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**UNIVERSITI TUN HUSSEIN ONN MALAYSIA**

**FINAL EXAM  
SEMESTER I  
SESSION 2014/15**

COURSE NAME : SUSTAINABLE CONSTRUCTION  
MANAGEMENT  
COURSE CODE : BFC 32703  
PROGRAMME : 3 BFF  
EXAMINATION DATE : DECEMBER 2014/JANUARY 2015  
DURATION : 3 HOURS  
INSTRUCTION : ANSWER **TWO (2)** QUESTIONS  
IN **SECTION A**, AND **ALL**  
QUESTIONS IN **SECTION B**.

THIS QUESTION PAPER CONSISTS OF **SIX (6)** PAGES

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**SECTION A**

**Q1** A sustainable construction focuses on increasing the efficiency of resource use. The construction of sustainable building should be designed and operated to reduce negative impacts to the built environment.

- (a) Briefly explain the meaning of sustainable development. (2 marks)
- (b) Explain the three dimensions of sustainability in construction. (6 marks)
- (c) Draw a diagram to show possible strategies that can be implemented to improve sustainability in buildings' construction. (5 marks)
- (d) Discuss **five (5)** key criteria, which will be considered in the assessment for Green Building Index (GBI). (10 marks)
- (e) Describe **one (1)** of the green building features in the Diamond Building (the headquarters of energy commission of Malaysia, Putrajaya). (2 marks)

**Q2** A list of activities to complete a project is shown in Table **Q2**. Based on that table,

- (a) Construct a precedence network diagram and compute the Early Start (ES), Early Finish (EF), Late Start (LS), Late Finish (LF), the link lags and Total Float (TF) for each activity. (15 marks)
- (b) State the critical activities of the network diagram. (2 marks)
- (c) Based on the calendar shown in Figure **Q2**, prepare a bar chart for the project. Assume that the project is started on 1<sup>st</sup> November 2014 and consider all holidays are non-working days. (8 marks)

**Q3** Table **Q3** lists the construction activities involved for a school building in Batu Pahat, Johor. Based on the information given:

- (a) Draw an activities network using the Arrow Diagram Method (ADM). (2 marks)
- (b) Determine the total project duration and list out the critical activities. (3 marks)
- (c) Calculate Early Start (ES), Early Finish (EF), Late Start (LS), Late Finish (LF) and Total Float (TF), then list each of them in an appropriate table. (5 marks)
- (d) Draw a bar chart of the project according to Early Start and show Total Float. (5 marks)
- (e) Allocate the required resources, and then level them so that the subcontractors do not use more than **nine (9)** labourers at any time. Assume that any labourer can perform any task. (10 marks)

## SECTION B

**Q4** Decision in selecting an appropriate project delivery method is vital to ensure the successful of a construction project.

- (a) Describe briefly **two (2)** advantages and disadvantages respectively of design and build project delivery. (8 marks)
- (b) The implementation of ICT utilization in construction especially design and build approach is able to smooth the project progress. Discuss **four (4)** causes that may become main obstacles in ICT implementation. (8 marks)
- (c) Based on your understanding, describe the difference features of three project delivery methods namely; 1) Design and Build, 2) Construction Management (PMC) and 3) Owner-Builder Arrangement. (9 marks)

**Q5** Total Quality Management (TQM) is a managerial philosophy which aims to achieve organisation's main targets using all sources including employees. There are five (5) TQM principles including 1) teamwork, 2) employee participation, 3) customer focus, 4) continuous improvement and 5) process focus.

(a) Explain the **six (6)** basic supporting elements, which stated by Tenner and Detoro, 1992 to achieve all the Total Quality Management's (TQM) principles.

(12 marks)

(b) Discuss the following types of construction insurance:

- i. Builder's risk insurance
- ii. Comprehensive general liability insurance
- iii. Worker's compensation and employer's liability insurance

(9 marks)

(c) Explain the following strategies that can be taken to improve efficiencies in managing construction materials:

- i. Devising control over raw materials
- ii. Fixing standards and specifications

(4 marks)

- **END OF QUESTION** -

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**TABLE Q2**

Activity	Duration (days)	Predecessor (s)	Link type	Lead/ Lag time
A	4	-	Finish to Start	-
B	3	-	Finish to Start	-
C	6	A, B	Finish to Start	-
D	5	B	Finish to Start	Lag 1 day
E	10	D	Start to Start	Lead 2 days
F	2	C	Finish to Start	-
G	5	E,F	Finish to Start	-
H	12	E	Start to Start	Lead 3 days
I	4	G	Finish to Start	-
J	5	F,G	Finish to Start	-
K	6	H,I	Finish to Start	-
L	3	J,K	Finish to Start	-

November 2014						
S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

December 2014						
S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

 Holiday

**FIGURE Q2**

**FINAL EXAMINATION**

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COURSE NAME : SUSTAINABLE CONSTRUCTION MANAGEMENT  
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<b>Activity</b>	<b>Predecessor</b>	<b>Duration (day)</b>	<b>Labour (man/day)</b>
A	-	4	4
B	A	4	4
C	A	6	3
D	B	5	6
E	C	2	4
F	C	3	2
G	D,E	4	4
H	F	5	2
J	G,H,C	4	4