



THE PAPUA NEW GUINEA UNIVERSITY OF TECHNOLOGY

EXAMINATION QUESTION PAPER MASTER

PROFORMA

Semester: 1 Academic Year: 2021

A. DEPARTMENT SECTION

I ACCEPT THAT THIS EXAMINATION PAPER SATISFACTORILY EXAMINES

Subject Code: CE312 Title: CONSTRUCTION ENGINEERING

Number of Questions: 7 Number of Pages: 54

1. Subject Examiner: MR. CHRIS KOBAL
Signature: [Signature] Date: 17/06/21

2. Subject Co-Examiner: MS. GRACE WANTEPE
Signature: [Signature] Date: 17/06/21

3. Departmental Examinations Co-ordinator: Checked: YES NO (Please tick)
Signature: [Signature] Date: 17/06/21

4. Head of Department and Chief Examiner: Checked: YES NO (Please tick)
Comments:

- Nil -

Signature: [Signature] Date: 17/06/21

B. EXAMINATIONS OFFICE SECTION

Examination Masters Received: YES NO

5. Examinations Officer Signature: _____ Date: _____

6. Witness Signature: _____ Date: _____



THE PAPUA NEW GUINEA UNIVERSITY OF TECHNOLOGY
DEPARTMENT OF CIVIL ENGINEERING -3RD YEAR DEGREE

FIRST SEMESTER EXAMINATIONS - 2021

CE 312 – CONSTRUCTION ENGINEERING

DATE: FRIDAY, 18TH JUNE 2021 – 08:20 A.M

VENUE: C004/5

TIME ALLOWED: 3 HOURS

INFORMATION FOR CANDIDATES

1. You have 10 minutes to read the paper before the examination starts. You must **not** begin writing during this time.
2. **There are SEVEN (7) Questions in this Exam Paper. Answer any FOUR (4) questions, for a total of 40 Points.**
3. Use only ink. Do not use pencils for writing except for drawings and sketches.
4. Only Calculator is allowed in the examination room. MOBILE PHONE is not allowed (Switch your Mobile Phones OFF). Notes and textbooks are not allowed.
5. Start each question on a new page and show all your calculations in the answer book provided. No other material will be accepted.
6. **Write your NAME and Student NUMBER clearly on the front page.**
Do it now.
7. **Marking Scheme:** All questions carry equal marks.

Question One

Planning – Short Answers

(10 marks)

- a)
 - i) Describe what pre-tender planning is for a project.
 - ii) Describe what post contract planning is for a project.
- b) Who should plan in a small organization?
- c) Who should plan in a large organization?
- d) List and describe two of the advantages of Planning?
- e) List and describe two types or Methods of Tendering.
- f) Define the following terms as they apply to project planning:
 - i) Free Float and Total Float.
 - ii) Forward Pass and Backward Pass for a project network
- g) Describe what pre-tender planning is for a project.

Question Two

Contracts and Tendering (Short Answers)

(10 marks)

- a) List and describe two Methods of Tendering.
- b) Describe briefly what Selective tendering is. Give an example.
- c) In a Contract Documentation, what is one of the purposes of the Specifications?
- d) Define what a Contract is in engineering construction context.
- e) Describe the relationships between the Client, Engineer, and Contractor
- f) What is the advantage of using a Precedence Diagram Network analysis to plan a project, over the Arrow network?

Question Three

(Bar Charts)

(10 marks)

- a) How is a Resource histogram related to the Bar chart for a project?
- b) Describe two types of bar charts, e.g., Linked bar chart
- c) Describe two advantages of using the bar Chart method.
- d) Describe two limitations of using the bar Chart method.

Question Four

(10 marks)

- a) Describe the following Critical Path Method – Activities on the Arrow. Use sketches if you want to.
- b) Analyze the network given below in **Figure Q4/5**, determine the duration of the project.
- c) Show the critical path for the network

Question Five

(10 marks)

- a) Describe the following Critical Path Method – Activities on the Node. Use sketches if you want to.
- b) Analyze the Network given below in **Figure Q4/5**, determine the duration of the project.
- c) Show the critical path for the network.

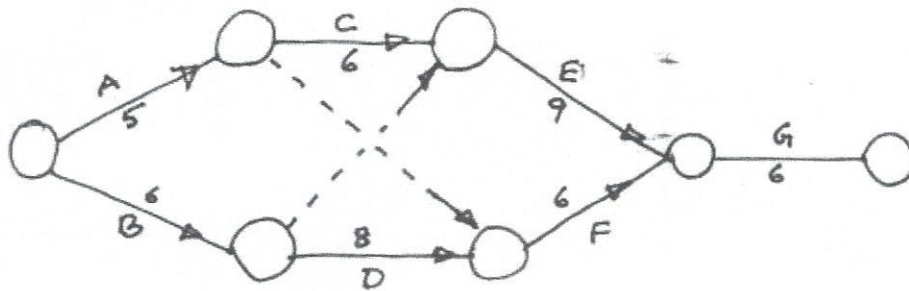


Figure Q4/5

Question Six

Networks

(10 marks)

- a) What is a network diagram?
- b) For the Critical Path Analysis Method, what is the major consideration for the:
 - (i) Forward pass; and,
 - (ii) Backward pass?
- c) State one of the major differences between the Critical Path Methods: Arrow Network; and, Precedence Network.
- d) Fill in the blanks for the following network in **Figure Q6** for a small building project using the forward and backward pass.

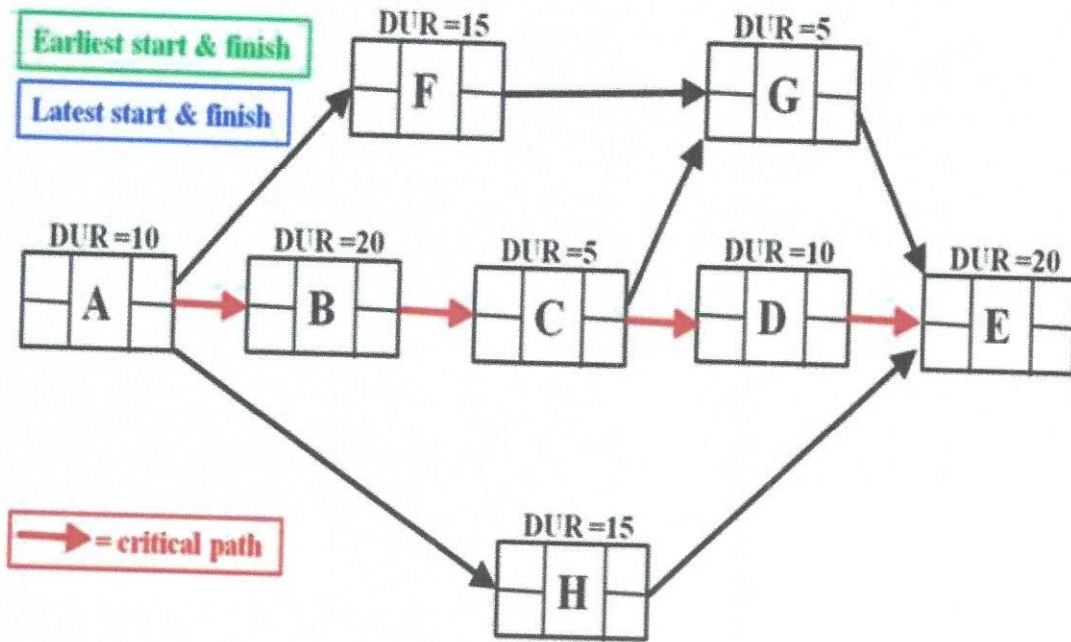


Figure Q6

Question Seven

(10 marks)

A set of project activities is given below, with dependencies, and time durations.

- (i) Construct a Network diagram (arrow or precedence) for the project, and,
- (ii) Analyze the Network by drawing the critical path on the network diagrams and determine the project duration.

Table Q7

Activity	A	B	C	D	E	F	G	H	I
Activity Duration	4	2	3	2	1	4	4	3	5
Depends on	Starting activity	Starting Activity	A	B	C & D	E	F	G	H

END OF EXAMINATION. ALL THE BEST!