



NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

FACULTY OF APPLIED SCIENCES

DEPARTMENT OF APPLIED CHEMISTRY

PROJECT DEVELOPMENT AND MANAGEMENT

SCH 4210

End of Semester Examination Paper

December 2015

This examination paper consists of 4 pages

Time Allowed: 3 hours

Total Marks: 100

Special Requirements:

Examiner's Name: Mr Donatus Dube

INSTRUCTIONS

1. Answer any four (4) questions.
2. Each question carries 25 marks.
3. Use of calculators is permissible.

MARK ALLOCATION

QUESTION	MARKS
1.	25
2.	25
3.	25
4.	25
5.	25
TOTAL POSSIBLE MARKS	100

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1. a) The table below shows the outflow and inflow (values in \$1,000) of a small project.
- Draw the cash flow curves.
 - Comment on the cash flow of this project.
 - What could be done to ensure a positive cash flow during the period of the project?

	<u>Months</u>					
	1	2	3	4	5	6
<u>Outflow</u>						
Equipment	4	5	5	6	3	2
Material	3	6	6	8	3	2
Labour	2	2	3	3	2	1
Overheads	1	1	1	1	1	1
<u>Inflow</u>						
Payments	-	14	22	20	12	20

(15 marks)

- b) Describe the five Kilman approaches to resolving conflicts and give examples of when each approach is most appropriate to use. (10 marks)

2. A project has an original budget of \$600 000 and after the first 4 months of a 12 months planned project time, the Scheduled Costs, Actual Costs and Earned Values are as follows:

	Month 1	Month 2	Month 3	Month 4
Scheduled Cost	32 000	60 000	150 000	240 000
Actual Costs	35 000	70 000	160 000	250 000
Earned Value	30 000	50 000	140 000	230 000

- Draw the three curves, Scheduled, Actual & Earned Value.
- Calculate the Cost Variance for month 4.
- Calculate the Schedule Variance (cost based) for month 4.
- Find the Schedule Variance (time based) for month 4.
- Calculate the CPI for month 4.
- Calculate the SPI (cost based) for month 4.
- Find the SPI (time based) for month 4.
- Calculate the estimated final cost of the project.
- Calculate the estimated final completion time of the project.

(25 marks)

3. The activities of a project have the following durations, dependencies and resources (operatives):

<i>Activity</i>	<i>Duration (weeks)</i>	<i>Dependency</i>	<i>Resource (operatives/week)</i>
A	2	–	3
B	4	A	6
C	6	B	4
D	3	A	2
E	7	B & D	8
F	5	C	5
G	2	F	4
H	1	C & E	6
J	4	E	8
K	6	H	3
L	3	J	2
M	2	K & L	4
N	4	G & K	5
O	2	N & M	6
P	2	O	2

- i. Draw the network. (A-o-N).
- ii. Calculate all the total floats.
- iii. Calculate all the free floats.
- iv. Mark the critical path on the diagram. (25 marks)

4. Using the information from question 3,

- a) Draw the bar chart from the network.
- b) Draw the histogram for the resources.
- c) Draw the cumulative resource “S” curve.
- d) How would you crash this project? (25 marks)

5. a) You are identifying key stakeholders for your small income generating project. Which people will you not include in any case and why? (5 marks)

b) Calculate the PERT estimate for the following: pessimistic=20, optimistic=10, realistic=17 (2 marks)

c) Your organization considers running a project which will entail an investment of \$1,000,000. The product from the project is forecasted to create revenues of \$250,000 in the first year after the end of the project and of \$420,000 in each of the two following years. What is the net present value of the project over the three years cycle at a discount rate of 10%? (5 marks)

d) You monitored figures on cost and planned/earned value for each individual project week until the data date at the end of the sixth week. What is the status of this project at this date?

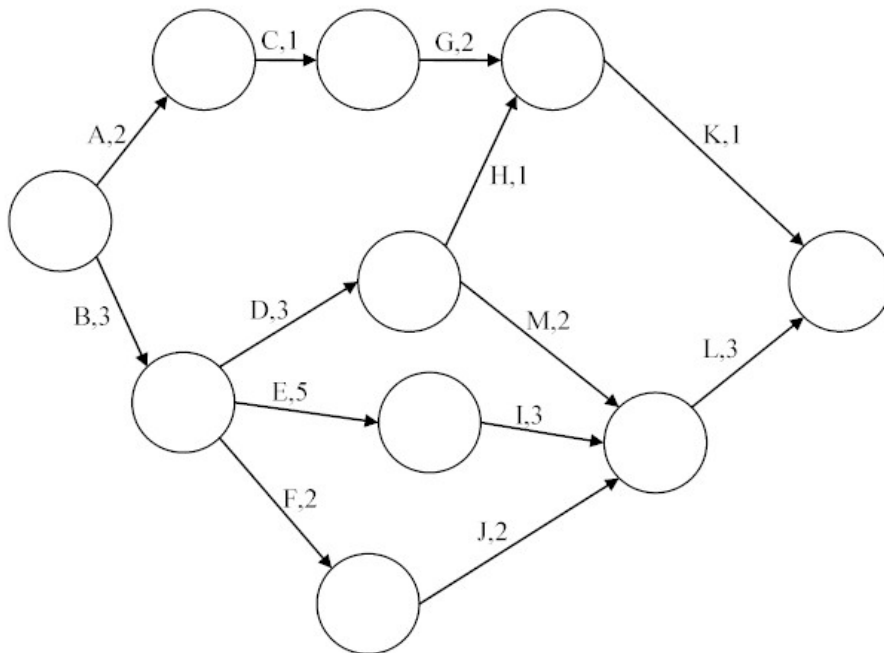
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Project week	Actual costs	Earned value	Planned value
1	\$65,000	\$61,000	\$67,000
2	\$85,000	\$79,000	\$89,000
3	\$100,000	\$102,000	\$110,000
4	\$125,000	\$124,000	\$121,000
5	\$135,000	\$133,000	\$139,000
6	\$125,000	\$120,000	\$131,000

(5 marks)

e) Post-mortem analysis after scheduled finish date of a project shows a CPI of 0.8 and an SPI of 1.25. What is a plausible explanation for that? (3 marks)

f) What is the critical path of this project? (5 marks)



.....*THE END*.....