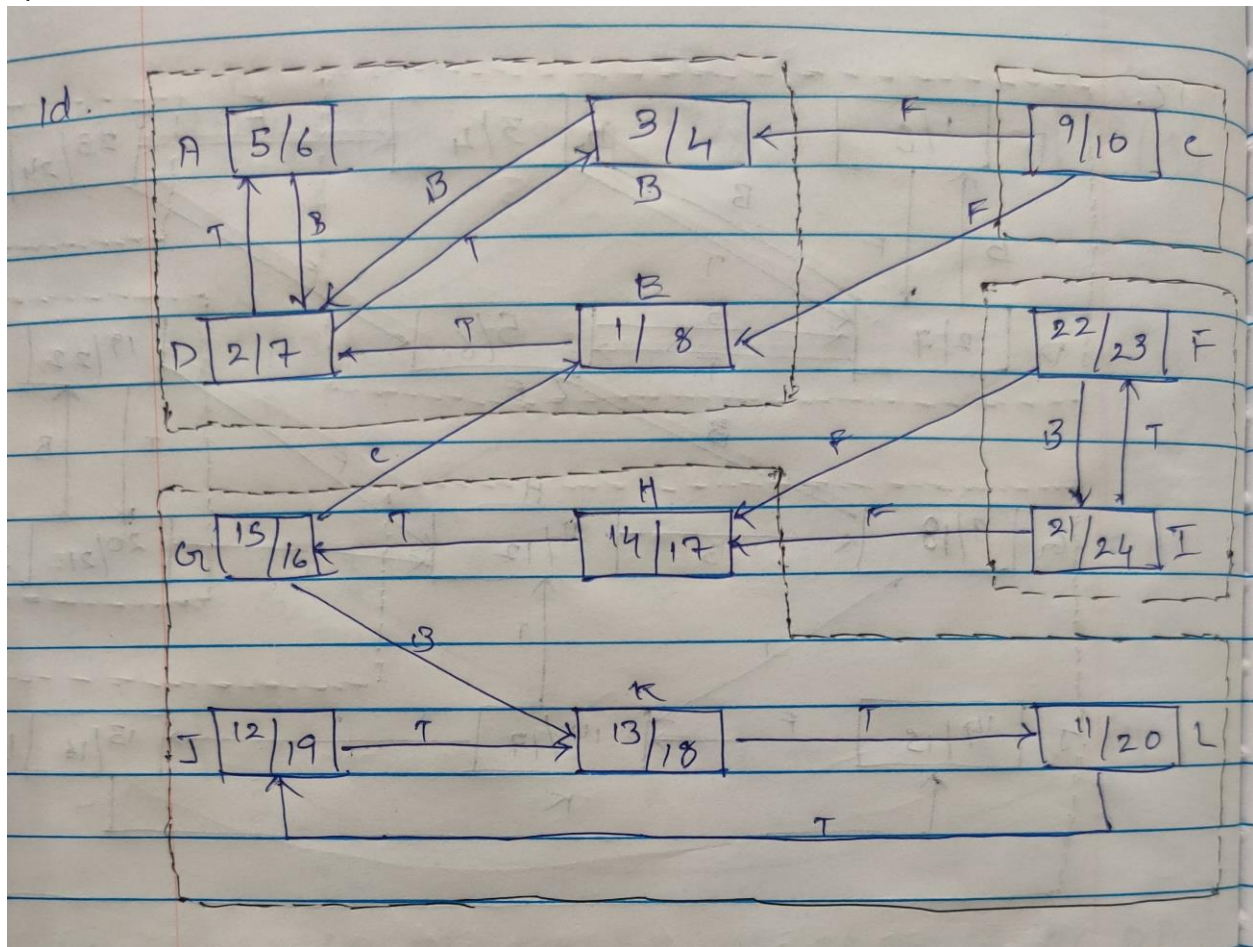A — 21/24   B — 17/2   C — 18/19

D — 16/23   E — 15/24   F — 8/9

G — 5/12   H — 6/11   E — 7/10

J — 3/4   K — 2/13   L — 1/24

Tree - LK, KJ, KG, GH, HI, IF, ED, DB, BC, DA

Back Edge = JL, HK, FI, DE, BD, AD

Forward Edge = HF, EC

Cross Edge = EG

Q1 c.

1 c.

A $1/8$ B $3/4$ F $23/24$ C

B   F   B   T   F

D $2/7$ B $5/6$ $19/22$ F

T   E   T   B

E   F

G $9/18$ H $11/12$ $20/21$ I

13   R

T   T

J $14/15$ F $10/17$ T $13/16$ L

K

SCC 1 = {A, D, B, E}   (SSC1) ← (SSC 4)

{A, D, B, E}   {c}

SCC 2 ⊂ {G, H, J, K, L}

(SSC2) ← (SSC3)

SCC 4 ⊂ {c}   {G, H, J, K, L}   {F, I}

SCC 3 = {F, I}

Q1 d.

Id.

A $5/6$

D $2/7$

$3/4$ B

$1/8$

F $9/10$ C

$22/23$ F

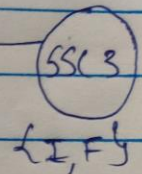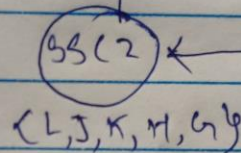G $15/16$

$14/17$ H

$21/24$ I

J $12/19$

$13/18$

$11/20$ L

$SCC1 = \{E, D, B, A\}$

$SCC2 = \{L, J, K, H, G\}$

$SCC3 = \{I, F\}$

$SCC4 = \{C\}$

SSC1 $\{E, D, B, A\}$ ← SSC4 $\{C\}$

SSC2 $\{L, J, K, H, G\}$ ← SSC3 $\{I, F\}$
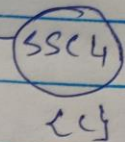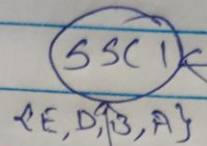
Q2.

```
BFS output:
 0   1   2   3   5   4   7   6
DFS output:
 0   1   2   5   7   3   4   6   8   9
```