Name: Nimra Amer   ROLL NO: 21L-5609
Section: BDS - 6A

Mid-1 (2019)

Question NO.1:

(a)

i) $A \to B = 30 + 22 = 52$

$A \to K = 20 + 30 = 50$

$A \to E = 17 + 29 = 41$

$E \to C = 5 + 30 + 12 = 47$

$C \to D = 29 + 5 + (12 + 5) = 51$
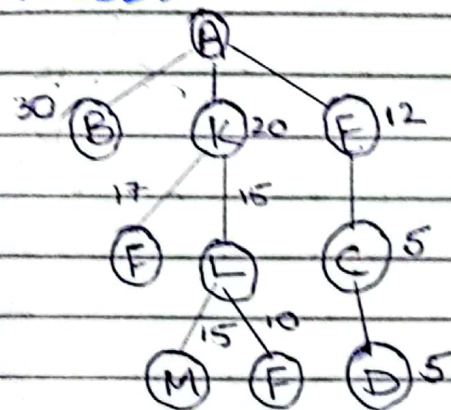
$K \to F = 30 + 17 + 20 = 67$

$K \to L = 15 + 15 + 20 = 50$

$L \to M = 0 + 15 + 15 + 20 = 50$

$L \to F = 30 + 10 + 35 = 75$

Tree:

ii) Path: $A \to K \to L \to M$, Cost: 50

(b)

$A \to K = 60 + 20 = 80$

$A \to B = 10 + 30 = 40$

$A \to E = 10 + 12 = 22$

$C \to D = 20 + 5 + (5 + 12) = 42$

$E \to C = 50 + 5 + 12 = 67$

$D \to F = 30 + 5 + (10 + 12) = 57$

$F \to K = 60 + 15 + 12 = 90$

$F \to L = 20 + 10 + 15 + 12 = 57$

$B \to F = 30 + 19 + 30 = 79$

$B \to H = 30 + 11 + 30 = 71$
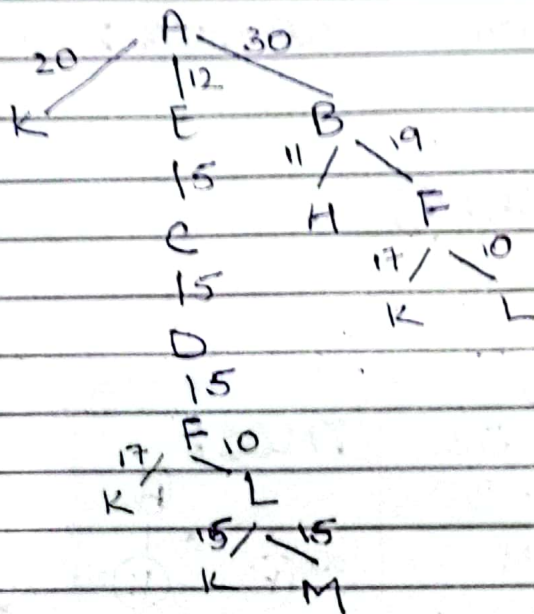
$F \to L = 10 + 15 + 12 + 20 = 57$

$F \to K = 60 + 17 + 15 + 12 = 104$

$L \to K = 60 + 15 + 10 + 15 + 12 = 112$
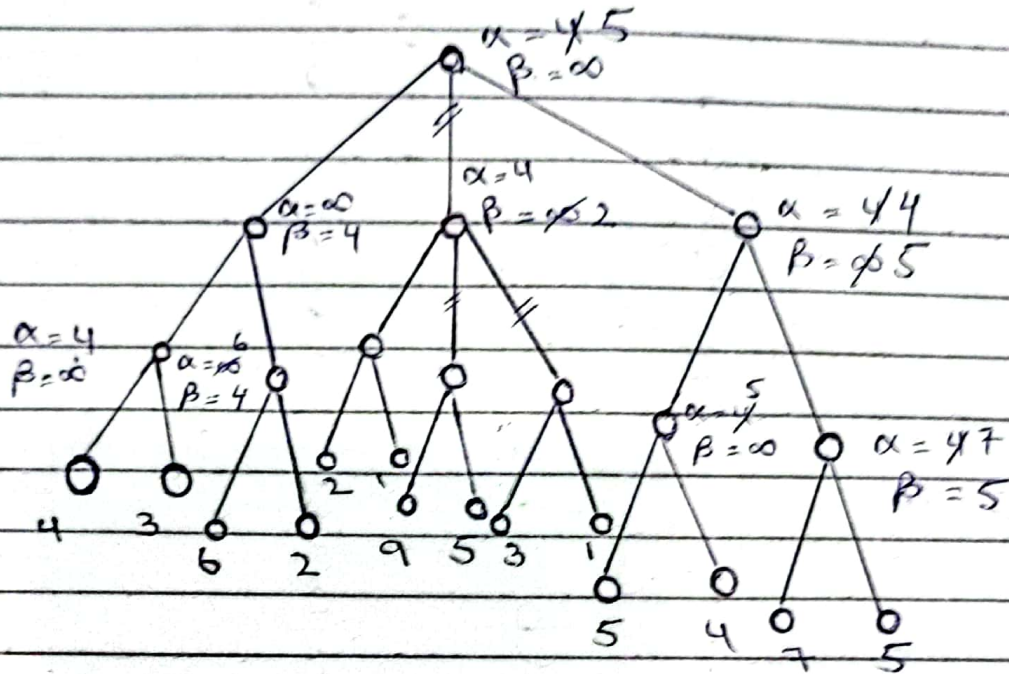
$L \to M = 0 + 15 + 10 + 15 + 12 = 52$

Tree:

(c)

Question No·2:

Max

Min

Max

The diagram shows an alpha-beta pruning minimax tree with nodes labeled:

Root (Max): $\alpha = 4\,5$, $\beta = \infty$

Second level (Min):
- $\alpha = \infty$, $\beta = 4$
- $\alpha = 4$, $\beta = 4\,2$
- $\alpha = 44$, $\beta = \cancel{\phi}5$

Third level (Max):
- $\alpha = 4$, $\beta = \infty$
- $\alpha = \infty$, $\beta = 4$
- $\alpha = 4$, $\beta = \infty$
- $\alpha = 47$, $\beta = 5$

Leaf values: 4, 3, 6, 2, 9, 5, 3, 1, 5, 4, 7, 5

Question No·3:

2	8	3	L0
1		4	
7	6	5	

L1				
2 3		2 8 3	2 8 3	2 8 3
1 8 4		1 6 4	1 4	1 4
7 6 5		7 5	7 6 5	7 6 5

L2						
2 3	2 3	2 8 3	2 8 3	2 8 3		2 8 3
1 8 4	1 8 4	1 6 4	1 6 4	7 1 4		1 4 5
7 6 5	7 6 5	7 5	7 5	6 5		7 6

					8 3	2 8
					2 1 4	1 4 3
					7 6 5	7 6 5
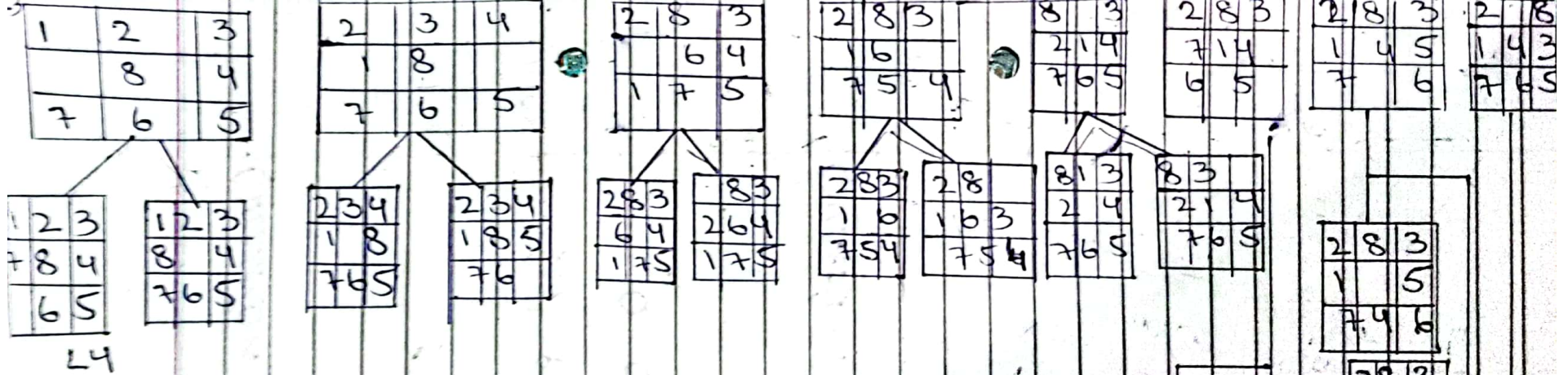
Part-b

Path: $(1,1) \rightarrow (0,1) \rightarrow (0,0) \rightarrow (1,0) \rightarrow (1,1)$

ULDR

Part-c

$(1,1) = 4$ $(1,2) = 3$ $(2,0) = 4$

$(0,1) = 3$ $(2,2) = 4$

$(2,1) = 3$ $(0,0) = 4$

$(1,0) = 4$ $(0,2) = 4$