

**CONFIDENTIAL**



**UNIVERSITI TUN HUSSEIN ONN MALAYSIA**

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

COURSE NAME : CONSTRUCTION PLANNING  
AND SCHEDULING  
COURSE CODE : BFP 4013 / BFP 40103  
PROGRAMME : 4 BFF  
EXAMINATION DATE : DECEMBER 2013/JANUARY 2014  
DURATION : 3 HOURS  
INSTRUCTION : ANSWER ALL QUESTIONS

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

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**Q1** Table **Q1** shows a part from the activities involve in a construction project at Taman Kejayaan, Batu Pahat. The duration of each activity given is in 'day' unit and the predecessors are as listed

- (a) Develop a Precedence Network Diagram (PDM) for the activities listed. Information of each activity should be displayed in a format as shown in Figure **Q1**.  
(12 marks)
- (b) Determine the Early Start (ES), Late Start (LS), Early Finish (EF), Late Finish (LF), Total Float (TF) and Free Float (FF) in an appropriate table.  
(10 marks)
- (c) Indicate clearly the critical activities.  
(1 mark)
- (d) Define the meaning of 'critical activity'.  
(2 marks)

**Q2** Network diagram for Project B construction is shown in Figure **Q2**. Duration and direct cost for every activity is listed in Table **Q2**.

- (a) Determine the total project duration for normal activities and show the route of the critical path for the project.  
(3 marks)
- (b) Crash the activities appropriately to get the shortest possible project duration.  
(10 marks)
- (c) In a tabulated table, list the total project duration after crashing program in **Q2(b)** and show their impact to the direct cost of the project.  
(3 marks)
- (d) Based on figure determine in **Q2(c)**, and estimated indirect cost, RM 270 per day, produce a crash curve to illustrate the costs-time relationship. Determine the most economic overall project duration.  
(9 marks)

**Q3** Table **Q3** shows list of construction activities involved for an administration building at the Universiti Tun Hussein Onn Malaysia. Based on the information given:

- (a) Develop a network diagram based on activity using Arrow Diagram Method (ADM) and calculate the event time. (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) Sketch a histogram of resources for each 'duration'. (5 marks)
- (f) Generate a 'resource leveling' for this project. (5 marks)

**Q4** To achieve a perfect contract and corporate objectives, it requires a detailed and well-organised planning. The responsibilities and related elements of every project parties and project matters should be determined.

- (a) With relevant examples, discuss **three (3)** outcomes that can be achieved from an effective project planning. (6 marks)
- (b) Briefly discuss **two (2)** steps in achieving good scheduling. (5 marks)
- (c) Line of Balance is a scheduling technique that most understood and used widely. Briefly discuss the **two (2)** advantages and **two (2)** disadvantages of this planning technique. (8 marks)
- (d) Explain **three (3)** functions of "Work Breakdown Structure (WBS)" in construction project. (6 marks)

**- END OF QUESTION -**

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**TABLE Q1**

<b>Activity ID</b>	<b>Description</b>	<b>Duration (day)</b>	<b>Predecessors</b>
A	Deliver materials on site	1	-
B	Installation of Formworks (Zone A)	8	A
C	Installation of Rebar (Zone A)	5	A (+2 days)
D	Superior Officer's Inspection (Zone A)	1	B, C
E	Concreting Works (Zone A)	3	D (Start to Start, +1)
F	Installation of Formworks (Zone B)	6	B
G	Installation of Rebar (Zone B)	4	C
H	Superior Officer's Inspection (Zone B)	1	E, F, G
I	Concreting Works (Zone B)	3	H (Start to Start, +1)
J	Dismantling of Formwork (Zone A)	4	E (+ 5 days)
K	Dismantling of Formwork (Zone B)	4	I (+5 days)
L	Section 1 Completed	1	J, K

Early Start (ES)	Duration (D)	Early Finish (EF)
Activity		
Late Start (LS)	Total Float (TF)	Late Finish (LF)

**FIGURE Q1**

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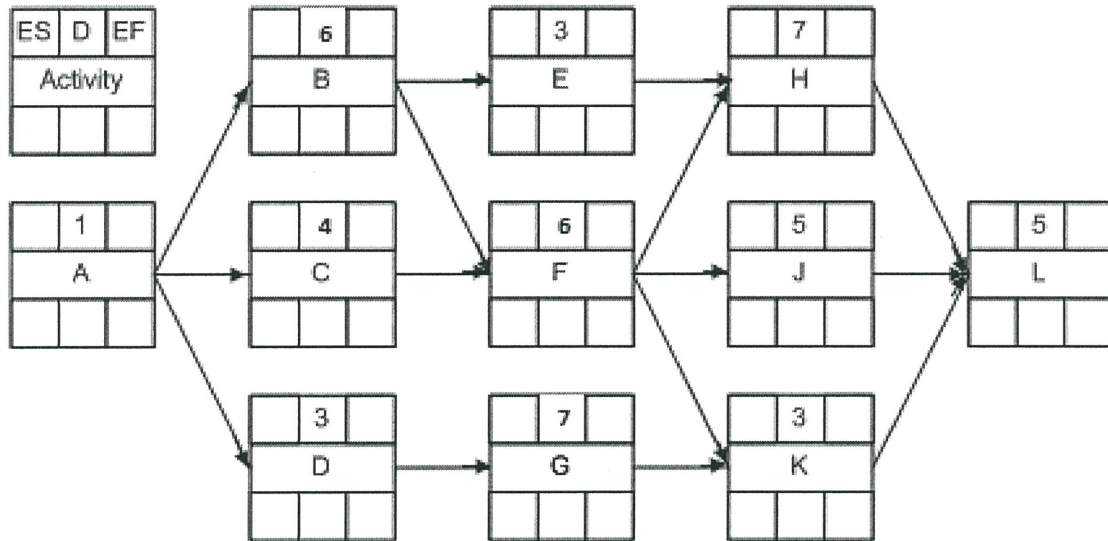
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**FIGURE Q2**

**TABLE Q2**

Activity	Duration		Normal Cost (RM)	Crash Cost (RM)
	Normal	Crash		
A	1	1	800	800
B	6	4	1,000	1,600
C	4	3	300	500
D	3	2	400	800
E	3	1	100	200
F	6	5	500	800
G	7	4	200	1,400
H	7	6	350	600
J	5	3	700	850
K	3	2	500	1,000
L	5	4	450	800

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**TABLE Q3**

<b>Activity</b>	<b>Predecessor</b>	<b>Duration (day)</b>	<b>Labour (man/day)</b>
A	-	2	4
B	-	3	4
C	A	2	3
D	B	4	6
E	B	3	4
F	C	1	2
G	C,D	1	4
H	F	2	2
I	E	1	5
J	H,G	2	4