



**PROGRAM** : NATIONAL DIPLOMA  
*CIVIL ENGINEERING TECHNOLOGY*

**SUBJECT** : **MANAGEMENT: CIVIL II**

**CODE** : **CEM 2211**

**DATE** : MAIN EXAMINATION

6<sup>th</sup> of JUNE, 2019

**DURATION** : (SESSION 1) 8:30 - 11:30

**WEIGHT** : 40 : 60

**TOTAL MARKS** : 100

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**EXAMINER** : MR. D.O AGHIMIEN

**MODERATOR** : DR. A. OPAWOLE

**NUMBER OF PAGES** : 3PAGES, 5 ANNEXURES

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**INSTRUCTIONS** :

1. POCKET CALCULATORS PERMITTED (ONLY ONE PER CANDIDATE)

### **QUESTION 1**

Populate the following activities on the bar chart. You only have a total of 26 working days to complete the project. You have a maximum of 8 labourers available per day. Show clearly the float on the bar chart. What is the total number of labourers required for the project?

Use ANNEXURE A to draw your bar chart.

Activity	Duration (days)	Predecessor	Labour
A	1	-	5
B	5	A	3
C	2	A	5
D	7	B	6
E	3	C	4
F	8	D	2
G	3	E, D	2
H	3	G, F	3
I	6	D	4
J	2	H, I	4

(20marks)

### **QUESTION 2**

You have won the contract to construct a gatehouse for a client. Use the information on the table below to draw a critical path network (CPN) on ANNEXURE B and thereafter complete the table on ANNEXURE C.

- Determine the duration of the project. (9marks)
- Determine the critical path of the CPN (7marks)
- Determine the float of each activity on the CPN (5marks)
- What will happen to the duration of the project if activity E is delayed by 1 day and activity G is delayed by 2 days (marks4)

Activity	Duration (Days)	Predecessor
A	2	-
B	3	-
C	1	-
D	2	A
E	8	A
F	2	B
G	5	C
H	3	C
I	4	D
J	8	D
K	6	E, F, G
L	2	H
M	6	I
N	7	J, K, L

(25marks)

### **QUESTION 3**

The table below shows the duration and cost of three different options on a construction project. Use ANNEXURE D and ANNEXURE E to determine the following:

- i. The total duration and cost using the normal option (Overheads of R2800) (8marks)
- ii. The total duration and cost using the double shift option (Overheads of R3200) (8marks)
- iii. The optimum cost and duration for the project (Overheads of R3000) (14marks)

Use only the first 3 rankings for the optimum option

Activity	Normal Time		Double Shift	
	Duration (Wk)	Cost	Duration (Wk)	Cost
1-2	6	70 000	4	80 000
1-3	4	40 000	2	45 000
2-4	5	30 000	3	40 000
2-5	3	70 000	1	90 000
3-4	6	15 000	4	15 000
4-6	8	10 000	4	13 000
5-6	4	12 000	2	14 000
6-7	3	40 000	2	52 000
Overhead	2800		3200	

**(30marks)**

### **QUESTION 4 (25 Marks)**

- i. Briefly describe planning and the different phases involved in construction planning? (4marks)
- ii. The decision to tender or not to tender depends on certain factors. Mention 5 of these factors. (5marks)
- iii. A pre-tender planning team consist of several members. Mention 2 members of the planning team and give 2 responsibilities for each. (6marks)
- iv. Describe a contract of employment. (4marks)
- v. Mention 3 important items to be specified in a contract of employment. (6marks)

**(25marks)**

### ANNEXURE A (Bar Chart)

Student Surname and initials: \_\_\_\_\_

Student Number: \_\_\_\_\_

[illegible]

**ANNEXURE B (CPN)**

Student Surname and initials: \_\_\_\_\_

Student Number: \_\_\_\_\_

### ANNEXURE C (CPN Table)

Student Surname and initials: \_\_\_\_\_

Student Number: \_\_\_\_\_

Activity	Duration (Days)	Predecessor	Start		Finish		Float
			Early	Late	Early	Late	
A	2	-					
B	3	-					
C	1	-					
D	2	A					
E	8	A					
F	2	B					
G	5	C					
H	3	C					
I	4	D					
J	8	D					
K	6	E, F, G					
L	2	H					
M	6	I					
N	7	J, K, L					

## ANNEXURE D (Crash Cost Table)

Student Surname and initials: \_\_\_\_\_

Student Number: \_\_\_\_\_

Activity	Normal Time		Double Shift		Time Saved	Added Cost	Cost Slope	Rank	Float	Optimum Cost	
	Dur. (Wk)	Cost	Dur. (Wk)	Cost						Dur. (Wk)	Cost
1-2	6	70 000	4	80 000							
1-3	4	40 000	2	45 000							
2-4	5	30 000	3	40 000							
2-5	3	70 000	1	90 000							
3-4	6	15 000	4	15 000							
4-6	8	10 000	4	13 000							
5-6	4	12 000	2	14 000							
6-7	3	40 000	2	52 000							
Overhead	2800		3200							3000	

## **ANNEXURE E (Crash Cost)**

Student Surname and initials: \_\_\_\_\_

Student Number: \_\_\_\_\_