Model answer

Name:	Sec:	B.N.:

1. **Which of the following statement is true and which is false**
   a. Defining project scope starts in the planning phase. (False)
   b. Client requirements for additional features may cause scope creep (True)
2. **What are the Common methods of gathering project requirements?**
   - User interviews
   - Bussiness process analysis
   - users workshops
   - Observations
   - Creativity techniques
   - Questionzire Surveys
3. **What are the main information included in project scope statement**
   - must define what work will be done
   - " " " will not be included in project (out of scope)
   - project constraints
   - project assumptons
4. **Why we need to create Work Breakdown Structure (WBS)**
   - provides a solid foundation for planning & scheduling
   - Breaks down projects into managable work packages
   - provides a way to estimate project costs accurately.
   - helps project managers with resource allocation
5. **Mr. Ahmed, president of Shoubra Inc., is considering placing a bid on a building project. It has been determined that 5 tasks would need to be performed to carry out the project.**

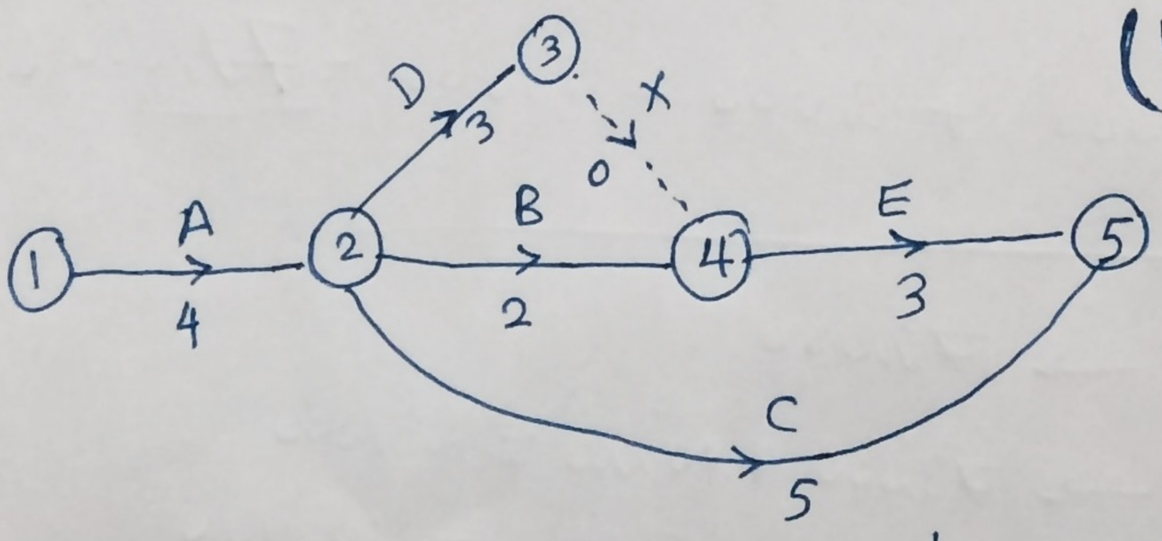
(a) $t_{avg} = \frac{o+4m+p}{6}$ ← use it as normal time

   a. **Calculate the weighted average time estimate for each activity using PERT.**
   b. **Use the weighted average to calculate all possible paths and the critical path using CPM?**
   c. **As a project manager, advice Mr. Ahmed about the proper plan if the project regulations say if you complete the project in 8 weeks or less there will be no penalty, if completed in 9 weeks there is a penalty of 10,000 LE, and if completed in 10 weeks there is a penalty of 20,000 LE.**

Task	Time required			Immediate predecessors	Normal Time	Normal Cost	Crash Time	Crash Cost
	Optimistic Estimate (o)	Most likely (m)	Pessimistic Estimate (p)					
A	3 weeks	4	5	-	4	10,000	4	10,000
B	2	2	2	A	2	5,000	1	7,000
C	4	5	6	~~A~~	5	5,000	4	~~7~~,000
D	1	3	5	A	3	30,000	1	50,000
E	2	3	4	B,D	3	20,000	1	26,000

(a)

(b) Paths
- ABE = 4+2+3 = 9
- ADXE = 4+3+0+3 = 10 ⇒ Cri Pa
- AC = 4+5 = 9



Task	Max Crash Time	Slope
A	0	X
B	1	2,000 LE/day
C	1	2,000
D	2	10,000
E	2	3,000
X	0	X

(C) To prepare the proper plan, we need to Study the possibilty of crashing the critical path →

• To crash 1 day . possible node on critical path (ADEX) are
D & E

. use the min Slope (i.e. E)
crash from 3 to 2 weeks

∴ total normal cost = $(10 + 5 + 5 + 30 + 20) \times 10^3$ (A, B, C, D, E)
= 70,000 LE

total Cost after crash = 70,000 + (3,000) = 73,000
Slope of E

new paths ⇒
ABE = 4+2+(2) = 8
ADXE = 4+3+0+2 = (9)
AC = 4+5 = (9)
→ two critical paths

• To crash (one-more) day:
we need to crash both critical paths together

ADXE
D → 10,000
E → 3,000
نختار الأقل ← E

* Crash E: 2 weeks → 1 week

AC
C → 2,000

* Crash C: 5 weeks → 4 week

new paths
ABE = 4+2+(1) = 7
ADXE = 4+3+0+(1) = 8
AC = 4+(4) = 8

∴ total Cost = 73,000 + 3,000 + 2,000 = 79,000 LE

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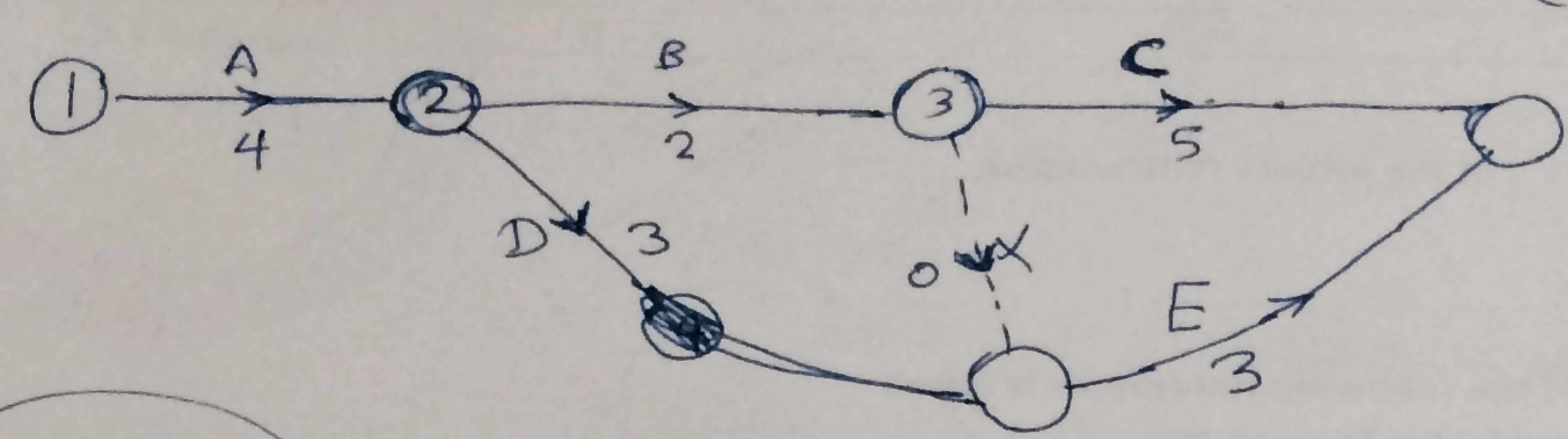
8 days → no penalty → 79,000
9 days → 10,000 penalty → 73,000 + 10,000 = 83,000
10 days → 20,000 penalty → 70,000 + 20,000 = 90,000
∴ it is better economically to crash to 8-days

((Second version)) ⇒ the only differenc is that C depend on B (not A)



A → –
B → A
D → A
C → B
E → B, D

paths

Path	Duration		
ABC	= 4 + 2 + 5	=	11 critical
A BxE	= 4 + 2 + 0 + 3	=	9
A DE	= 4 + 3 + 3	=	10

To prepare the proper plan

⇒ Crash critical path by 1 week:

ABC
- A → no crash x
- B → 2000 LE/week
- C → 2,000 LE/week

it is possible to Crash either B or C

∴ Crashing B from 2 : 1 week (can't crash more)

∴ total cost = 70,000 + 2,000 = 72,000 LE

new paths

ABC = 4 + (1) + 5 = (10)
ABxE = 4 + (1) + 0 + 3 = 8
ADE = 4 + 3 + 3 = (10)

two critical paths

ABC: A → x, B → ~~2000~~ x, C → (2,000)

ADE: A → x, D → 10,000, E → (3,600)

∴ Crash C & E

total cost = 72,000 + 2,000 + 3,000 = 77,000

new paths

ABC = 4 + 1 + (4) = (9)

ABXE = 4 + 1 + 0 + (2) = 7

ADE = 4 + 3 + (2) = (9)

Still two critical paths

but C is crashed to its max value
& A, B can't be crashed Also any more

∴ So, ABC can't be crashed
So, it is no use to crash the other path (ADE)

6i Conclusion

For 11 days

70,000 + 20,000 penalty = 90,000

↓ The same as 10 weeks

For 10 days

72,000 + 20,000 penalty = 92,000

For 9 days

77,000 + 10,000 penalty = 87,000

best plane