Benha University
Faculty of Engineering at Shoubra
Electrical Engineering Department
Second Year (Elec. & Communication)

Final Term Exam
Date: 14/1/2016
Subject: Project Management
Duration: 2 Hours

Answer all the following questions || No. of questions :4 || Total Mark: 40 Marks

Model Answer

Question (1) (10 Marks)

Which of the following statement is true and which is false and correct the false?

a. **Defining project scope starts in the planning phase.**

False
In the concept phase

b. **Client requirements for additional features may cause scope creep**

True

c. **Each activity could be crashed until its duration becomes zero**

False,

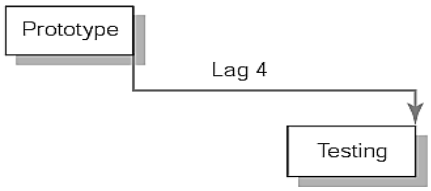
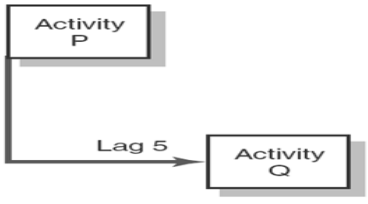
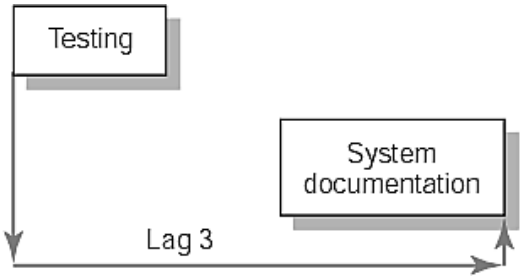
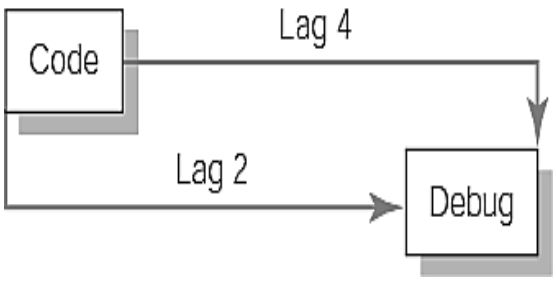
- ✓ **it reaches it's maximum time reduction or**
- ✓ **it causes another path to also become critical or**
- ✓ **it is more expensive to crash than not to crash**

d. **AOA is a network diagramming technique in which boxes represent activities.**
False, arrows represent the activity

e. **A slipped milestone means the milestone activity was actually completed on the originally planned time.**
False, completed after the originally planned time

Question (2) (10 Marks)

Specify the types of the relationships in the following figures:

<table>
<tr><td> 
</td><td> 
</td></tr>
<tr><td>(a) Finish-to-Finish with 4 days between them</td><td>(b) start-to-start with 5 days between them</td></tr>
<tr><td> 
</td><td> 
</td></tr>
<tr><td>(c)start-to-Finish with 3 days between them</td><td>(d) combined: start-t-start with 2 days</td></tr>
</table>

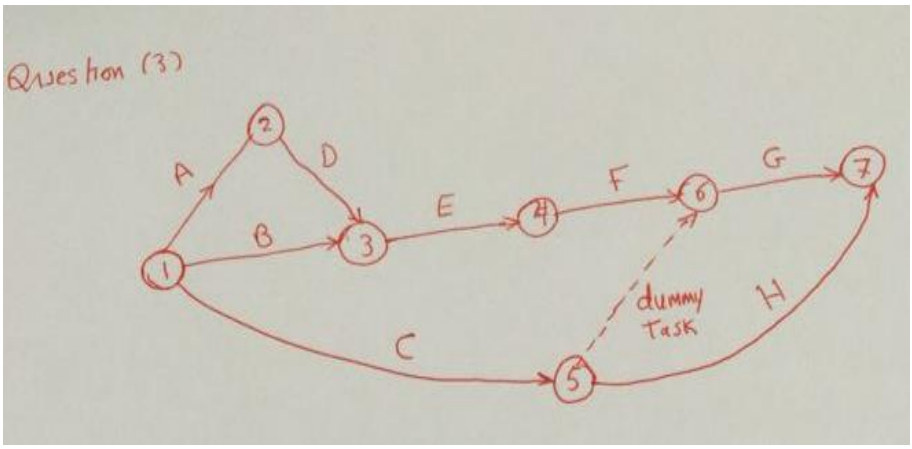
	and **finish to finish with 4 days between them**

Question (3) (8 Marks)

Draw the AOA diagram of the following network.

Task	Precedence
A	-
B	-
C	-
D	A
E	B,D
F	E
G	F,C
H	C

Answer



Question (4) (12 Marks)

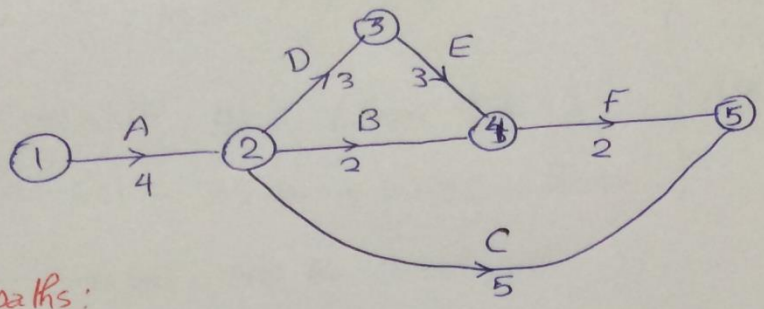
An organization is considering placing a bid on a building project. It has been determined that the 6 tasks in the following table would need to be performed to carry out the project.

a. **What is the expected date to finish the project if the project starts 1/1/2016 and the organization works 5 days/week at Egypt and there is a national holiday at 7th of January?**
b. **As a project manager, advice the managers about the proper plan to achieve the minimum cost if the project regulations say if you complete the project in 8 days or less there will be no penalty, if completed in 9 days there is a penalty of 10,000 LE, if completed in 10 days there is a penalty of 15,000 LE, and if completed in 11 days there is a penalty of 20,000 LE.**

Task	Immediate predecessors	Normal Time	Normal Cost	Crash Time	Crash Cost
A	-	4	10,000	4	10,000
B	A	2	5,000	1	7,000
C	A	5	5,000	4	7,000
D	A	3	30,000	1	50,000
E	D	3	5,000	2	5,000
F	B,E	2	20,000	1	26,000

Question (4) Answer

Activity-on-Arrow (AOA) Diagram:



⇒ possible paths:

ABF = 4+2+2 = 8
ADEF = 4+3+3+2 = 12 → the longest is the critical path
AC = 4+5 = 9

)) The project will be completed in (12 days)

Start: 1/1/2016
end: 19/1/2016

	Slope	max. Crash Time
A	X	0
B	2,000	1
C	2,000	1
D	10,000	2
E	zero	1
F	6,000	1

)) Activity crashing:

Total Cost = 10,000 + 5,000 + 5,000 + 30,000 + 5,000 + 20,000
= 75,000 LE

⇒ We crash the activity with lowest slope on the critical path: (ADEF)

E can be crashed with No cost (zero slope). From 3 to 2 da

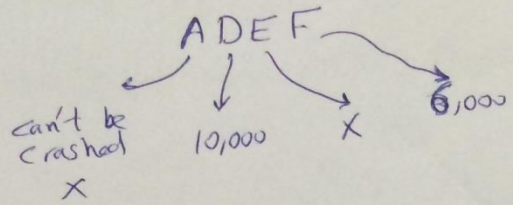
∴ Total Cost = 75,000 + 0 = 75,000

ADEF still the critical path

new paths

ABF = 4+2+2 = 8
ADEF = 4+3+2+2 = (11)
AC = 4+5 = 9

• To Crash one more day:



∴ Crash F by 1 (From 2 to 1)

Total Cost = 75,000 + 6,000 = 81,000

• New paths:

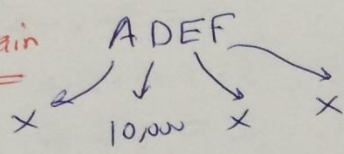
ABF = 4+2+1 = 7

ADEF = 4+3+2+1 = (10)

AC = 4 + 5 = 9

ADEF Still the critical path.

• Crash again



∴ Crash D From 3 to 1

Total Cost = 81,000 + 10,000 = 91,000

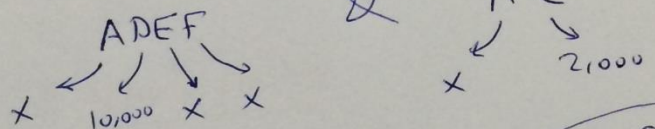
New paths:

ABF = 4 + 2+1 = 7

ADEF = 4+2+2+1 = (9)

AC = 4+5 = (9)

we have now, two critical paths, that must be crashed simultaneously.



Crash D From 2 to 1 & Crash C from 5 to 4

total Cost = 91,000 + 10,000 + 2,000 = 103,000

New paths → ABF = 7

ADEF = (8)

AC = (8)

⇒ Can't Crash any more, So ⇒

days	Cost	penalty	Total
12	75,000	20,000	95,000
11	75,000	20,000	(95,000)
10	81,000	15,000	96,000
9	91,000	10,000	101,000
8	103,000	Zero	103,00

So the best choice is to crash to 11 day only