

**Question No. 1 (10 marks):**

The following table (1) shows the activities dependency, duration, and cost elements for a small construction project. It is required to draw the net cash flow diagram for the given project below. Assuming that:

- Project overhead 10% of the total direct cost.
- Profit 15 %
- Tax 3%
- Bond 1%
- Down Payment 20% for the main contractor and the subcontractors
- Invoices are submitted every month and will be paid a month later.
- Labor expenses to be paid monthly.
- Material expenses to be paid: 50% upon delivery and 50% a month later; assuming that the material will be delivered just when needed.
- Equipment expenses will be paid a month later.

Table (1)

Activity	Depends on	Duration (months)	Labor costs	Material costs	Equipment costs	Subcontractors cost
A	----	1	3000	-----	3000	-----
B	A	2	1000	4000	10000	-----
C	A	3	3000	2000	4000	-----
D	A	4	-----	-----	-----	5000
E	B & C	2	1000	3000	2000	-----
F	D & E	2	3000	2000	4000	

**Answer:**

	Dura	L	M	E	S	DC	Bid	/month	0.20
A	1	3000	-----	3000	-----	6000	7896	7896	6317
B	2	1000	4000	10000	-----	15000	19740	9870	7896
C	3	3000	2000	4000	-----	9000	11844	3948	3158
D	4	-----	-----	-----	5000	5000	6580	1645	1316
E	2	1000	3000	2000	-----	6000	7896	3948	3158
F	2	3000	2000	4000		9000	11844	5922	4738
						DC 50000			
						0.10 IC 5000	55000	1.32	
						0.03 tax 1650	56650		
						0.15 profit 8498	65148		
						0.01 bond 651	65799		

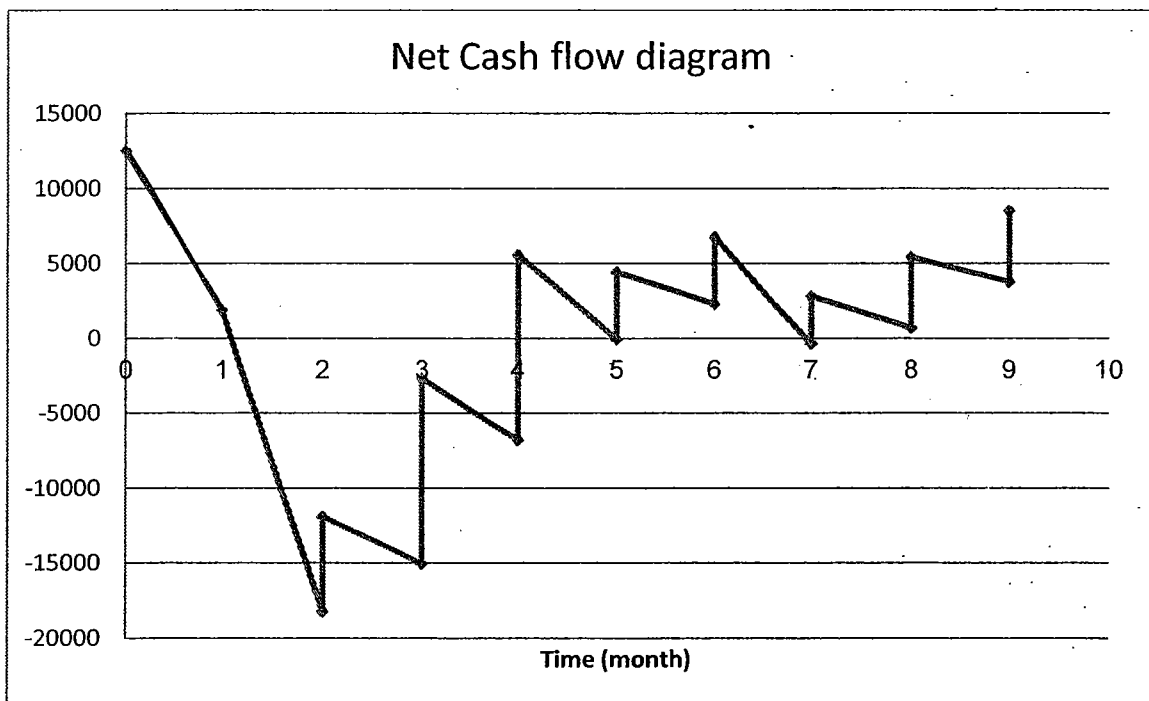
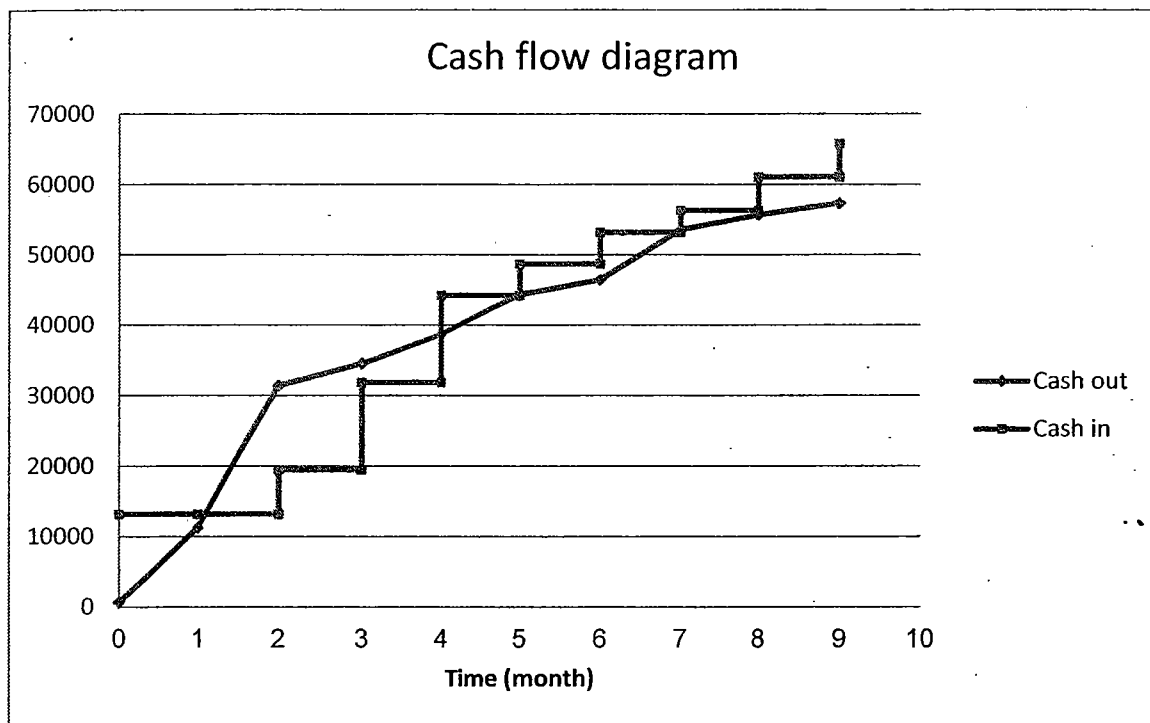
	0	1	2	3	4	5	6	7	8	9
A		3000 3000								
B		2000	500 2000 10000	500						
C		1000	1000 1000 4000	1000	1000					
D		1000	1000	1000	1000	1000				
E					1500	500 1500 2000	500			
F							1000	1500 1000 4000	1500	
	651									1650

Cost	651	10000	19500	2500	3500	5000	1500	6500	1500	1650
I.C.		625	625	625	625	625	625	625	625	
T.C.	651	10625	20125	3125	4125	5625	2125	7125	2125	1650
	651	11276	31401	34526	38651	44276	46401	53526	55651	57301

Cash in

	0	1	2	3	4	5	6	7	8	9
A			6317							
B				7896	7896					
C				3158	3158	3158				
D				1316	1316	1316	1316			
E							3158	3158		
F									4738	4738
	13160									

13160	0	6317	12370	12370	4474	4474	3158	4738	4738	
13160	13160	19476	31847	44217	48691	53166	56324	61061	65799	





Tax ✓  
Profit ✓  
Bond ✓

Activity	Depends on	Duration (months)	Labor costs	Material costs	Equipment costs	Subcontractor costs	Direct cost
A	---	1	3000	---	3000	---	6,000
B	A	2	1000	4000	10,000	---	15,000
C	A	3	3000	2000	4,000	---	9,000
D	A	4	---	---	---	5000	5000
E	B & C	2	1000	3000	2000	---	6000
F	D & E	2	3000	2000	4000	---	9000
							<u>50,000</u>

- Project overhead 10% =  $50,000 \times 10\% = 5000$

Cost =  $50,000 + 5000 = 55,000$

- Tax 3% =  $55,000 \times 3/100 = 1650 \Rightarrow 55,000 + 1650 = 56,650$  ✓

- Profit = 15%  $56,650 \times \frac{15}{100} = 8497.5 \Rightarrow 56,650 + 8497.5 = 65147.50$  ✓

→ BOND 1% =  $65147.50 \times \frac{1}{100} = 651.5$  ✓

→  $651.5 + 65147.50 = \boxed{65,799}$  القيمة النهائية

Factor =  $\frac{65,799}{50,000} = 1.32$  ✓

BID	BID	BID/Month	Downpayment: BID/Month X 0.8
A	7920	7920 ✓	6336 ✓
B	19800	9900 ✓	7920 ✓
C	11880	3960 ✓	3168 ✓
D	6600	1650 ✓	1320 ✓
E	7920	3960 ✓	3168 ✓
F	11679	5840 ✓	4672 ✓

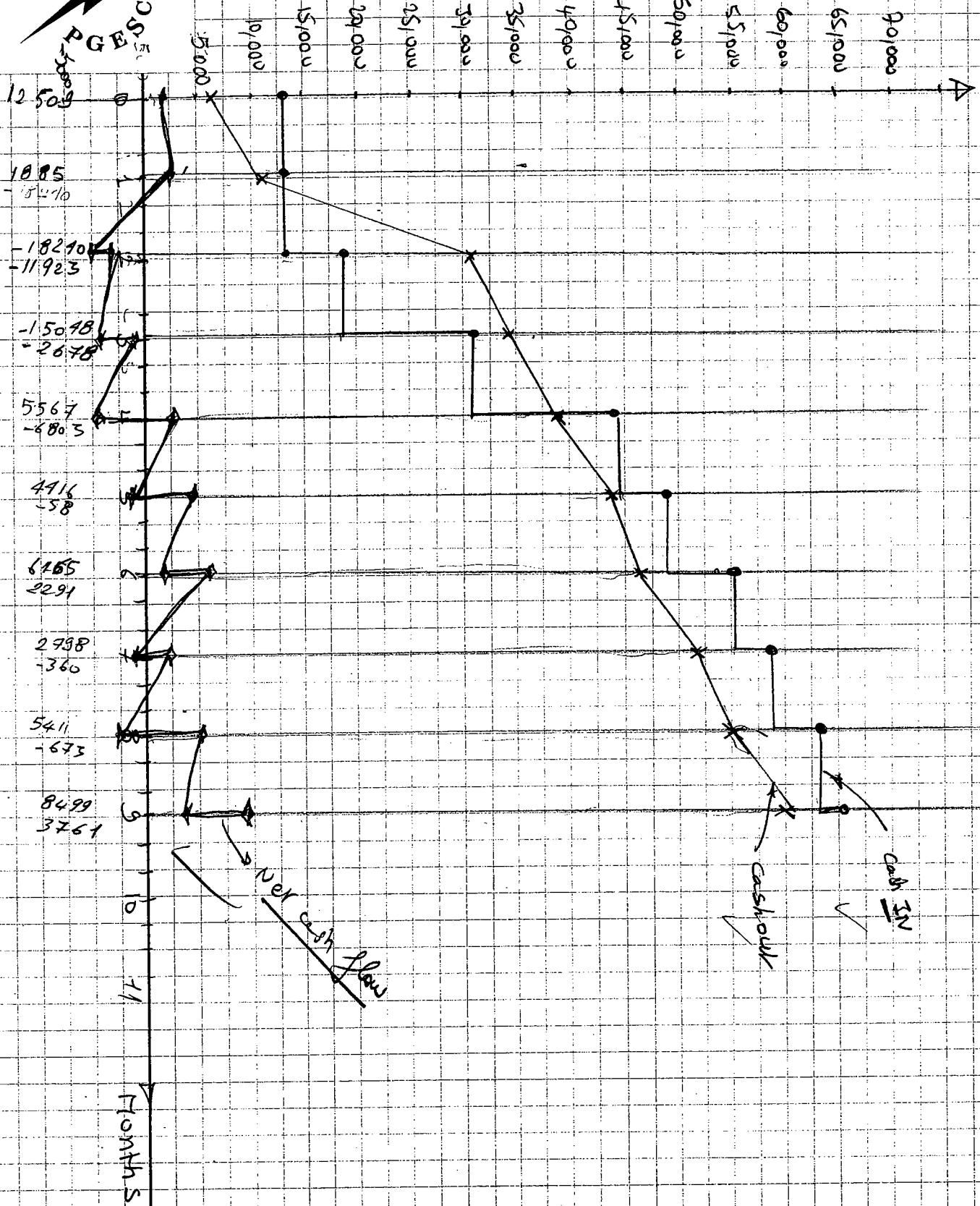
65,799



Cash out

	1	2	3	4	5	6	7	8	9	10	11	12
A	3000											
B	2000	500 ✓	500 ✓									
C	1000	1000 ✓	1000 ✓	1000								
D	1000	1000	1000	1000	1000							
E				500 ✓	500 ✓	500 ✓						
F				1500 ✓	1500 ✓	1500 ✓	1500 ✓	1500 ✓	1500 ✓	1500 ✓		
BOND	650	10,000	10,500	2500	3500	5000	1500	6500	1500			
Tax									1650 ✓			
P.C. cost	6050	6050	6050	6050	6050	6050	6050	6050	6050			
F.C	650	10,000	20,000	31,000	41,000	50,000	60,000	70,000	80,000	90,000	100,000	110,000
T.C	650	10,000	20,000	31,000	41,000	50,000	60,000	70,000	80,000	90,000	100,000	110,000
Cumulative	650	10,000	20,000	31,000	41,000	50,000	60,000	70,000	80,000	90,000	100,000	110,000





Question No. 1:

Construct the completed Bid form for the following bridge project. Table (1) shows the activity costs. Assuming the following:

- Project overhead 15%.
- Tax 3%.
- Bond 1%.
- Profit 15%

Table (1)

Activity	Unit	Quantity	Labor costs	Material costs	Equipment costs	Subcontractors cost
1	m <sup>3</sup>	1667	0	1322	619	0
2	m <sup>3</sup>	120	0	1501	390	0
3	m <sup>3</sup>	340	0	1607	323	0
4	m <sup>3</sup>	2240	7044	5044	3752	0
5	m <sup>3</sup>	120	4624	1553	295	0
6	m <sup>3</sup>	280	12099	13870	3154	0
7	m <sup>3</sup>	200	3504	5434	606	0
8	m <sup>3</sup>	90000	15750	10080	1800	0
9	m <sup>3</sup>	65500	20305	1834	880	0
10	m <sup>3</sup>	3200	1376	672	220	0
11	m <sup>3</sup>	120	2640	734	151	
12	L.S.	Job	0	0	0	4100

Question No. 2:

Draw the cash flow diagram for the given project below. Table (2) shows the activities dependency, duration, and cost elements. Assuming the following:

- The indirect cost will be 30000 L.E. each month.
- Project profit will be 25% from total cost.
- Neglect any other costs.
- Invoices are submitted every month and will be paid a month later.



Table (2)

Activity	Depends on	Duration (months)	Costs per months
A	----	1	50000
B	A	3	100000
C	A	1	200000
D	B,C	2	250000
E	D	1	100000

**Question No. 3:**

Draw the cash flow diagram for the given project below and calculate the net profit. Table (3) shows the activities dependency, duration, and cost elements. Assuming the following:

- Project overhead 15%.
- Tax 3%.
- Bond 1%.
- Profit 10%
- Down Payment 10%
- Invoices are submitted every month and will be paid a month later.
- Retention 5% and will be paid at the last invoice.
- Subcontractors: retention 5% and will be paid at the last invoice, down payment 20%.
- Labor expenses to be paid weekly.
- Material expenses to be paid: 50% upon delivery and 50% four weeks (one month after); assuming that the material will be delivered just when needed.
- Equipment expenses will be paid a month later.

Table (3)

Activity	Depends on	Duration (weeks)	Labor costs	Material costs	Equipment costs	Subcontractors cost
A	----	4	22000	45000	15000	----
B	A	4	42000	185000	55000	----

C	A	2	10000	15000	-----	-----
D	B, C	2			-----	50000
E	D	6	18000	78000	12000	-----

**Question No. 4:**

Draw the cash flow diagram for the given project below and calculate the net profit. Table (4) shows the activities dependency, duration, and cost elements. Assuming the following:

- Down Payment 20%
- Invoice are submitted every month and to be paid a month after
- Retention 10%
- Profit 20%
- Labor expenses to be paid weekly.
- Material expenses to be paid: 50% upon delivery and 50% four weeks (one month after); assuming that the material will be delivered just when needed.
- Equipment expenses will be paid a month after.

Table (4)

Activity No.	Predecessor	Duration (weeks)	Labor X/week	Labor Y/week	Material Cost	Equipment Cost
A	---	4	7	7	4000	---
B	A	8	7	7	16000	---
C	A	2	1	---	2000	---
D	B, C	1	1	---	2000	2000
E	B, C	1	1	1	2000	6000
F	D	3	1	1	12000	---
G	E	5	1	1	15000	---
H	F, G	2	1	1	2000	---

Labor X cost = 160 L.E./week

Labor Y cost = 120 L.E./week