A network diagram with activity nodes A, B, C, D, E, F, G, H and durations, followed by a Gantt/bar chart grid.

Nodes (duration shown):
- A: 3
- B: 4
- C: 5
- D: 4
- E: 5
- F: 3
- G: 2
- H: 1

Grid columns numbered: 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

Bottom row values: 2 2 2 2 2 2 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 .

SCHEDULE INFORMATION				BASELINE BUDGET (BEEHS)	LABOR HOURS (BH)														
DUR	ES	LF	SL	TOTAL PV	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
2	0	2	0	20	10	10													
2	2	7	3	24			16	8											
6	2	11	3	30			5	5	10	3	2	4							
2	7	0		25			10	10	2	2	1								
4	11	3		16						4	4	4	4						
7	11	0		20								9	5	6	4				
11	13	0		10												6	6		
PV BY PERIOD					10	10	31	23	16	9	7	14	5	6	4	6	6		
CUMPV BY PERIOD					10	20	51	74	90	99	106	120							

(6. (5 marks)

a) Given a project with activities of an equal level of risk. You need to reduce the overall project duration. Give one reason why would you **not** select the activity with the lowest slope in the same project network to crash first.

b) What are the two strategies for mitigating risks? Give an example for each strategy to support your answer.

c) The following table is a risk assessment form that has been developed by team members of a construction project. Draw the risk severity matrix for it.

Risk event	Likelihood	Impact	Detection difficulty	When
Shortage in workers	4	4	2	Construction
Machine malfunction	4	5	5	Foundation
Materials shortage	2	1	1	Construction
Change in specifications	1	4	2	Design

Q2. (30 marks)

The activity times for a project are given in the table. Use the PERT technique to answer the following:

a) Draw an AON network for the project
b) What is the expected project time for the project?
c) What is the variance of project duration?
d) What is the probability of the project duration (T_s)?
e) What is the probability that the project will be completed before a scheduled time (T_s) of 60?

What is the probability that the project will be completed after a scheduled time (T_s) of 45?

| Activity | Predecessor | Time in work days | | | Weighted average activity time (t_e) |
		Optimistic (a)	Most likely (m)	Pessimistic (b)	
A	None	4	7	10	
B	None	2	4	6	
C	None	16	19	28	
D	A, B	4	7	10	
E	B, C	16	19	28	
F	D, E	1	7	13	
G	E	6	9	24	
H	F, G	2	5	8	

ks)

project with activities of an equal level of risk. You need to reduce the overall project duration
reason why would you not select the activity with the lowest slope in the entire project network
first

are the two strategies for mitigating risks? Give an example for each strategy to support your answer.

following table in a risk assessment form that has been developed by team-members of a construction
Draw the risk severity matrix for it.
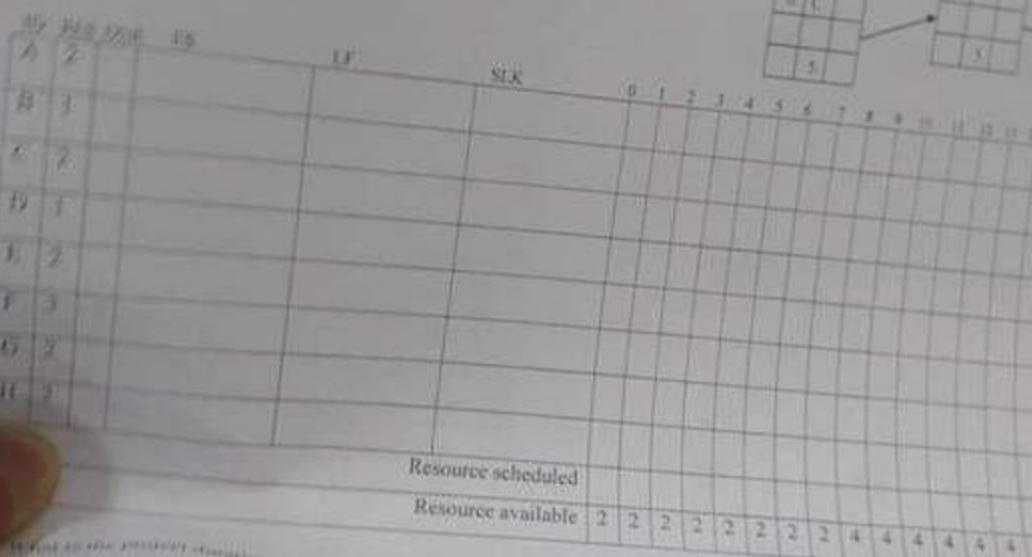
	Likelihood	Impact	Detection difficulty	When
thing	4	4	2	
ecting	4	5	5	Construction
up	2	1	1	Foundation
locations	3	4	2	Construction
				Design

For a project, the key resources is a builder. From period 1 to period 8, there are two builders available to the project. At period 9, the project manager will bring two additional builders. Therefore, from period 9 till the end of project, there will be four builders available.

a) Develop a resource schedule in the loading chart that follows. Use the parallel method and the following heuristics:
- Minimum slack
- Smallest duration
- Lowest identification number

ID	Dur	ES	EF	LS	LF	Slk	0	1	2	3	4	5	6	7	8	9	10	11	12	13
A	2																			
B	3																			
C	2																			
D	1																			
E	2																			
F	3																			
G	2																			
H	2																			

Resource scheduled

Resource available	2	2	2	2	2	2	2	2	4	4	4	4	4	4
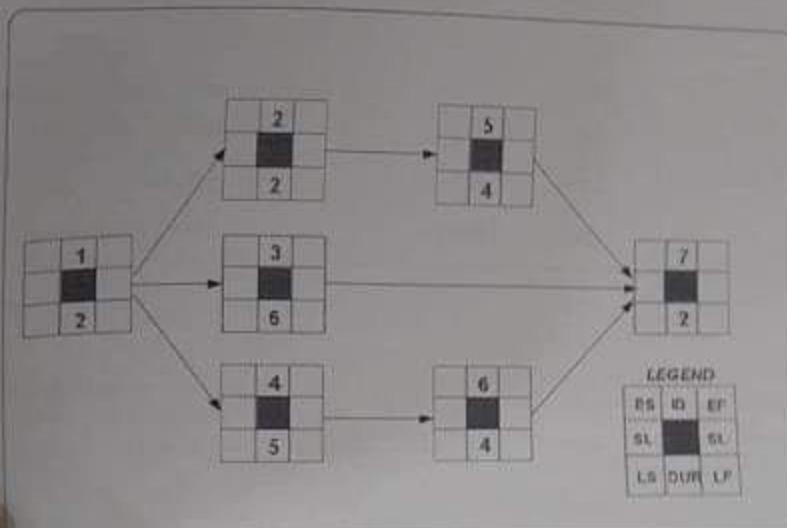
b) What is the project duration after the resource schedule?

The following labor hours data have been collected for a nanotechnology project for periods 1 through 5.
a) Compute SV and CV for each period.
b) Compute SPI, CPI and PCIB for each period.
c) What is your assessment of the project at the end of period 5.

ACT/WP	DUR	ES	LF	SL	TOTAL PV	0	1	2	3	4	5	6	7	8	9	10	11	12	13
1	2	0	2	0	20	10	10												
2	2	2	7	3	24			16	8										
3	6	2	11	3	30			5	5	10	3	2	5						
4	5	2	7	0	75			10	10	2	2	1							
5	4	4	11	3	16					4	4	4	4						
6	4	7	11	0	20							5	5	6	4				
7	2	11	13	0	10												5	5	

Schedule Information / Baseline Budget Needs – Labor Hours (90) / Time Period

TOTAL PV BY PERIOD: 10 10 31 23 16 9 7 14 5 6 4 5 5

CUMULATIVE PV BY PERIOD: 10 20 51 74 95 99 120 135 140 150 525 139 149