Tutorial Letter 401/0/2024

Software Project Management
INF3708

Year Module(s)

DEPARTMENT OF INFORMATION SYSTEMS

IMPORTANT INFORMATION

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1. Introduction

Greetings, students! This is Tutorial Letter 401. In this tutorial letter, I discuss the solutions to Assessment 2 questions. Most of the questions were straightforward; however, in structuring some of the other questions, I intentionally left out certain information because I expect third year level students to fill in the blanks (make strong assumptions). Essentially, these types of questions are underpinned by Bloom's taxonomy (discussed in the next section).

Regrettably, I committed errors in creating the activity-on-node (AoN) diagram. Consequently, questions related to the AoN diagram meant that none of the options (i.e., a, b, c, or d) were valid. To compensate for my mistake, I configured the quiz to specify all the options as correct; this way, you will not be marked down. Additionally, I added a third opportunity to attempt the quiz. I discuss the details of the AoN erroneous questions in Tutorial Letter 301, Section "4. Errors in the Activity-on-Node Diagram." Also, see Tutorial Letter 201 for steps on creating an AoN diagram.

2. Bloom's taxonomy

For an assessment to meet quality standards and achieve certain learning outcomes, lecturers frame assessments using Bloom's taxonomy. In short, Bloom's taxonomy is used to evaluate knowledge acquisition at different cognitive levels. At the third-year level, we expect students to engage successfully and perform 'analysis.' At the analysis level, a student should exhibit the ability "to develop multiple conclusions concerning the motives, causes, inferences, and generalizations that can be derived from the material's component parts and organization" (University of Central Florida, n.d.). Consider the following question I presented:

The project team deployed a weighed scoring model as a systematic selection process to select the best project that support the desired deliverables. Study the different criteria and their assigned weights in the table below. Note the numerical scores for each Project that has been assigned to each criteria. Calculate the weighted score for Project 1.

Criteria	Weight	Project 1	Project 2	Project 3	Project 4
Supports key business objectives	28%	85	90	70	75
Has strong internal sponsor	14%	70	85	75	80
Has strong customer support	10%	80	85	65	60
Uses realistic level of technology	5%	95	95	95	95
Can be implemented in one year or less	15%	25	30	25	20
Provides positive NPV	18%	70	75	85	80
Has low risk in meeting scope, time, and cost goals	10%	30	40	65	35
Weighted project scores	100%		72,35		63,85

- a. 65.4
- b. 66
- c. 65
- d. 66.7

The formula to calculate the weighted score is as follows: The sum of each criterion's weighted score. Each criterion's weighted score is calculated by multiplying its weight with its score. For example, the weighted score of Project 1's '[p]rovides positive NPV' criterion is 18% * 70 = 12.6. Based on this formula, the total weighted score of Project 1 is 65.7. It can be inferred from the options that Option B, 66%, is the only mathematically viable answer derived from rounding off 65.7 to the nearest whole number. Many students opined that this is not a fair question – I disagree. To support this deliberate way of presenting the options, refer to (Schwalbe, 2019, p. 165) ROI calculation:

"ROI = (total discounted benefits – total discounted costs) / total discounted costs ROI = (516,000 – 243,200) / 243,200 = 112%."

If you are to calculate the above ROI, the answer will be 1.121711. Schwalbe does not make any mention of converting 1.121710526 to percentage format. Needless to state, 1.121710526 does not match 112% in display format if this were a quiz question. For a more detailed discussion about discrepant values, see the entries titled "Assignment 2: Rounding decimal numbers to the nearest whole number" and "Confusion of terminology, discrepant values and the forthcoming memo discussion" that I posted in the Announcements section of the INF3708 module site.

3. Solutions

In this section, I present the Assessment 2 questions and solutions.

1.	A project's net profit is calculated by:
a	adding total expenses to the initial investment
b	deducting total expenses from total income
c	deducting total cash inflows from total cash outflows
d	adding total cash inflows to the initial investment
Correct answer	b
Comment	To calculate net profit is basic: deduct total expenses from total income. So, if total expenses are R20,000.00 and total income is R40,000.00, the formula to calculate net profit is as follows: Net profit = total income – total expenses = R40,000.00 – R20,000.00 = R20,000.00. I recycled this question from a previous assessment. Something has gone during importing the question; at one stage, Option C was selected as the correct answer. Option C is however not valid. If I were to calculate the net profit by deploying the formula of Option C, the calculation would look as follows: Net profit = total cash outflows – total cash inflows = R20,000.00 – R40,000.00 = -R20,000.00. Needless to state, net profit cannot be a negative value.

2.	Project integration management involves the following phases: 1. developing the project charter. 2. developing the project management plan. 3. directing and managing project work. 4. 5. Monitoring and controlling. 6. performing integrated change control. 7. closing the project or phase. Which phase must be indicated at phase 4?

a	Monitoring and controlling project work
b	Managing product knowledge
c	Creating new knowledge
d	Managing project knowledge
Correct answer	d
Comment	This question and answer derives from page 152 of the textbook (Schwalbe, 2019).

3.	A project team must choose whether to launch Project A or Project B. The table below illustrates the respective amount that will be invested for each project, followed by the expected annual revenue. Calculate the net profit for Project A.

Year	Project A	Project B
0	-R250 000,00	-R300 000,00
1	R95 000,00	R150 000,00
2	R110 000,00	R210 000,00
3	R132 000,00	R120 000,00
4	R166 000,00	R140 000,00

a	R250 000,00
b	R253 050,00
c	R253 000,00
d	R253 010,00
Correct answer	c
Comment	Formula to calculate net profit: Net Profit = Total Income – Total Expenses = (R95 000,00 + R110 000,00 +

	R132 000,00 + R166 000,00) – R250 000 = R253 000,00

4.	Project integration management includes _____, which involves identifying and managing the points of interaction between various elements of a project. Its primary tools are communication and relationships.
a	integration management
b	interaction management
c	integrational management
d	interface management
Correct answer	d
Comment	Interface management is discussed on page 154 of the textbook. An example of interface management is Chapter 4's opening case about Nick Carson who confuses software integration management with project integration management.

5.	What term is used for the minimum acceptable rate of return on an investment?
a	Capitalisation rate
b	Required rate of return
c	Discount rate
d	Internal rate of return
Correct answer	b
Comment	Note that rate of return is used interchangeably with return on investment (ROI). The basic formula to calculate ROI is subtracting the project costs from the project income and then dividing by the cost. If an organisation set

	a project's required rate of return for a project at 110% and has invested R100,000.00, they must generate an income of R210,000.00 to meet the required rate of return.

6.	What does it mean when your organisation has a required rate of return?
a	It is the maximum acceptable rate of return on an investment
b	It is the minimum acceptable rate of return on an investment
c	It is the average acceptable rate of return on an investment
d	It is the average and maximum acceptable rate of return on an investment
Correct answer	b
Comment	This question and its correct answer are similar to that of Question 5.

7.	A project team must choose whether to launch Project A or Project B. The table below illustrates the respective amount that will be invested for each project, followed by the expected annual revenue. Calculate the net profit for Project B.		
	Year	Project A	Project B
	0	-R250 000,00	-R300 000,00
	1	R95 000,00	R150 000,00
	2	R110 000,00	R210 000,00
	3	R132 000,00	R120 000,00
	4	R166 000,00	R140 000,00
a	R320 000,00		
b	R310 000,00		
c	R300 000,00		

d	R320 010,00
Correct answer	a
Comment	Formula to calculate net profit: Net Profit = Total Income – Total Expenses = (R150 000,00 + R210 000,00 + R120 000,00 + R140 000,00) – R300 000 = R320 000,00

8.	Which technique takes into account both the profitability of a project as well as the timing of cash flow?
a	Critical Path Method (CPM)
b	Net Present Value (NPV)
c	Return on Investment (ROI)
d	Payback period
Correct answer	b
Comment	The net present value is a method of calculating the expected net monetary gain or loss from a project by calculating the value of all expected future cash inflows and outflows at the present time

9.	The project team deployed a weighted scoring model as a systematic selection process to select the best project that supports the desired deliverables. Study the different criteria and their assigned weights in the table below. Note the numerical scores for each project that has been assigned to each criterion. Calculate the weighted score for Project 3.

Criteria	Weight	Project 1	Project 2	Project 3	Project 4
Supports key business objectives	28%	85	90	70	75

Has strong internal sponsor	14%	70	85	75	80
Has strong customer support	10%	80	85	65	60
Uses realistic level of technology	5%	95	95	95	95
Can be implemented in one year or less	15%	25	30	25	20
Provides positive NPV	18%	70	75	85	80
Has low risk in meeting scope, time, and cost goals	10%	30	40	65	35
Weighted project scores	100%		72,35		63,85

a	66,4
b	67,9
c	66
d	67
Correct answer	d
Comment	The weighted score is calculated by weighting each criterion by the project activity score and adding the resulting values. In the case of Project 3: (28% * 70) + (14% * 75) + (10% * 65) + (5% * 95) + (15%) * 25) + (18% * 85) + (10% * 65) = 66,90% 66,9% rounded to the nearest whole number is 67%

10.	You launched Project X based on the pre-investor's model. Pre-investors denote non-professional or non-institutional investors such as friends, family

	and strangers who help to fund the project. However, they expect to see a return on their investment. Project X involves a new social media platform that seeks to generate revenue from user subscriptions. To launch the project, the pre-investors need to invest an accumulative amount of R75 000,00 (Year 0). As subscribers and pre-investors join your venture, you expect the initial investment of R75 000,00 to grow, increasing with R15 550,00 annually for four years (Years 1-4). In the first year, you expect the new social media platform to generate R110 000,00, increasing annually with R25 000,00. Calculate the total project expenses.
a	R90 550,00
b	R530 500,00
c	R137 200,00
d	R75 000,00
Correct answer	b
Comment	Examine the Excel formulas I applied in Figure 1 to calculate the annual cumulative investment and total expense. Figure 2 illustrates the result.

	A	B	C	D
1	Annual investment increase:			15550
2	Annual revenue increase:			25000
3				
4	Year	**Expenses**		
5	0	75000		
6	1	=B5+$D$1		
7	2	=B6+$D$1		
8	3	=B7+$D$1		
9	4	=B8+$D$1		
10				
11	**Total**	**=SUM(B5:B9)**		

Figure 1. Excel formulas applied to calculate the cumulative annual investment and the total expenses.

	A	B	C	D
1	Annual investment increase:			R15 550,00
2	Annual revenue increase:			R25 000,00
3				
4	Year	Expenses		
5	0	R75 000,00		
6	1	R90 550,00		
7	2	R106 100,00		
8	3	R121 650,00		
9	4	R137 200,00		
10				
11	Total	R530 500,00		

Figure 2. Cumulative annual investment and total expense.

11.	You launched Project X based on the pre-investor's model. Pre-investors denote non-professional or non-institutional investors such as friends, family and strangers who help to fund the project. However, they expect to see a return on their investment. Project X involves a new social media platform that seeks to generate revenue from user subscriptions. To launch the project, the pre-investors need to invest an accumulative amount of R75 000,00 (Year 0). As subscribers and pre-investors join your venture, you expect the initial investment of R75000 to grow, increasing with R15 550,00 annually for four years (Years 1-4). In the first year, you expect the new social media platform to generate R110 000,00, increasing annually with R25 000,00. Calculate the total project revenue.
a	R530 500,00
b	R590 000,00
c	R500 000,00
d	R185 000,00
Correct answer	b
Comment	Examine the Excel formulas that I applied in Figure 3 to calculate the annual and total revenue. Figure 4 illustrates the result.

	A	B	C
1		Annual investment increase:	15550
2		Annual revenue increase:	25000
3			
4	Year	**Expenses**	**Revenue**
5	0	75000	0
6	1	90550	110000
7	2	106100	=C6+$C$2
8	3	121650	=C7+$C$2
9	4	137200	=C8+$C$2
10	Total	*530500*	=SUM(C5:C9)

Figure 3. Excel formulas applied to calculate annual and total revenue.

	A	B	C
1		Annual investment increase:	R15 550,00
2		Annual revenue increase:	R25 000,00
3			
4	Year	**Expenses**	**Revenue**
5	0	R75 000,00	R0,00
6	1	R90 550,00	R110 000,00
7	2	R106 100,00	R135 000,00
8	3	R121 650,00	R160 000,00
9	4	R137 200,00	R185 000,00
10	Total	*R530 500,00*	*R590 000,00*

Figure 4. Annual and total revenue.

12.	You launched Project X based on the pre-investor's model. Pre-investors denote non-professional or non-institutional investors such as friends, family and strangers who help to fund the project. However, they expect to see a return on their investment. Project X involves a new social media platform that seeks to generate revenue from user subscriptions. To launch the project, the pre-investors need to invest an accumulative amount of R75 000,00 (Year 0). As subscribers and pre-investors join your venture, you expect the initial investment of R75000 to grow, increasing with R15 550,00 annually for four years (Years 1-4). In the first year, you expect the new social media platform to generate R110 000,00, increasing annually

	with R25 000,00. Calculate the net profit.
a	R59 500,00
b	R530 500,00
c	R59 000,00
d	R590 000,00
Correct answer	a
Comment	The basic formula to calculate net profit is as follows: Net Profit = Total Revenue – Total Expenses. Examine the Excel formulas I applied in Figure 5 to calculate the net profit. Figure 6 illustrates the result.

	A	B	C
1		Annual investment increase:	15550
2		Annual revenue increase:	25000
3			
4	Year	**Expenses**	**Revenue**
5	0	75000	0
6	1	90550	110000
7	2	106100	135000
8	3	121650	160000
9	4	137200	185000
10	**Total**	**530500**	**590000**
11			
12	**NET PROFIT**	**=C10-B10**	

Figure 5. Cell B12 in Excel displays the formula to calculate the net profit.

	A	B	C
1		Annual investment increase:	R15 550,00
2		Annual revenue increase:	R25 000,00
3			
4	Year	Expenses	Revenue
5	0	R75 000,00	R0,00
6	1	R90 550,00	R110 000,00
7	2	R106 100,00	R135 000,00
8	3	R121 650,00	R160 000,00
9	4	R137 200,00	R185 000,00
10	Total	R530 500,00	R590 000,00
11			
12	NET PROFIT	R59 500,00	

Figure 6. Cell B12 shows the net profit of R59 500,00.

13.	You launched Project X based on the pre-investor's model. Pre-investors denote non-professional or non-institutional investors such as friends, family and strangers who help to fund the project. However, they expect to see a return on their investment. Project X involves a new social media platform that seeks to generate revenue from user subscriptions. To launch the project, the pre-investors need to invest an accumulative amount of R75 000,00 (Year 0). As subscribers and pre-investors join your venture, you expect the initial investment of R75000 to grow, increasing with R15 550,00 annually for four years (Years 1-4). In the first year, you expect the new social media platform to generate R110 000,00, increasing annually with R25 000,00. Calculate the annual discount factor based on a discount rate of 8%.
a	1; 0.93; 0.86; 0.79; 0.75
b	1; 0.91; 0.83; 0.75; 0.68
c	1; 0.93; 0.86; 0.79; 0.74
d	1; 0.92; 0.87; 0.8; 0.74

Correct answer	c
Comment	Discount factor (and it formula) is discussed on page 165 of the textbook. Examine the Excel formulas I applied in Figure 7 to calculate the annual discount factor. Figure 8 illustrates the result.

	A	B
1	Discount rate	0,08
2		
3	YEAR	Discount factor
4	0	=1/(1+$D$205)^A4
5	1	=1/(1+$D$205)^A5
6	2	=1/(1+$D$205)^A6
7	3	=1/(1+$D$205)^A7
8	4	=1/(1+$D$205)^A8

Figure 7. The discount factor formula applied in Excel.

	A	B
1	Discount rate	8%
2		
3	YEAR	Discount factor
4	0	1,00
5	1	0,93
6	2	0,86
7	3	0,79
8	4	0,74

Figure 8. The annual discount factor.

14.	You launched Project X based on the pre-investor's model. Pre-investors denote non-professional or non-institutional investors such as friends, family and strangers who help to fund the project. However, they expect to see a return on their investment. Project X involves a new social media platform that seeks to generate revenue from user subscriptions. To launch the project, the pre-investors need to invest an accumulative amount of R75 000,00 (Year 0). As subscribers and pre-investors join your venture, you

	expect the initial investment of R75000 to grow, increasing with R15 550,00 annually for four years (Years 1-4). In the first year, you expect the new social media platform to generate R110 000,00, increasing annually with R25 000,00. Calculate the annual discount factor based on a discount rate of 10%.
a	1; 0.93; 0.86; 0.79; 0.75
b	1; 0.91; 0.86; 0.79; 0.66
c	1; 0.91; 0.83; 0.75; 0.68
d	1; 0.92; 0.87; 0.8; 0.74
Correct answer	c
Comment	Discount factor (and it formula) is discussed on page 165 of the textbook. Examine the Excel formulas I applied in Figure 9 to calculate the annual discount factor. Figure 10 illustrates the result. |	A	B
---	---	---
1	Discount rate	0,1
2		
3	YEAR	Discount factor
4	0	=1/(1+$B$1)^A4
5	1	=1/(1+$B$1)^A5
6	2	=1/(1+$B$1)^A6
7	3	=1/(1+$B$1)^A7
8	4	=1/(1+$B$1)^A8	 **Figure 9. The discount factor formula applied in Excel.**

	A	B
1	Discount rate	10%
2		
3	YEAR	Discount factor
4	0	1,00
5	1	0,91
6	2	0,83
7	3	0,75
8	4	0,68

Figure 10. The annual discount factor.

15.	You launched Project X based on the pre-investor's model. Pre-investors denote non-professional or non-institutional investors such as friends, family and strangers who help to fund the project. However, they expect to see a return on their investment. Project X involves a new social media platform that seeks to generate revenue from user subscriptions. To launch the project, the pre-investors need to invest an accumulative amount of R75 000,00 (Year 0). As subscribers and pre-investors join your venture, you expect the initial investment of R75000 to grow, increasing with R15 550,00 annually for four years (Years 1-4). In the first year, you expect the new social media platform to generate R110 000,00, increasing annually with R25 000,00. Calculate the annual discounted cost based on a discount rate of 10%.
a	R75 000,00; y1 = R82 318,18; y2 = R87 685,95; y3 = R91 397,45; y4 = 93 709,45
b	R75 000,00; y1 = R90 500,00; y2 = R106 100,00; y3 = R121 650,00; y4 = R137 200,00
c	R75 000,00; y1 = R90 550,00; y2 = R106 100,00; y3 = R121 650,00; y4 = R137 200,00
d	R75 000,00; y1 = R82 318,18; y2 = R87 685,95; y3 = R91 397,45; y4 = 90 709,45

Correct answer	a
Comment	Discounted costs (and their formula) is discussed on page 165 of the textbook. Examine the Excel formulas I applied in Figure 11 to calculate the annual discounted cost. Figure 12 illustrates the result.

	A	B	C
1		Annual investment	15550
2		Discount rate	0,1
3			
4		YEAR	Discount factor
5		0	=1/(1+$C$2)^B5
6		1	=1/(1+$C$2)^B6
7		2	=1/(1+$C$2)^B7
8		3	=1/(1+$C$2)^B8
9		4	=1/(1+$C$2)^B9
10			
11	Year	Expenses	Discounted cost
12	0	75000	=B12*C5
13	1	=B12+$C$1	=B13*C6
14	2	=B13+$C$1	=B14*C7
15	3	=B14+$C$1	=B15*C8
16	4	=B15+$C$1	=B16*C9

Figure 11. The sequence of formulas applied to calculate the annual discounted cost.

	A	B	C
1		Annual investment	R15 550,00
2		Discount rate	10%
3			
4		Year	Discount factor
5		0	1,0
6		1	0,9
7		2	0,8
8		3	0,8
9		4	0,7
10			
11	**Year**	**Expenses**	**Discounted cost**
12	0	R75 000,00	R75 000,00
13	1	R90 550,00	R82 318,18
14	2	R106 100,00	R87 685,95
15	3	R121 650,00	R91 397,45
16	4	R137 200,00	R93 709,45

Figure 12. Annual discounted cost in cells C12 to C16.

16.	You launched Project X based on the pre-investor's model. Pre-investors denote non-professional or non-institutional investors such as friends, family and strangers who help to fund the project. However, they expect to see a return on their investment. Project X involves a new social media platform that seeks to generate revenue from user subscriptions. To launch the project, the pre-investors need to invest an accumulative amount of R75 000,00 (Year 0). As subscribers and pre-investors join your venture, you expect the initial investment of R75000 to grow, increasing with R15 550,00 annually for four years (Years 1-4). In the first year, you expect the new social media platform to generate R110 000,00, increasing annually with R25 000,00. Calculate the total discounted expenses (assume a discount rate of 10%)
a	R560 000,00
b	R530 000,00

c	R430 111.02
d	R430 000.00
Correct answer	c
Comment	Discounted expenses/costs (and their formula) are discussed on page 165 of the textbook. Examine the Excel formulas I applied in Figure 13 to calculate the total discounted expenses. Figure 14 illustrates the result.

	A	B	C
1		Annual investment	15550
2		Discount rate	0,1
3			
4		YEAR	Discount factor
5		0	=1/(1+$C$2)^B5
6		1	=1/(1+$C$2)^B6
7		2	=1/(1+$C$2)^B7
8		3	=1/(1+$C$2)^B8
9		4	=1/(1+$C$2)^B9
10			
11	**Year**	**Expenses**	**Discounted expenses**
12	0	75000	=B12*C5
13	1	=B12+$C$1	=B13*C6
14	2	=B13+$C$1	=B14*C7
15	3	=B14+$C$1	=B15*C8
16	4	=B15+$C$1	=B16*C9
17		**Total discounted expenses**	**=SUM(C12:C16)**

Figure 13. The sequence of formulas that lead to calculating the total discounted cost in cell C17.

	A	B	C
1		Annual investment	R15 550,00
2		Discount rate	10%
3			
4		YEAR	Discount factor
5		0	1,0
6		1	0,9
7		2	0,8
8		3	0,8
9		4	0,7
10			
11	Year	Expenses	Discounted expenses
12	0	R75 000,00	R75 000,00
13	1	R90 550,00	R82 318,18
14	2	R106 100,00	R87 685,95
15	3	R121 650,00	R91 397,45
16	4	R137 200,00	R93 709,45
17		Total discounted expenses	R430 111,02

Figure 14. The total discounted expenses display in cell C17.

17.	You launched Project X based on the pre-investor's model. Pre-investors denote non-professional or non-institutional investors such as friends, family and strangers who help to fund the project. However, they expect to see a return on their investment. Project X involves a new social media platform that seeks to generate revenue from user subscriptions. To launch the project, the pre-investors need to invest an accumulative amount of R75 000,00 (Year 0). As subscribers and pre-investors join your venture, you expect the initial investment of R75 000,00 to grow, increasing with R15 550,00 annually for four years (Years 1-4). In the first year, you expect the new social media platform to generate R110 000,00, increasing annually with R25 000,00. Calculate the annual discounted project revenue (assume

	a discount rate of 10%)
a	Y0 = R0,00; Y1 = R110 000,00; Y2 = 135 000,00; Y3 = R160 000,00; Y4 = R184 000,00
b	Y0 = R110 000,00; Y1 = 137 000,00; Y2 = R160 000,00; Y3 = R185 000,00; Y4 = R210 000,00
c	Y0 = R0,00; Y1 = R100 000,00; Y2 = R111 570,25; Y3 = R120 210,37; Y4 = R126 357,49
d	R110 000,00; Y1 = 137 000,00; Y2 = R160 500,00; Y3 = R185 000,00; Y4 = R210 000,00
Correct answer	c
Comment	For a discussion about discounted benefits (and its formula), see page 165 of the textbook. Examine the Excel formulas that I applied in Figure 15 to calculate the annual discounted revenue. Figure 16 illustrates the result.

	A	B	C	D	E
1	Annual Investment increase			15550	
2	Annual Revenue increase			25000	
3	Discount rate			0,1	
4					
5		YEAR	Discount factor		
6		0	=1/(1+$D$3)^B6		
7		1	=1/(1+$D$3)^B7		
8		2	=1/(1+$D$3)^B8		
9		3	=1/(1+$D$3)^B9		
10		4	=1/(1+$D$3)^B10		
11					
12					
13	Year	Expenses	Discounted expenses	Revenue	Discounted Revenue
14	0	75000	=B14*C6	0	=D14*C6
15	1	=B14+$D$1	=B15*C7	110000	=D15*C7
16	2	=B15+$D$1	=B16*C8	=D15+$D$2	=D16*C8
17	3	=B16+$D$1	=B17*C9	=D16+$D$2	=D17*C9
18	4	=B17+$D$1	=B18*C10	=D17+$D$2	=D18*C10

Figure 15. The sequence of Excel formulas that lead to calculating the discounted annual revenue in cells E14 to E18.

	A	B	C	D	E
1	Annual Investment increase			R15 550,00	
2	Annual Revenue increase			R25 000,00	
3	Discount rate			10%	
4					
5		YEAR	Discount factor		
6		0	1,0		
7		1	0,9		
8		2	0,8		
9		3	0,8		
10		4	0,7		
11					
12					
13		Year	Expenses	Discounted expenses	Revenue	Discounted Revenue
14	0	R75 000,00	R75 000,00	R0,00	R0,00
15	1	R90 550,00	R82 318,18	R110 000,00	R100 000,00
16	2	R106 100,00	R87 685,95	R135 000,00	R111 570,25
17	3	R121 650,00	R91 397,45	R160 000,00	R120 210,37
18	4	R137 200,00	R93 709,45	R185 000,00	R126 357,49

Figure 16. Annual discounted revenue is displaying in cells E14 to E18.

18.	You launched Project X based on the pre-investor's model. Pre-investors denote non-professional or non-institutional investors such as friends, family and strangers who help to fund the project. However, they expect to see a return on their investment. Project X involves a new social media platform that seeks to generate revenue from user subscriptions. To launch the project, the pre-investors need to invest an accumulative amount of R75 000,00 (Year 0). As subscribers and pre-investors join your venture, you expect the initial investment of R75000 to grow, increasing with R15 550,00 annually for four years (Years 1-4). In the first year, you expect the new social media platform to generate R110 000,00, increasing annually with R25 000,00. Calculate the total discounted project revenue (assume a discount rate of 10%)

a	R458 138,11
b	R430 000,00
c	R400 000,00
d	R500 000,00
Correct answer	a
Comment	For a discussion about discounted benefits (and its formula), see page 165 of the textbook. Examine the Excel formulas I applied in Figure 17 to calculate the total discounted revenue. Figure 18 illustrates the result. (see table below) **Figure 17. The sequence of formulas in Excel that leads to calculating the total discounted revenue in cell E19.**

	A	B	C	D	E
1	Annual investment increase	25000			
2	Discount rate	0,1			
3					
4		YEAR	Discount factor		
5		0	=1/(1+$C$2)^B5		
6		1	=1/(1+$C$2)^B6		
7		2	=1/(1+$C$2)^B7		
8		3	=1/(1+$C$2)^B8		
9		4	=1/(1+$C$2)^B9		
10					
11					
12	Year	Expenses	Discounted expenses	Revenue	Discounted Revenue
13	0	75000	=B13*C5	0	=D13*C5
14	1	=B13+$C$138	=B14*C6	110000	=D14*C6
15	2	=B14+$C$138	=B15*C7	=D14+$C$1	=D15*C7
16	3	=B15+$C$138	=B16*C8	=D15+$C$1	=D16*C8
17	4	=B16+$C$138	=B17*C9	=D16+$C$1	=D17*C9
18				Total discounted revenue	=SUM(E13:E17)

	A	B	C	D	E
1	Annual investment increase		R25 000,00		
2	Discount rate		10%		
3					
4		YEAR	Discount factor		
5		0	1,0		
6		1	0,9		
7		2	0,8		
8		3	0,8		
9		4	0,7		
10					
11					
12	Year	Expenses	Discounted expenses	Revenue	Discounted Revenue
13	0	R75 000,00	R75 000,00	R0,00	R0,00
14	1	R75 000,00	R68 181,82	R110 000,00	R100 000,00
15	2	R75 000,00	R61 983,47	R135 000,00	R111 570,25
16	3	R75 000,00	R56 348,61	R160 000,00	R120 210,37
17	4	R75 000,00	R51 226,01	R185 000,00	R126 357,49
18				Total discounted revenue	R458 138,11

Figure 18. Total discounted revenue displays in cell E19.

19.	You launched Project X based on the pre-investor's model. Pre-investors denote non-professional or non-institutional investors such as friends, family and strangers who help to fund the project. However, they expect to see a return on their investment. Project X involves a new social media platform that seeks to generate revenue from user subscriptions. To launch the project, the pre-investors need to invest an accumulative amount of R75 000,00 (Year 0). As subscribers and pre-investors join your venture, you expect the initial investment of R75000 to grow, increasing with R15 550,00 annually for four years (Years 1-4). In the first year, you expect the new social media platform to generate R110 000,00, increasing annually with R25 000,00. Calculate the net present value (assume a discount rate of 10%)
a	R590 500,00
b	R470 800,00

c	R28 027.08
d	R47 800,50
Correct answer	c
Comment	NVP (and its formula) is discussed on page 165 of the textbook. Examine the Excel formulas I applied in Figure 19 to calculate the NVP. Figure 20 illustrates the result.

	A	B	C	D	E
1	Annual Investment increase			15550	
2	Annual Revenue increase			25000	
3	Discount rate			0,1	
4					
5		Year	Discount factor		
6		0	=1/(1+$D$3)^B6		
7		1	=1/(1+$D$3)^B7		
8		2	=1/(1+$D$3)^B8		
9		3	=1/(1+$D$3)^B9		
10		4	=1/(1+$D$3)^B10		
11					
12					
13	Year	Expenses	Discounted expenses	Revenue	Discounted Revenue
14	0	75000	=B14*C6	0	=D14*C6
15	1	=B14+$D$1	=B15*C7	110000	=D15*C7
16	2	=B15+$D$1	=B16*C8	=D15+$D$2	=D16*C8
17	3	=B16+$D$1	=B17*C9	=D16+$D$2	=D17*C9
18	4	=B17+$D$1	=B18*C10	=D17+$D$2	=D18*C10
19		Total expenses	=SUM(C14:C18)	Total discounted revenue	=SUM(E14:E18)
20					
21			NVP	=E19-C19	

Figure 19. The sequence of Excel formulas that leads to calculating the net present value that displays in cell D21.

	A	B	C	D	E
1	Annual Investment increase			R15 550,00	
2	Annual Revenue increase			R25 000,00	
3	Discount rate			R0,10	
4					
5		Year	Discount factor		
6		R0,00	R1,00		
7		R1,00	R0,91		
8		R2,00	R0,83		
9		R3,00	R0,75		
10		R4,00	R0,68		
11					
12					
13	Year	Expenses	Discounted expenses	Revenue	Discounted Revenue
14	0	R75 000,00	R75 000,00	R0,00	R0,00
15	1	R90 550,00	R82 318,18	R110 000,00	R100 000,00
16	2	R106 100,00	R87 685,95	R135 000,00	R111 570,25
17	3	R121 650,00	R91 397,45	R160 000,00	R120 210,37
18	4	R137 200,00	R93 709,45	R185 000,00	R126 357,49
19		Total expenses	R430 111,02	Total discounted revenue	R458 138,11
20					
21			NVP	R28 027,08	

Figure 20. The net present value is shown in cell D21.

20.	You launched Project X based on the pre-investor's model. Pre-investors denote non-professional or non-institutional investors such as friends, family and strangers who help to fund the project. However, they expect to see a return on their investment. Project X involves a new social media platform that seeks to generate revenue from user subscriptions. To launch the project, the pre-investors need to invest an accumulative amount of R75 000,00 (Year 0). As subscribers and pre-investors join your venture, you expect the initial investment of R75000 to grow, increasing with R15 550,00 annually for four years (Years 1-4). In the first year, you expect the new social media platform to generate R110 000,00, increasing annually with R25 000,00. Apply the formula for calculating the return on investment for multi-year projects (assume a discount rate of 10%).
a	7%
b	3%

c	5.5%
d	11%
Correct answer	a
Comment	ROI for multi-year projects is discussed on page 165 of the textbook. Examine the Excel formulas that I applied in Figure 21 to calculate the ROI for multi-year projects. Figure 22 illustrates the result.

	A	B
1	**Total expenses**	**430111,02**
3		
4	**Total discounted revenue**	**458138,11**
5		
6	**Return on investment (ROI)= (total discounted revenue - total discounted expenses)/discounted expenses**	
7		
8		**=(B4-B1)/B1**

Figure 21. The return-on-investment for multi-year projects applied in Excel.

	A	B	C	D
1	**Total expenses**	**R430 111,02**		
3				
4	**Total discounted revenue**	**R458 138,11**		
5				
6	**Return on investment (ROI)= (total discounted revenue - total discounted expenses)/discounted expenses**			
7				
8		**6,52%**		

Figure 22. The return-on-investment displays in cell B8 (not yet rounded to a whole number)

21.	You must choose between embarking on Project Y or Project Z. Return of investment (ROI) is one of the factors you are taking into account to inform your decision. Calculate the ROI of project Y.

Year	Project Y	Project Z

0	-R200 000,00	-R275 000,00
1	R85 000,00	R70 000,00
2	R70 000,00	R75 000,00
3	R78 000,00	R80 000,00
4	R33 000,00	R85 000,00
a	8%	
b	3%	
c	3,18%	
d	8,25%	
Correct answer	d	
Comment	To reach the correct ROI, you must specifically deploy the annualised ROI formula. In Tutorial Letter 3.1, Section "3. Return on Investment", I discuss Basic ROI and annualised ROI. Examine the Excel formulas that I applied in Figure 23 to calculate the ROI. Figure 24 illustrates the result. **Figure 23. Excel formulas applied to calculate ROI.**	

	A	B	C
1	Year	Project Y	
2	0	200000	
3	1	85000	
4	2	70000	
5	3	78000	
6	4	33000	
7			
8	Total profit:	66000	
9	Average annual profit = total profit/years:	16500	
10	ROI = (average annual profit x 100)/total investment:	8,25	%

Figure 24. The ROI is displayed in cell B10.

22.	You must choose between embarking on Project Y or Project Z. Return of investment (ROI) is one of the factors you are taking into account to inform your decision. Calculate the ROI of Project Z.

Year	Project Y	Project Z
0	-R200 000,00	-R275 000,00
1	R85 000,00	R70 000,00
2	R70 000,00	R75 000,00
3	R78 000,00	R80 000,00
4	R33 000,00	R85 000,00
a	3.18%	
b	8%	
c	3%	
d	8.25%	
Correct answer	a	

	Examine the Excel formulas I applied in Figure 25 to calculate the ROI. Figure 26 illustrates the result. Figure 26 illustrates the result.
Comment	

	A	B	C
1	Year	Project Z	
2	0	275000	
3	1	70000	
4	2	75000	
5	3	80000	
6	4	85000	
7			
8	Total profit:	=(B3+B4+B5+B6)-B2	
9	Average annual profit = total profit/years:	=B8/A6	
10	ROI = (average annual profit x 100)/total investment:	=(B9*100)/B2	%

Figure 25. Excel formulas applied to calculate ROI.

	A	B	C
1	Year	Project Z	
2	0	R275 000,00	
3	1	R70 000,00	
4	2	R75 000,00	
5	3	R80 000,00	
6	4	R85 000,00	
7			
8	Total profit:	R35 000,00	
9	Average annual profit = total profit/years:	R8 750,00	
10	ROI = (average annual profit x 100)/total investment:	3,18	%

Figure 26. The ROI is displayed in cell B10.

23.	Study the cash flow of Project Y and Project Z in the table below. What is the total discounted cash inflow of Project Y and Project Z? (Assume a discount rate of 8%).
a	R275 000,00 and R200 000,00
b	R200 000,00 and R275 000,00
c	R24 892,62 and -R19 900,66
d	R224 892,32 and R255 099,34

Correct answer	d
Comment	Examine the Excel formulas I applied in Figure 27 to calculate the total discounted cash *in*flow (TDCIF). Figure 28 illustrates the result.

	A	B	C	D
1		Discount rate	0.08	
2				
3		Discount rate factor		
4	Year 0	1		
5	Year 1	0.93		
6	Year 2	0.86		
7	Year 3	0.79		
8	Year 4	0.74		
9				
10	Project Y	Years	Cash flow	Annual discounted cash flow
11		0	200000	
12		1	85000	=C12*B5
13		2	70000	=C13*B6
14		3	78000	=C14*B7
15		4	33000	=C15*B8
16			Total DCIF	=SUM(D12:D15)
17				
18	Project Z	Years		
19		0	275000	
20		1	70000	=C20*B5
21		2	75000	=C21*B6
22		3	80000	=C22*B7
23		4	85000	=C23*B8
24			Total DCIF	=SUM(D20:D23)

Figure 27. Excel formulas applied to calculate the total discounted cash inflow.

	A	B	C	D
1		Discount rate	8%	
2				
3		Discount rate factor		
4	Year	1		
5	Year	0.93		
6	Year	0.86		
7	Year	0.79		
8	Year	0.74		
9				
10		Years	Cash flow	Annual discounted cash flow
11			0	R200 000.00	
12			1	R85 000.00	R79 050.00
13			2	R70 000.00	R60 200.00
14	Project Y		3	R78 000.00	R61 620.00
15			4	R33 000.00	R24 420.00
16			Total DCIF	R225 290.00
17				
18		Years		
19			0	R275 000.00	
20			1	R70 000.00	R65 100.00
21	Project Z		2	R75 000.00	R64 500.00
22			3	R80 000.00	R63 200.00
23			4	R85 000.00	R62 900.00
24			Total DCIF	R255 700.00

Figure 28. The total DCF of Project Y is displayed in cell D16 and the total DCF of Project Z is displayed in cell D26.

NB! The original version of this question, as displayed in Assessment 2 on the module site, contains a typo (see Figure 29):

34

Study the cash flow of Project Y and Project Z in the table below. What is the total discounted cash flow of Project Y and Project Z? (Assume a discount rate

Year	Project Y	Project Z
0	-R200 000,00	-R275 000,00
1	R85 000,00	R70 000,00
2	R70 000,00	R75 000,00
3	R78 000,00	R80 000,00
4	R33 000,00	R85 000,00

○ a. R224 892,32 and R255 099,34

○ b. R24 892,62 and -R19 900,66

○ c. R200 000,00 and R275 000,00

○ d. R275 000,00 and R200 000,00

Figure 29. The text "total discounted cash flow" is supposed to be "total discounted cash inflow".

I discuss this typo in the entry titled "Confusion of terminology, discrepant values and the forthcoming memo discussion" posted in the Announcements section of the INF3708 module site.

24.	Study the cash flow of Project Y and Project Z in the table below. What is the NVP of Project Y and Project Z? (Assume a discount rate of 8%).
a	R24 892,62 and R19 900,66
b	R200 000,00 and R275 000,00
c	R275 000,00 and R200 000,00
d	R24 892,32 and -R19 900,66
Correct answer	d
Comment	Examine the Excel formulas that I applied in Figure 30 to calculate NVP. Figure 31 illustrates the result.

	A	B	C	D
1		Discount Rate	0,08	
2				
3		Discount Rate Factor		
4		=1/(1+$C$1)^B11		
5		=1/(1+$C$1)^B12		
6		=1/(1+$C$1)^B13		
7		=1/(1+$C$1)^B14		
8		=1/(1+$C$1)^B15		
9				
10		Years	Cash flow	Annual discounted cash flow (DCF)
11		0	200000	
12	PROJECT Y	1	85000	=C12*B5
13		2	70000	=C13*B6
14		3	78000	=C14*B7
15		4	33000	=C15*B8
16			Total DCF	=SUM(D12:D15)
17			NPV	=D16-C11
18				
19				
20		Years	Cash flow	Annual DCF
21		0	275000	
22	PROJECT Z	1	70000	=C22*B5
23		2	75000	=C23*B6
24		3	80000	=C24*B7
25		4	85000	=C25*B8
26			Total DCF	=SUM(D21:D25)
27			NPV	=D26-C21

Figure 30. Excel formulas applied to calculate the NVP.

	A	B	C	D
1		Discount R	8%	
2				
3		Discount Rate Factor		
4		1,00		
5		0,93		
6		0,86		
7		0,79		
8		0,74		
9				
10		Years	Cash flow	Annual discounted cash flow (DCF)
11	PROJECT Y	0	R200 000,00	
12		1	R85 000,00	R78 703,70
13		2	R70 000,00	R60 013,72
14		3	R78 000,00	R61 918,91
15		4	R33 000,00	R24 255,99
16			Total DCF	R224 892,32
17			NPV	R24 892,32
18				
19				
20		Years	Cash flow	Annual DCF
21	PROJECT Z	0	R275 000,00	
22		1	R70 000,00	R64 814,81
23		2	R75 000,00	R64 300,41
24		3	R80 000,00	R63 506,58
25		4	R85 000,00	R62 477,54
26			Total DCF	R255 099,34
27			NPV	-R19 900,66

Figure 31. The NPV of Project Y is displayed in cell D17 and the NPV of Project Z is displayed in cell D27.

25.	What is payback period?
a	The amount of time it would take for a project manager to pay project members for overtime worked
b	The amount of time it would take for an investor to acquire project funds.

c	The amount of time it would take for an investor to show a profit
d	The amount of time it would take for a project to recover its initial cost.
Correct answer:	d
Comment:	For more on payback period analysis, please read Section "2.2 Payback Analysis for Consistent and Varying Cash Flows" in Tutorial Letter 301. Also, read the entry "The subtraction (-) symbol in payback period calculations" posted in the Announcements section of the INF3708 module site.

26.	When does payback usually occur?
a	When the net cumulative benefits equal the net cumulative costs
b	When the net cumulative benefits minus cost equal one
c	When the cumulative benefits are double the cumulative costs
d	When the net costs are lower than the cumulative benefits
Correct answer:	a

27.	Study the cash flow of Project Y in the table below. Calculate the payback period.

Year	Project Y	Project Z
0	-R200 000,00	-R275 000,00
1	R85 000,00	R70 000,00
2	R70 000,00	R75 000,00
3	R78 000,00	R80 000,00
4	R33 000,00	R85 000,00
a	1.4 years	

b	2.6 years
c	3.5 years
d	2 years
Correct answer	b

28.	Study the cash flow of Project Z in the table below. Calculate the payback period for Project Z.	
Year	Project Y	Project Z
0	-R200 000,00	-R275 000,00
1	R85 000,00	R70 000,00
2	R70 000,00	R75 000,00
3	R78 000,00	R80 000,00
4	R33 000,00	R85 000,00
a	3.6 years	
b	1.4 years	
c	3 years	
d	3.5 years	
Correct answer	a	

29.	An activity or _____ is an element of work normally found in the work breakdown structure (WBS) that has expected duration, cost, and resource requirements. Fill in the missing word.
a	milestone

b	product
c	task
d	deliverable
Correct answer	c
Comment	The action of creating something like a schedule management plan is called a *task*; similarly, the action of coding the physical software system is also a case of the software developer engaging in a task or *activity*.

30.	A _____on a project is a significant event that normally has no duration.
a	task
b	deliverable
c	milestone
d	product
Correct answer	c
Comment	Read the opening case of Chapter 6 in the textbook.

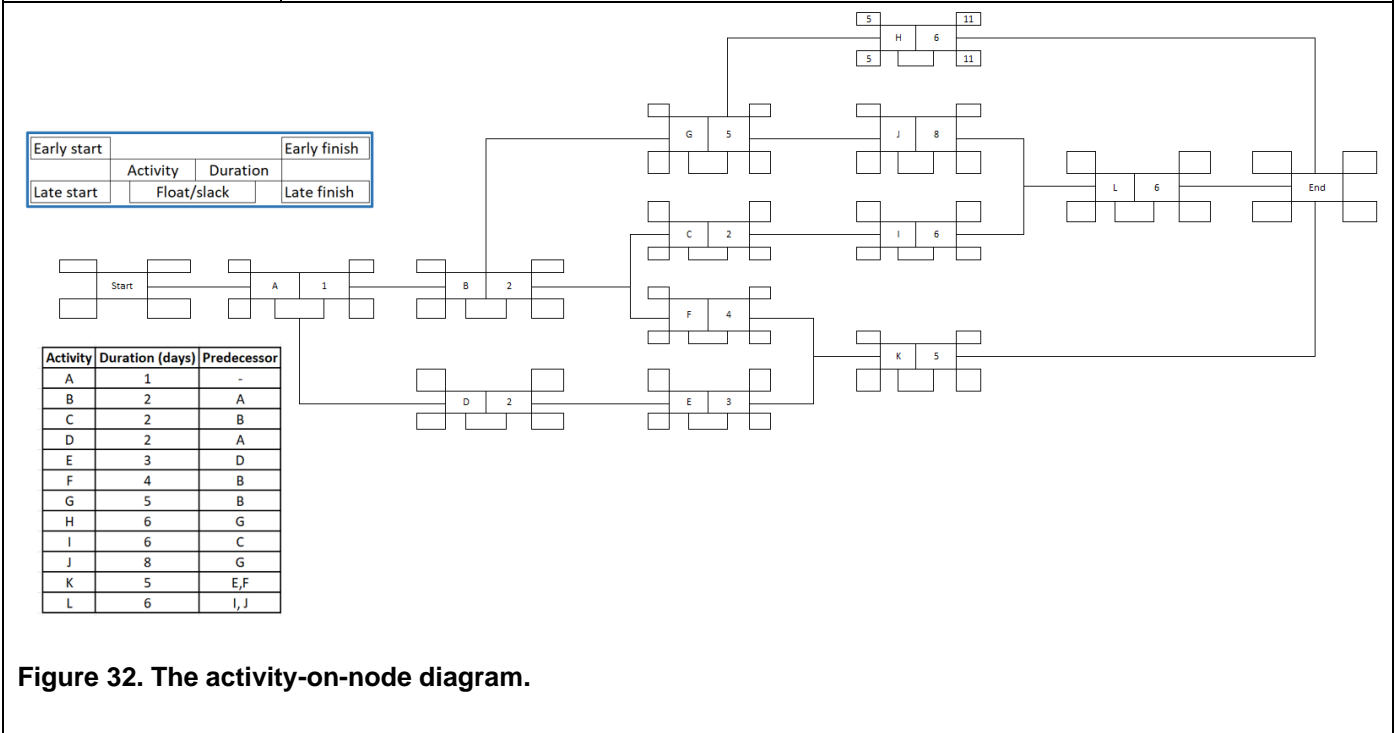| 31.	What is slack time in project scheduling?
a	The total time in which you can complete a task without delaying the project
b	The total time that you can delay a task to delay the project
c	The total time in which you can delay a project without delaying a task
d	The total time in which you can delay a task without delaying the project
Correct answer	d
Comment	I discuss slack time (in the broader context of project scheduling) in Tutorial

	Letter 201.

32.	_____ are also referred to as hard logic. For example, you cannot test code until after the code is written. Fill in the missing word.
a	Internal
b	External
c	Discretionary
d	Mandatory
Correct answer	d
Comment	"[Y]ou cannot test code until after the code is written" is a good example of mandatory dependency. Ask ChatGPT to produce a list of examples of mandatory dependencies in software project management.

33.	_____ involves relationships between project activities that are generally inside the project team's control. For example, if software is developed by the team, they can create dependencies such as performance unit testing before system testing. Fill in the missing word.
a	Discretionary
b	External
c	Mandatory
d	Internal
Correct answer	d
Comment	Towards an example of mandatory dependency, one can argue that code cannot be tested until after it has been written. While a team waits for the code to be tested, they may have some degree of influence over who the testers will be. Therefore, they can require applicants to submit their CV and

<table>
<tr><td></td><td>to avail themselves for an interview. In short, they create a dependency between testers and quality assurance; this constitutes an internal dependency.</td></tr>
</table>

<table>
<tr><td>34.</td><td>Study the activity list and its network diagram. Calculate the slack of Activity E.</td></tr>
</table>

Figure 32. The activity-on-node diagram.

a	1
b	0
c	6
d	2
Correct answer	None of the listed options is correct. This observation is linked to a student's note that Activity H displays an incorrect early start (ES) of 5, an incorrect early finish (EF) of 11, an incorrect late start (LS) of 5, and an incorrect late finish (LF) of 11 (see Figure 32 above). Consequently, the student argues that none of the provided options (a, b, c, or d) for the questions based on the incorrect AoN diagram is valid. The student then presented an annotated AoN diagram illustrating each activity's correct ES, EF, LS, LF, and slack, which, in turn, allowed him to identify the critical path. I recreated

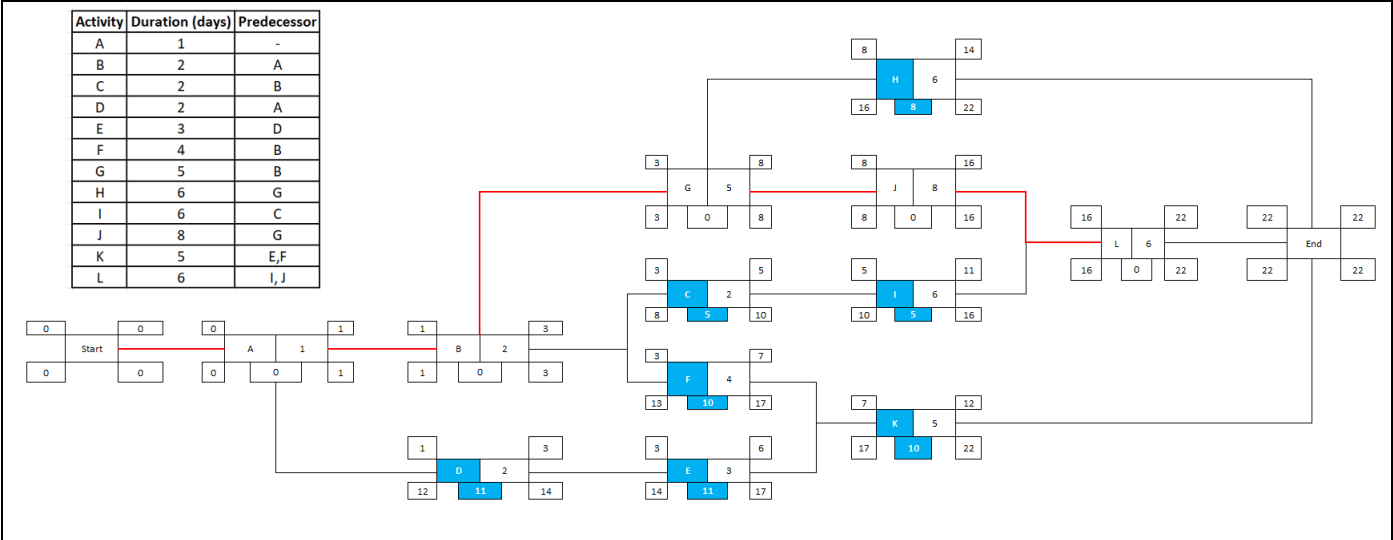the student's annotated AoN diagram in Figure 33 illustrated below.

Activity	Duration (days)	Predecessor
A	1	-
B	2	A
C	2	B
D	2	A
E	3	D
F	4	B
G	5	B
H	6	G
I	6	C
J	8	G
K	5	E,F
L	6	I, J

Figure 33. The correct AoN diagram.

Comment	Please read Tutorial 301, Section "4. Errors in the Activity-on-Node Diagram." In TL301, I explain the errors I committed when I designed the diagram. To compensate, I configured all the questions related to this activity-on-node diagram to grade all four options as correct. This way, you were not marked down. Also, read Tutorial 201, in which I explain how to create an AoN diagram.

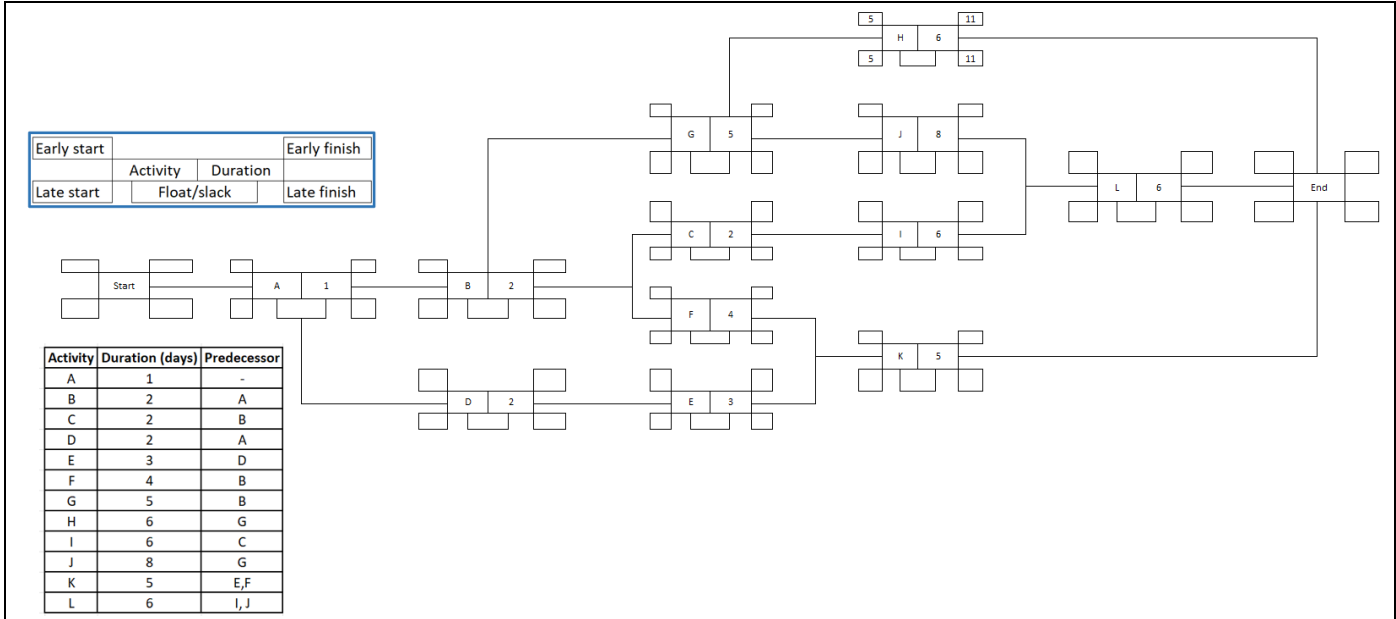| 35.	Study the activity list and its network diagram. Calculate the early start, early finish, late start and late finish of Activity K.

Figure 34. The activity-on-node diagram.

Activity	Duration (days)	Predecessor
A	1	-
B	2	A
C	2	B
D	2	A
E	3	D
F	4	B
G	5	B
H	6	G
I	6	C
J	8	G
K	5	E,F
L	6	I, J

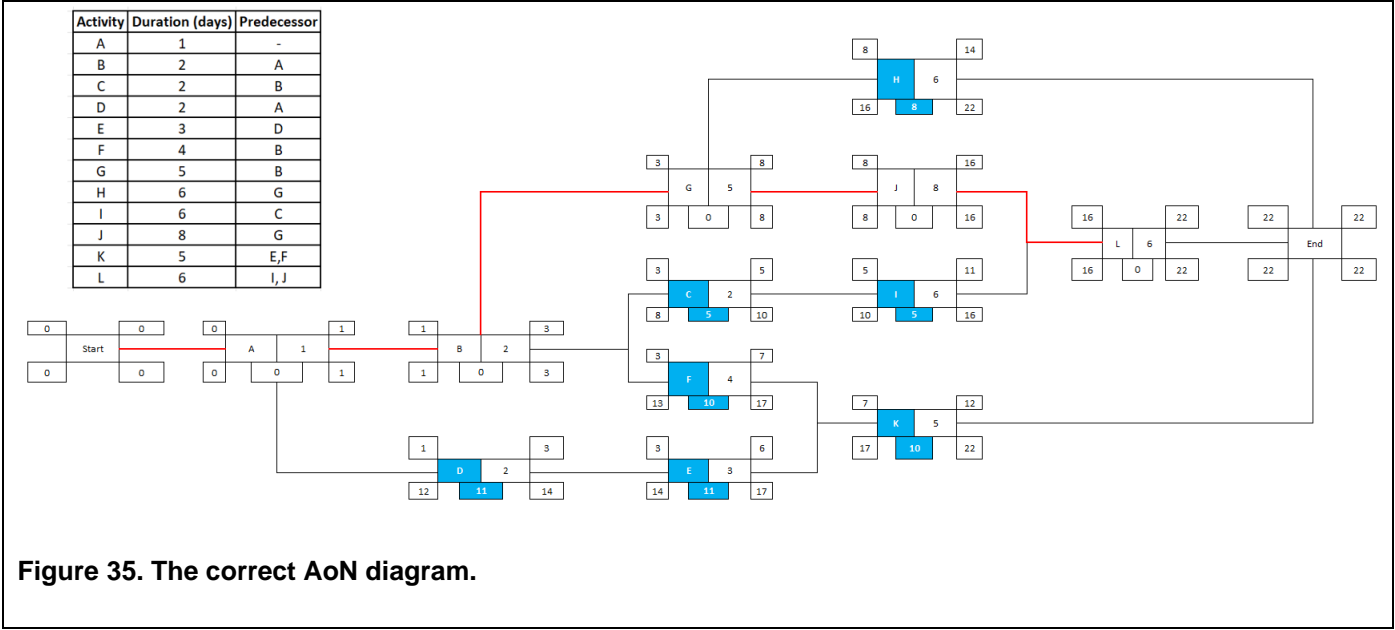| a	ES = 12, EF = 7, LS = 12, LF = 7
b	ES = 6, EF = 12, LS = 15, LF = 22
c	ES = 7, EF = 12, LS = 7, LF = 22
d	ES = 7, EF = 12, LS = 7, LF = 12
Correct answer	None of the listed options is correct. The correct answer should be ES = 7, EF = 12, LS = 17, LF = 22. Observe the correct ES, EF, LS and LF of Activity K in Figure 35 below.

Figure 35. The correct AoN diagram.

| 36. | Study the activity list and its network diagram. Calculate the early start, early finish, late start and late finish of Activity A. |

Figure 36. The activity-on-node diagram.

a	ES = 0, EF = 0, LS = 1, LF = 1
b	ES = 0, EF = 1, LS = 0, LF = 1
c	ES = 0, EF = 1, LS = 1, LF = 0

d	ES = 0, EF = 1, LS = 1, LF = 1
Correct answer	The correct answer is ES = 0, EF = 1, LS = 0, LF = 1. Observe the correct ES, EF, LS and LF of Activity A in Figure 37 below.
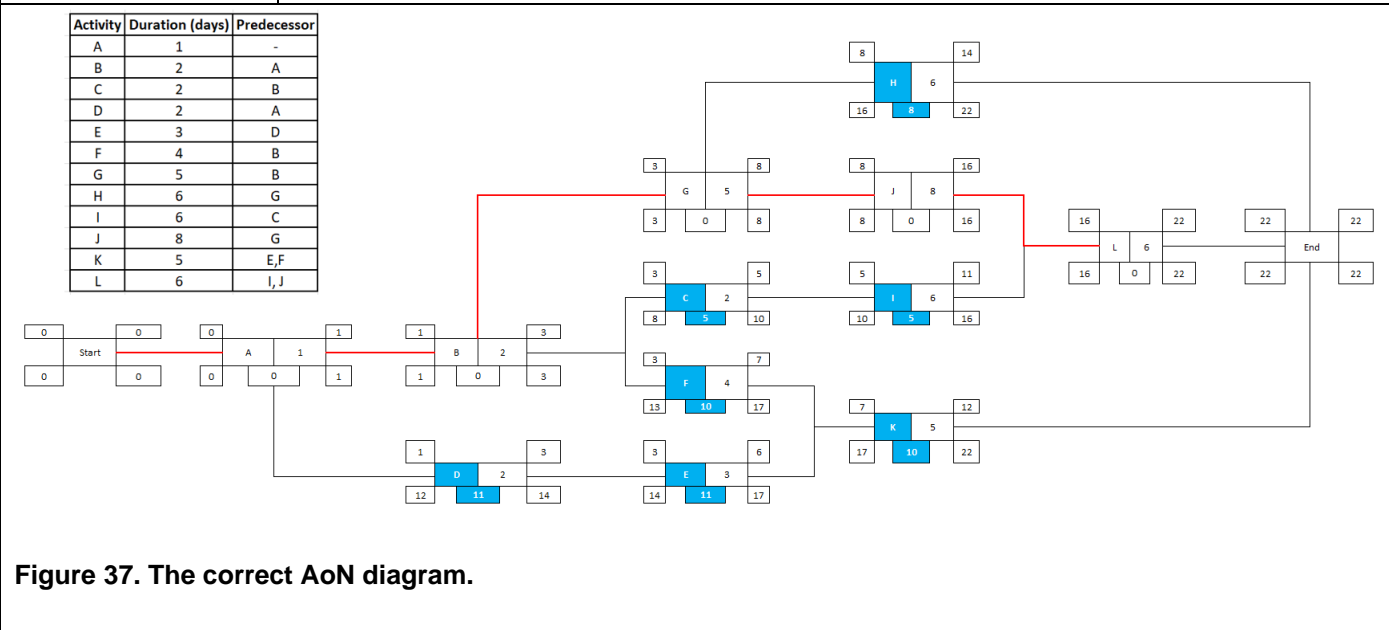
Figure 37. The correct AoN diagram.

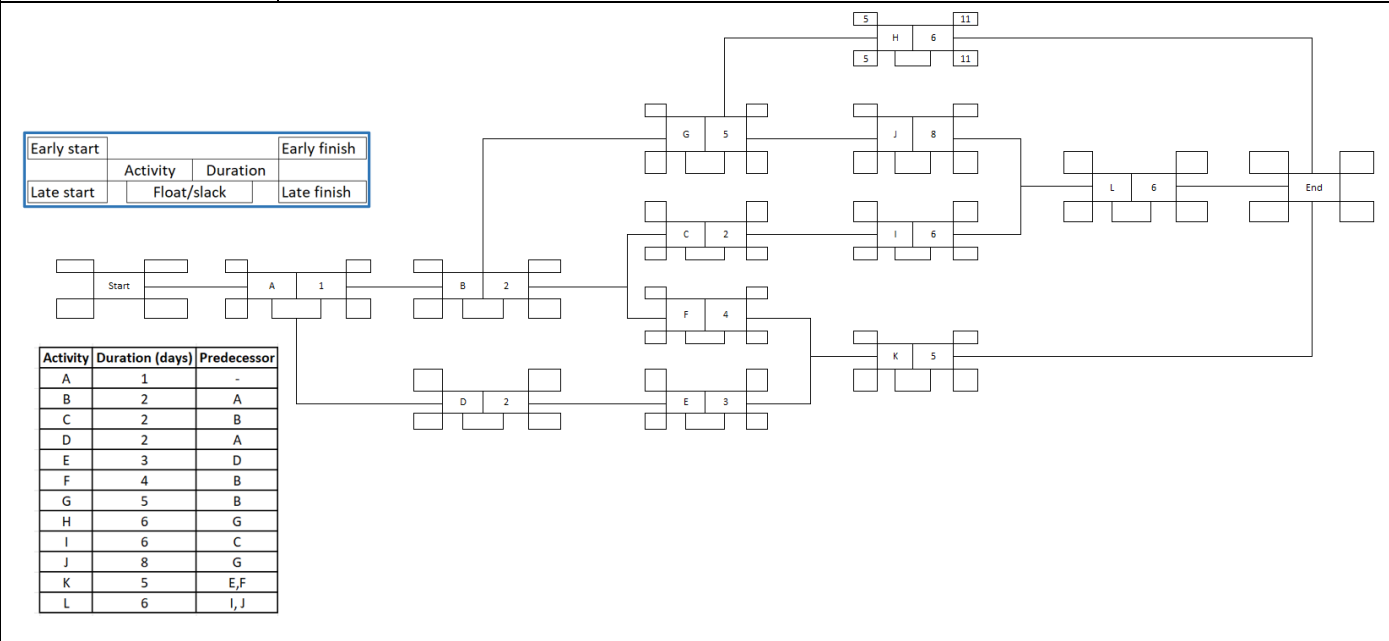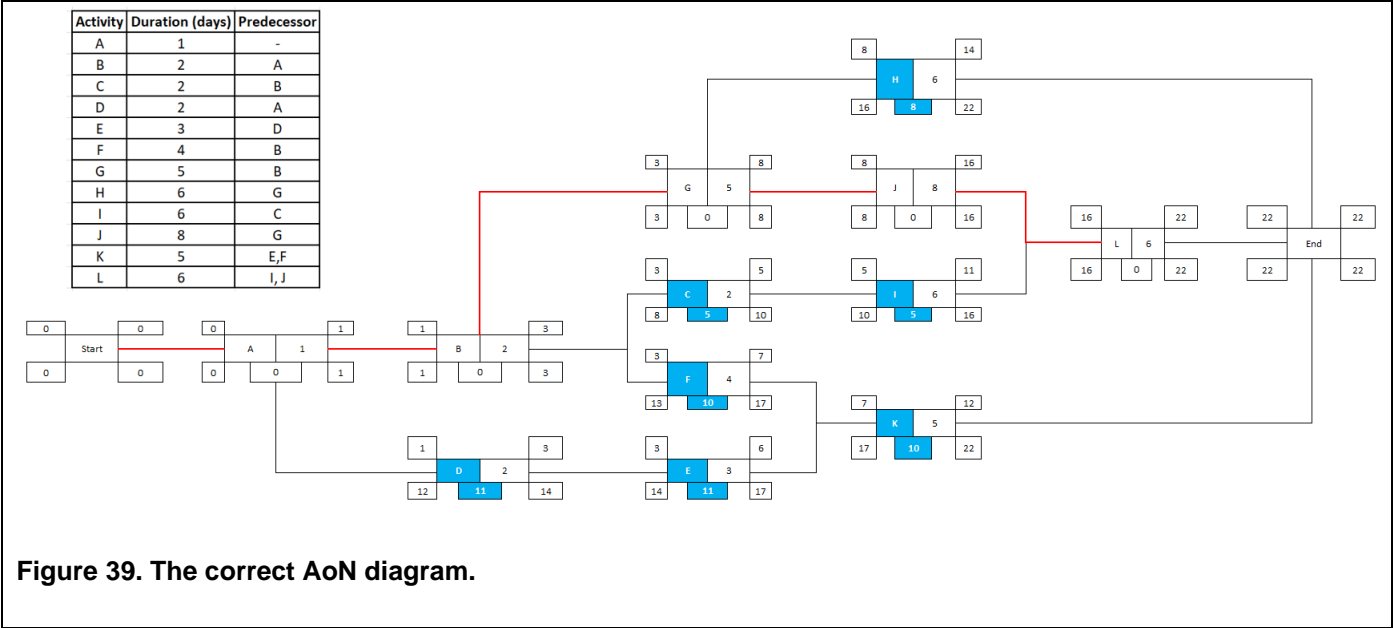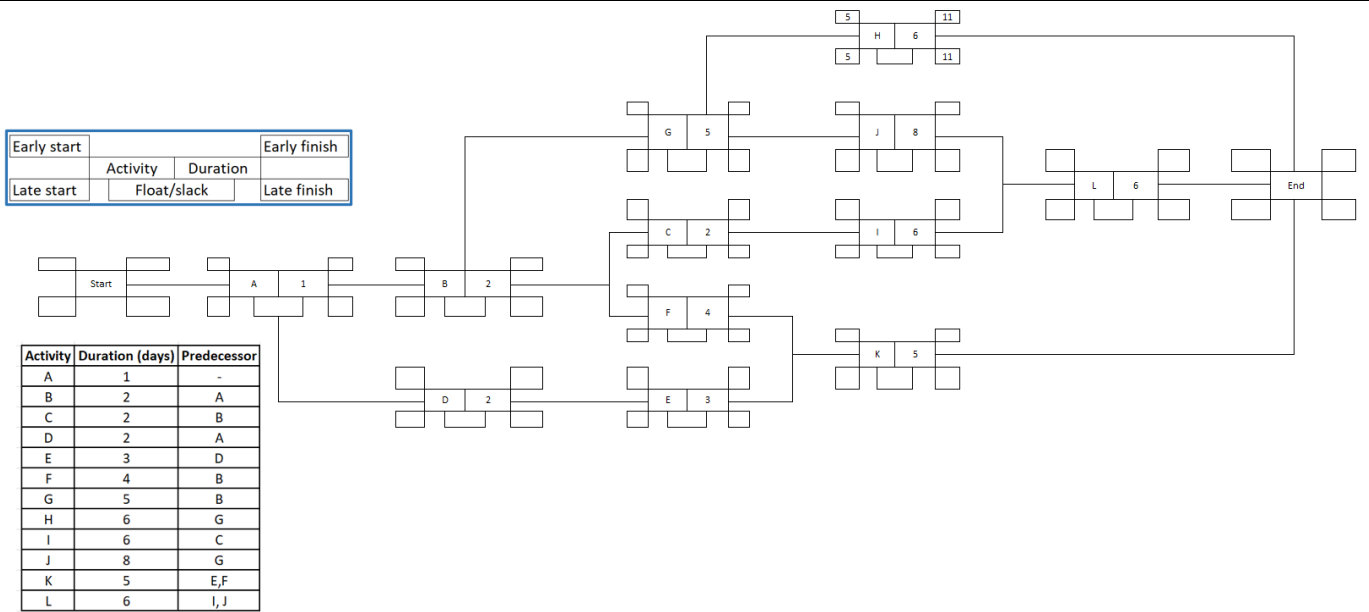| 37.	Study the activity list and its network diagram. Identify the critical path(s).

Figure 38. The activity-on-node diagram.

a	A-B-G-H; A-B-F-K
b	A-B-G-H

c	A-B-G-H; A-B-G-J-L; A-B-F-K
d	A-B-C-I-L
Correct answer	The correct answer should be A-B-G-J-L. The critical path is illustrated as the red path/line in Figure 39 below.

Activity	Duration (days)	Predecessor
A	1	-
B	2	A
C	2	B
D	2	A
E	3	D
F	4	B
G	5	B
H	6	G
I	6	C
J	8	G
K	5	E,F
L	6	I, J

Figure 39. The correct AoN diagram.

38.	Study the activity list and its network diagram. Calculate the early start, early finish, late start and late finish of Activity C.

Figure 40. The activity-on-node diagram.

Activity	Duration (days)	Predecessor
A	1	-
B	2	A
C	2	B
D	2	A
E	3	D
F	4	B
G	5	B
H	6	G
I	6	C
J	8	G
K	5	E,F
L	6	I, J

a	ES = 2, EF = 5, LS = 6, LF = 10
b	ES = 2, EF = 5, LS = 6, LF = 6
c	ES = 5, EF = 3, LS = 6, LF = 8
d	ES = 3, EF = 5, LS = 8, LF = 10
Correct answer	The correct answer should be ES = 3, EF = 5, LS = 8, and LF = 10, see the ES, EF, LS, and LF for Activity C in Figure 41 below.
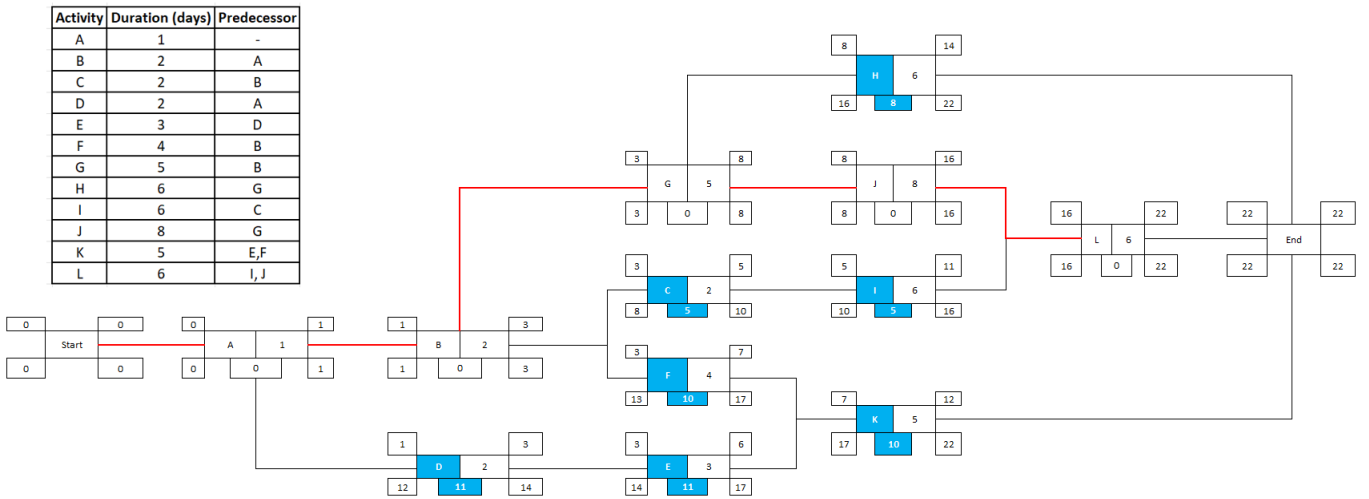
Figure 41. The correct AoN diagram.

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39.	Study the activity list and its network diagram. Which activities have slack?

Figure 42. The activity-on-node diagram.

a	C, D, E, I
b	C, I
c	A, G, C, I
d	None of the activities have slack
Correct answer	The correct answer should be C, D, E, F, H, I, K, see activities with slack highlighted in blue in Figure 43 below.

Figure 43. The correct AoN diagram.

	Study the information in Table 2. Calculate the weighted score for Project 1.
40.	 	Criteria	Weight	Project 1	Project 2	Project 3	 |---|---|---|---|---
A	40%	30	70	35
B	15%	70	30	50
C	25%	40	50	30
D	20%	20	60	40
Weighted project score					 Table 2
a	36.5
b	27.5
c	32.5
d	26.5
Correct answer	a

4. Sources consulted

Schwalbe, K. (2019). *Information technology project management* (9th ed.). Boston, USA: Cengage Learning.

University of Central Florida. (n.d.). Bloom's Taxonomy. Retrieved from University of Central Florida website: https://fctl.ucf.edu/teaching-resources/course-design/blooms-taxonomy/

5. Acknowledgment and dedication

I dedicate this tutorial letter to the students who brought errors and uncertainties to my attention.

6. In closing

I hope the solutions in this tutorial letter will clarify any uncertainties you have about Assessment 2. Also, this tutorial letter can be a good study guide to prepare for the forthcoming Assessment 3 and the final exam.

Thank you and best wishes,

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Enter Jiraiya's honoured sage style: Bath of boiling oil!