

**UNIVERSITY OF BOLTON**

**SCHOOL OF ENGINEERING**

**BENG (HONS) CIVIL ENGINEERING**

**SEMESTER ONE EXAMINATION 2023/2024**

**CONSTRUCTION MANAGEMENT & DIGITAL SKILLS**

**MODULE NO: CIE5014**

Date: Monday 8<sup>th</sup> January 2024

Time: 10:00 – 12:00

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**INSTRUCTIONS TO CANDIDATES:**

This exam paper contains two sections: section 'A' and section 'B'

Section A contains TWO questions: you must answer these TWO questions. They are worth 70 marks.

Section B contains TWO questions: you should answer ONLY ONE of them. Each of these questions is worth 30 marks.

Marks for parts of questions are shown in brackets.

This exam paper carries 100 marks.

All working must be shown.

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### Section A – Answer Both Questions

#### Question One

**Table Q1** contains 11 construction activities and their duration (in **days**) in a project. The table also shows the immediate predecessor for each activity (s) as well as the constraints, Finish to Start (**FS**), of some activities (in **days**) from a specific predecessor.

Activity	Duration	Preceded By	FS
A	2	–	
B	5	A	2
C	6	A	
D	6	B	
E	7	B	3
F	4	B, C	
G	5	C	
H	10	D, E	
I	8	F	2
J	7	E, F, G	
K	1	D	
		H, J	
		I	1

Table Q1

Complete the following tasks:

- Draw a network diagram for the above activities using a Precedence Diagram. **(10 marks)**
- Carry out forward and backward passes to determine earliest & latest start times and earliest & latest finish times for each activity, the network critical path and the project duration. **(15 marks)**
- Calculate the Total Float (TF) and Total Time Available (TTA) for all activities. **(10 marks)**
- If the construction manager discovered that the duration of activity G should be 8 days instead of 5 days, and that of activity J should be 10 days instead of 7 days. Explain how this would affect the network critical path and the total duration of the project. **(5 marks)**

**Total 40 marks**

**Please turn the page...**

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### Question Two

Health and Safety (H & S) is one of the key objectives of any construction project. There are legal and commercial reasons why H & S should be a priority for all construction organisations. It can affect, and be affected by all the other project objectives.

Within this context answer the following:

- (a) Discuss when H & S management should start in a construction project and give two examples of that. **(10 marks)**
- (b) Briefly discuss the regulations govern H & S in the UK Construction Industry. **(10 marks)**
- (c) Discuss the ways by which we can control H & S in a construction site. **(10 marks)**

**Total 30 marks**

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**Section B – Answer Only One Question**

**Question Three**

The losses arising from poor materials management are probably the largest single contributor to the loss of money within any construction company. On many construction projects the materials content (inclusive of the cost of unloading, storing & transporting them around the site), can add up to well over half the contract value.

- (a) Explain any four common causes of materials wastage associated with construction projects. **(10 marks)**
- (b) Describe how the following processes may improve the control of materials wastage and thus reduce the amount of money lost on a project:-
- (i) Accurate requisitioning **(7 marks)**
  - (ii) Quality control **(7 marks)**
  - (iii) Storage of materials **(6 marks)**

**Total 30 marks**

**Question Four**

(a) Appraise the value of various parts of the Building Cost information Service in accurately predicting the cost of construction projects.

**(15 marks)**

(b) Discuss difficulties experienced by the construction sector when forecasting costs of major projects in current market conditions.

**(15 marks)**

**Total 30 marks**

**END OF QUESTIONS**