UNIVERSITY
OF
JOHANNESBURG

PROGRAM	:	NATIONAL DIPLOMA *CIVIL ENGINEERING TECHNOLOGY*
SUBJECT	:	**MANAGEMENT: CIVIL II**
CODE	:	**CEM 2211**
DATE	:	SUPPLEMENTARY EXAMINATION 17 JULY, 2019
DURATION	:	(SESSION 2) 11:30 - 14:30
WEIGHT	:	40 : 60
TOTAL MARKS	:	100

EXAMINER	:	MR. D.O AGHIMIEN
MODERATOR	:	DR. A. OPAWOLE
NUMBER OF PAGES	:	2PAGES, 5 ANNEXURES

INSTRUCTIONS :

1. POCKET CALCULATORS PERMITTED (ONLY ONE PER CANDIDATE)

QUESTION 1

Use the information on the table below to draw a critical path network (CPN) on ANNEXURE A and thereafter complete the table on ANNEXURE B.

  i.   Determine the duration of the project.   (9marks)

  ii. Determine the critical path of the CPN   (7marks)

  iii. Determine the float of each activity on the CPN   (5marks)

  iv. 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   (4marks)

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

(25marks)

QUESTION 2

Use the information on the table below to draw a Precedence diagram on ANNEXURE C. Indicate the total duration of the project, the float, and the critical path.

Activity	Duration (Days)	Predecessor
A	5	First activity
B	7	Starts after A
C	9	Starts 3 days after A has ended
D	10	Starts after B
E	7	Starts 2days after B has ended
F	6	Starts after C
G	7	Starts after E, must starts 2 days after D has ended
H	9	Starts after E, F
I	4	Starts 1 day after F has ended
J	5	Starts after G, H
K	10	Starts after H, I
L	8	Starts after J, K

(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 R1500)

(8marks)

ii. The total duration and cost using the double shift option (Overheads of R1900)

(8marks)

iii. The optimum cost and duration for the project (Overheads of R1700)

(14marks)

Use only the first 3 rankings for the optimum option

Activity	Normal Time		Double Shift	
	Duration (Wk)	Cost	Duration (Wk)	Cost
1-2	8	25 000	6	29 000
1-3	6	33 000	5	35 000
2-4	12	15 000	10	18 000
2-5	4	60 000	3	64 000
3-4	5	27 000	4	30 000
4-6	9	9 000	7	11 000
5-6	8	25 000	6	27 000
6-7	10	50 000	8	54 000
Overhead	1500		1900	

(30marks)

QUESTION 4

i. In construction, risk abound. Mention 5 risks that may occur on construction projects.

(10marks)

ii. What is a method statement? (4marks)

iii. Several labour acts have been developed over the years in order to ensure a cordial relationship within the workplace. Mention 3 of these labour acts. (6marks)

iv. Explain the term labour relations? (3marks)

v. What is the role of trade unions in maintaining labour relations? (2marks)

(25marks)

ANNEXURE A (CPN)

Student Surname and initials: _____

Student Number: _____

ANNEXURE B (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	A					
D	2	B					
E	8	B					
F	2	C, D					
G	5	E					
H	3	F					
I	4	G, C					
J	8	H, I					

ANNEXURE C (Precedence Diagram)

Student Surname and initials: _____

Student Number: _____

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	8	25 000	6	29 000							
1-3	6	33 000	5	35 000							
2-4	12	15 000	10	18 000							
2-5	4	60 000	3	64 000							
3-4	5	27 000	4	30 000							
4-6	9	9 000	7	11 000							
5-6	8	25 000	6	27 000							
6-7	10	50 000	8	54 000							
Overhead	1500		1900							1700	

ANNEXURE E (Crash Cost)

Student Surname and initials: _____

Student Number: _____