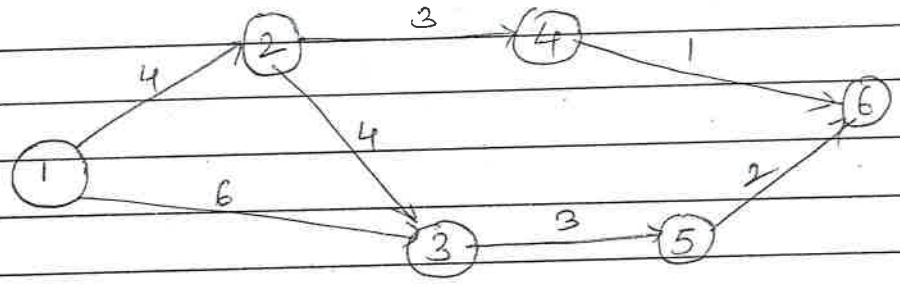
00068240 (1)

Q 1. (a) 2 marks each.

(i) (d) all of the above
(ii) (b) it lies on the critical path.
(iii) (d) all of the above
(iv) (a) there is saddle point
(v) (d) all of the above
(vi) (a) decision tree
(vii) (c) maximum EMV

Q. 2. (i)

(ii)

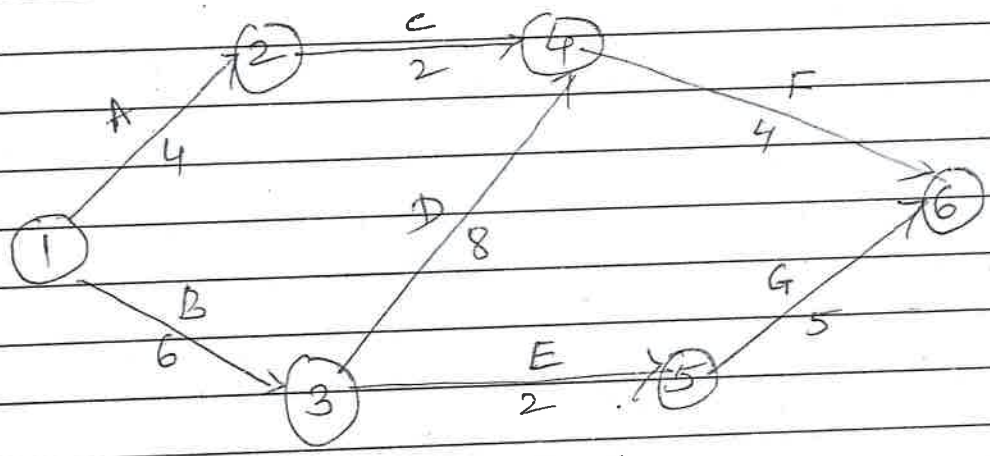


Critical Path 1-2-3-5-6
expected project completion time = 13 days -(5)

Activity	1-2	1-3	2-3	2-4	3-5	4-6	5-6	
te	4	6	4	3	3	1	2	-(2)
Variance	0.44	1	1	0.11	0.44	0	0.11	-(3)

(iii)

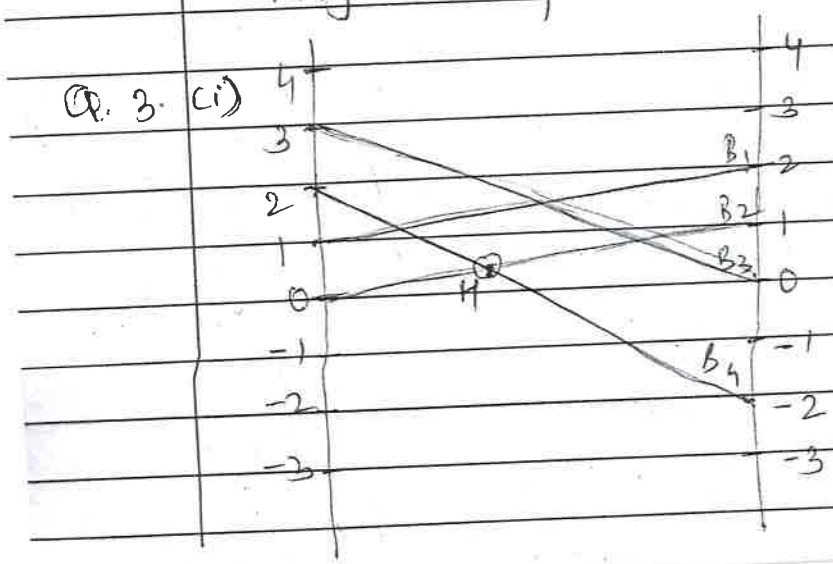
(b)



-(3)

Critical Path - B-E-G -(1)
Project completion time = 13 days -(1)

Q. 3. (i)



$$S_A = \begin{bmatrix} A_1 & A_2 \\ 2/5 & 3/5 \end{bmatrix}$$

$$S_B = \begin{bmatrix} B_1 & B_2 & B_3 & B_4 \\ 0 & 4/5 & 0 & 1/5 \end{bmatrix}$$

Value of the game $= \frac{2}{5}$

(2)

Q 3. (iii)

(a)

Player A	Player B B_1	B_2	B_3	Row minimum
A_1	2	4	5	2
A_2	10	[7]	9	[7] maximin
A_3	4	7	(6)	4
column max.	10	7	(6)	
			minimax	

There exists no unique saddle point.
∴ saddle point will exist at position (2, 2) only when $p \leq 7$ and $q \geq 7$.

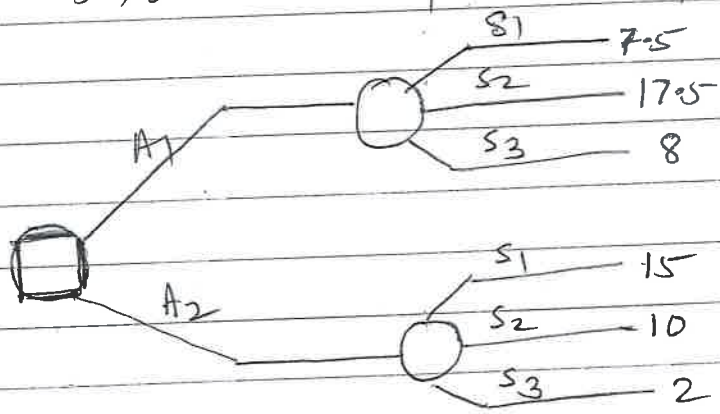
Q 4. (ii)

(a) 1. maximin criterion
Best act - regular - payoff 10

2. minimax regret
Best act - supreme - payoff 15

3. Laplace criterion
Best act - supreme - payoff 31.67

(b)



maximum EMV = 33
Best act is A_1

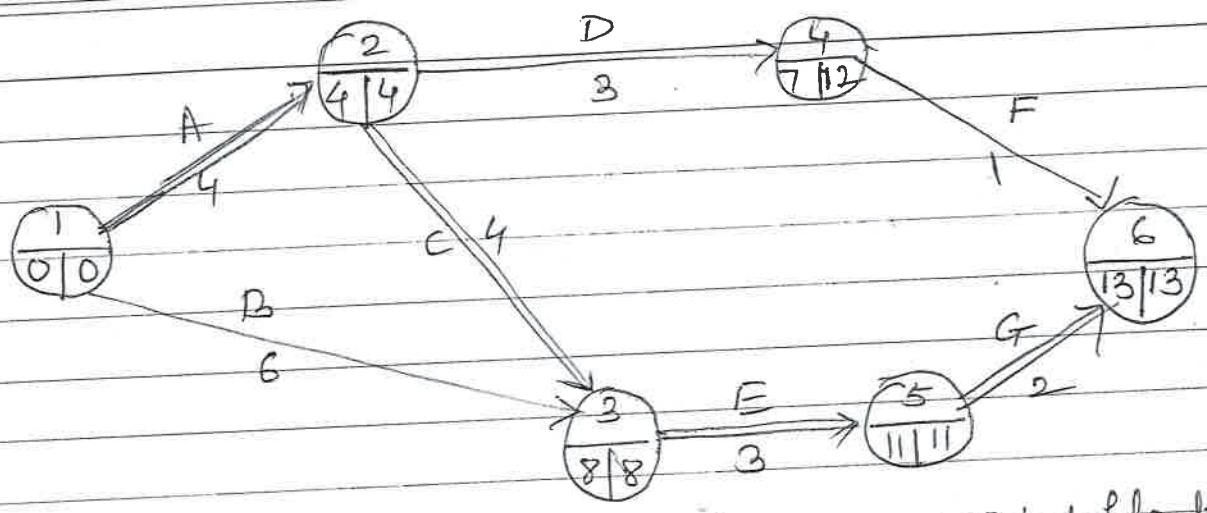
(iii)

(b)

State of nature	Prob.	Opportunity loss A_1	A_2	A_3	A_4	Expected opp. loss A_1	A_2	A_3	A_4
S_1	0.15	350	0	450	400	52.5	0	67.5	60
S_2	0.45	0	300	100	0	0	135	45	0
S_3	0.25	450	200	300	0	112.5	50	75	0
S_4	0.15	50	100	0	100	7.5	15	0	15
						172.5	200	187.5	75

minimum EOL = 75
∴ Best act is A_4

Q5. (i)



Activity	Duration	EST	EFT	LST	LFT	Total float LST − EST
A	4	0	4	0	4	0
B	6	0	6	2	8	2
C	4	4	8	4	8	0
D	3	4	7	9	12	5
E	3	8	11	8	11	0
F	1	7	8	12	13	5
G	2	11	13	11	13	0

Critical Path − A − C − E − G

Duration = 13 days.

(ii) The game does not have a saddle point.

1st reduced payoff matrix

A \ B	II	III	IV
II	4	2	4
III	2	4	0
IV	4	0	8

2nd reduced payoff matrix

A \ B	III	IV
II	2	4
III	4	0
IV	0	8

3rd reduced payoff matrix

A \ B	III	IV
III	4	0
IV	0	8

optimal strategy for player A = (0, 0, 2/3, 1/3)

optimal strategy for player B = (0, 0, 2/3, 1/3)

value of the game to the player A = 8/3