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UNIVERSITI TUN HUSSEIN ONN MALAYSIA

**FINAL EXAMINATION
SEMESTER I
SESSION 2013/2014**

COURSE NAME : SUSTAINABLE CONSTRUCTION
MANAGEMENT
COURSE CODE : BFC 32703 / BFC 3163
PROGRAMME : 3 BFF / 4 BFF
EXAMINATION DATE : DECEMBER 2013/JANUARY 2014
DURATION : 3 HOURS
INSTRUCTION : A) ANSWER ALL QUESTIONS
IN SECTION A
B) ANSWER **ONE (1)**
QUESTION IN SECTION B
C) PLEASE ATTACH FIGURE
Q2(A) AND Q3(D) IN YOU
ANSWER BOOKLET

THIS QUESTION PAPER CONSISTS OF **TEN (10)** PAGES

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SECTION A

Q1 Imagine that you are working for the main contractor as a Construction Manager. Since the newly secured construction project of a two-storey bungalow needs to be implemented with several sustainable strategies in order to fulfil client's requirements, you are responsible to present a brief proposal to the client on the followings:

(a) Construct a site phase diagram complete with their general activities (from site possession to handover);

(6 marks)

(b) Select **two (2)** sustainable construction strategies which coincide with all important resources (4M's) in construction. Each selection must be followed by a brief justification. For example: Money – a sustainable strategy – justification; Manpower – a sustainable strategy – justification; etc. You may use table to separate each selection.

(9 marks)

(c) Organize and embed your selected sustainable construction strategies as described in (b) and on your site phase diagram drawn in (a) where appropriate.

(4 marks)

(d) Summarize a brief conclusion based on Q1(c) to your client.

(6 marks)

Q2 (a) Solve the crossword puzzle as shown in Figure **Q2(a)**. (6 marks)

(b) A list of activities to complete a project is shown in Table **Q2(b)**. Based on the calendar given in Figure **Q2(b)**, construct a planning and actual physical S-Curve for the project. Consider holiday as non-working day. (12marks)

Table **Q2 (b)**

Activity	Duration (days)	Cost (RM)	Start Date	Actual Start Date	Actual Finish Date
Activity A	2	1,200	6/9/13	6/9/13	7/9/13
Activity B	3	3,300	8/9/13	8/9/13	13/9/13
Activity C	8	12,000	10/9/13	13/9/13	23/9/13
Activity D	6	18,000	15/9/13	20/9/13	27/9/13
Activity E	5	8,000	23/9/13	24/9/13	30/9/13

(c) SWM Environment Sdn. Bhd is considering to buy a new waste collection vehicles to upgrade their services. The estimated costs and benefits that are expected from two alternatives under their consideration are indicated in Table **Q2(c)**. Each of the vehicles has useful life of 10 years and the nominal rate of interest is 8% per year. Using the modified benefit-cost analysis, choose the best alternative. (7 marks)

Table **Q2 (c)**

	Alternative A	Alternative B
Initial cost	RM 800,000	RM 1,200,000
Annual O&M costs	RM 75,000	RM 78,000
Salvage value	RM 100,000	RM 125,000
Annual benefits	RM 200,000	RM 225,000

(d) Give **three (3)** examples of fixed capital cost involve in a construction project. (5 marks)

- Q3**
- (a) Explain **two (2)** principles of implementing a sustainable concept in construction. (6 marks)
 - (b) Describe the application of lean construction in construction project. (3 marks)
 - (c) Organizing is one of management function in organizational approach. Give **four (4)** managers' role in organizing function. (4 marks)
 - (d) A project consists of ten activities was arranged in a network shown in Figure **Q3(d)**. Manually solve the resource levelling problem with a maximum of **five (5)** labourers per day from day-1 until day-11, and **seven (7)** labourers per day from day-12 until day-21. (12 marks)

SECTION B

- Q4** (a) A list of activities that are required to complete a project is shown in Table **Q4(a)**. Based on the table:

Table **Q4(a)**

Item	Activity	Duration (day)	Predecessor
1	A	2	-
2	B	3	A
3	C	4	A
4	D	2	A
5	E	3	B
6	F	2	C
7	G	3	D
8	H	4	C,E
9	I	2	F,G
10	J	3	G
11	K	1	H,I,J

- (i) Develop an arrow diagram for the project complete with their Early Start (ES) and Early Finish (EF) for each activity. (8 marks)
- (ii) Evaluate total float for activity G and J. (2 marks)
- (b) Information and communication technology (ICT) is a vital tool in managing information. Explain the need of information management in construction industry. (6 marks)
- (c) Describe **four (4)** principles of planning and scheduling. (4 marks)

- Q5** (a) A list of activities that are required to complete a project is shown in Table **Q5(a)**. Based on the table:

Table **Q5(a)**

Item	Activity	Duration (day)	Predecessor(s)
1	A	5	-
2	B	3	A
3	C	2	A
4	D	4	A
5	E	4	B
6	F	3	E (SS+3)
7	G	5	C (FS+4), D
8	H	5	E
9	I	4	H (FF-1)
10	J	3	F,G
11	K	2	I,J (FS-1)

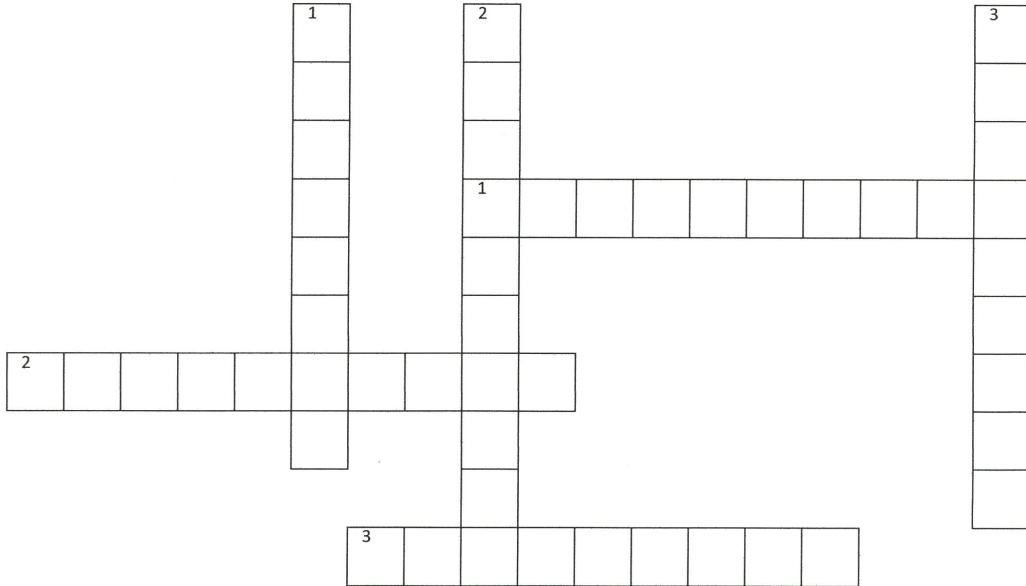
- (i) Develop a precedence diagram for the project. (8 marks)
- (ii) Select the critical activity for the project. (2 marks)
- (b) Give **three (3)** problems in implementing information and communication technology (ICT) in construction industry. (6 marks)
- (c) List **four (4)** importances of work breakdown structure in planning. (4 marks)

- END OF QUESTION -

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Across:

1. A factor in selecting organizational structure
2. A criteria for GBI
3. A component in project cost

Down:

1. _____ activity having zero total float time
2. A type of organizational structure
3. A possible sustainable strategy for material

FIGURE Q2(a)

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September 2013						
M	T	W	T	F	S	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		

October 2013						
M	T	W	T	F	S	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(b)

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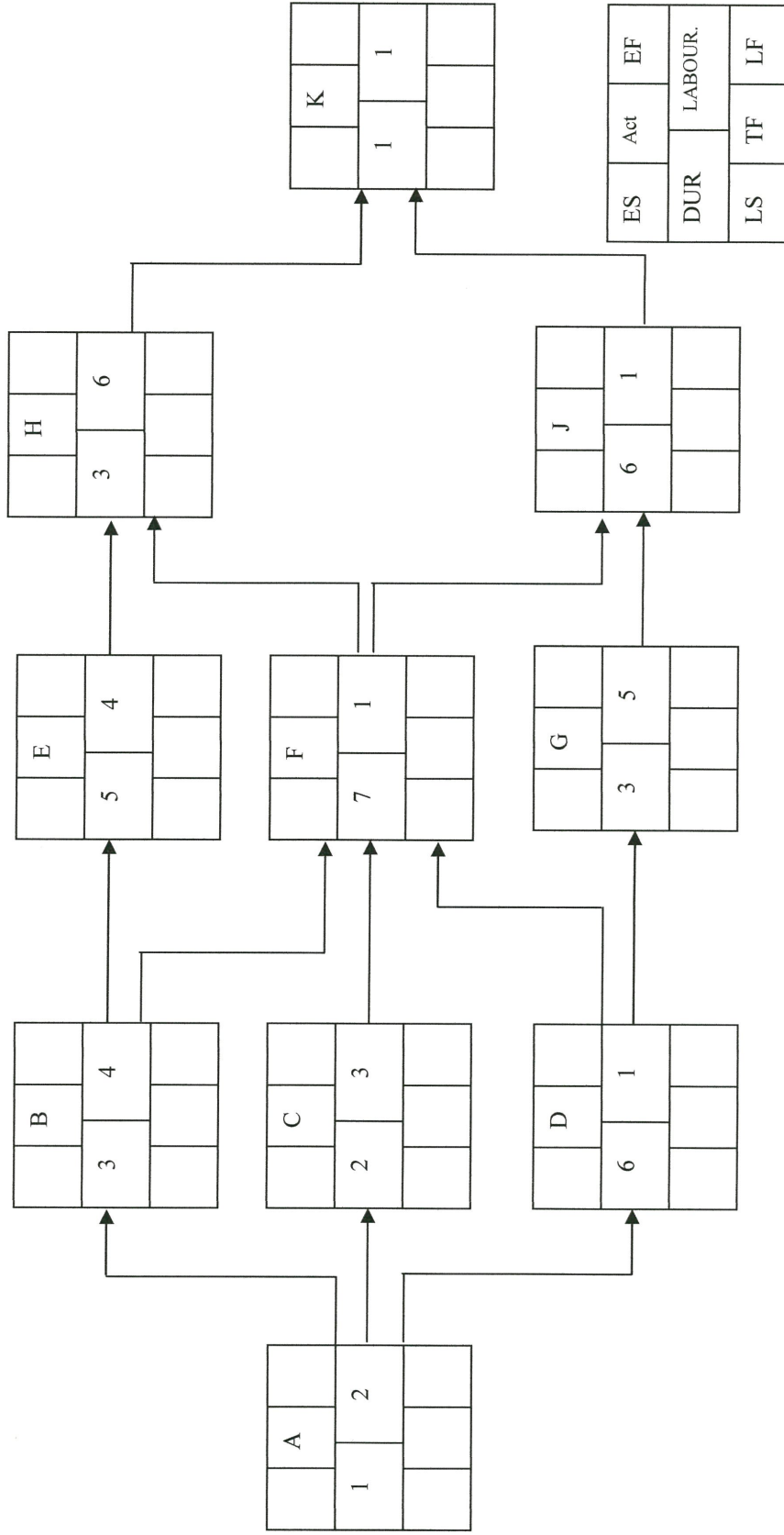


FIGURE Q3(d)

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BFC 3163**APPENDIX**

8%		Compound Interest Factors						8%	
Single Payment			Uniform Payment Series			Arithmetic Gradient			
	Compound Amount Factor Find <i>F</i> Given <i>P</i> <i>F/P</i>	Present Worth Factor Find <i>P</i> Given <i>F</i> <i>P/F</i>	Sinking Fund Factor Find <i>A</i> Given <i>F</i> <i>A/F</i>	Capital Recovery Factor Find <i>A</i> Given <i>P</i> <i>A/P</i>	Compound Amount Factor Find <i>F</i> Given <i>A</i> <i>F/A</i>	Present Worth Factor Find <i>P</i> Given <i>A</i> <i>P/A</i>	Gradient Uniform Series Find <i>A</i> Given <i>G</i> <i>A/G</i>	Gradient Present Worth Find <i>P</i> Given <i>G</i> <i>P/G</i>	<i>n</i>
1	1.080	.9259	1.0000	1.0800	1.000	0.926	0	0	1
2	1.166	.8573	.4808	.5608	2.080	1.783	0.481	0.857	2
3	1.260	.7938	.3080	.3880	3.246	2.577	0.949	2.445	3
4	1.360	.7350	.2219	.3019	4.506	3.312	1.404	4.650	4
5	1.469	.6806	.1705	.2505	5.867	3.993	1.846	7.372	5
6	1.587	.6302	.1363	.2163	7.336	4.623	2.276	10.523	6
7	1.714	.5835	.1121	.1921	8.923	5.206	2.694	14.024	7
8	1.851	.5403	.0940	.1740	10.637	5.747	3.099	17.806	8
9	1.999	.5002	.0801	.1601	12.488	6.247	3.491	21.808	9
10	2.159	.4632	.0690	.1490	14.487	6.710	3.871	25.977	10
11	2.332	.4289	.0601	.1401	16.645	7.139	4.240	30.266	11
12	2.518	.3971	.0527	.1327	18.977	7.536	4.596	34.634	12
13	2.720	.3677	.0465	.1265	21.495	7.904	4.940	39.046	13
14	2.937	.3405	.0413	.1213	24.215	8.244	5.273	43.472	14
15	3.172	.3152	.0368	.1168	27.152	8.559	5.594	47.886	15
16	3.426	.2919	.0330	.1130	30.324	8.851	5.905	52.264	16
17	3.700	.2703	.0296	.1096	33.750	9.122	6.204	56.588	17
18	3.996	.2502	.0267	.1067	37.450	9.372	6.492	60.843	18
19	4.316	.2317	.0241	.1041	41.446	9.604	6.770	65.013	19
20	4.661	.2145	.0219	.1019	45.762	9.818	7.037	69.090	20