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UNIVERSITI TUN HUSSEIN ONN MALAYSIA

**FINAL EXAMINATION
SEMESTER II
SESSION 2017/2018**

COURSE NAME : PROJECT PLANNING &
SCHEDULING

COURSE CODE : BPD 33903

PROGRAMME CODE : BPC

EXAMINATION DATE : JUNE / JULY 2018

DURATION : 3 HOURS

INSTRUCTION : ANSWER ALL QUESTIONS

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THIS QUESTION PAPER CONSISTS OF FIVE (5) PAGES

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- Q1**
- (a) Illustrate the five phases of a construction project as a project lifecycle curve. (5 marks)
 - (b) Describe the advantages of having a well-defined scope of work for a construction project. (4 marks)
 - (c) Describe **FOUR (4)** assumptions that are made regarding projects when using Critical Path Method (CPM) technique for project management. (8 marks)
 - (d) Calculate the duration in days for the following two tasks:
 - (i) Task A: 320 m³ of concrete to be poured on slab formwork by concreting crew with estimated productivity of crew at 10 m³ per hour. The concreting crew works 8 hours per day. (4 marks)
 - (ii) Task B: 1440 pieces of square homogenous tiles to be installed as flooring tiles with estimated productivity of two crews working concurrently. 1st crew productivity at 20 tiles per hour and 2nd crew productivity at 25 tiles per hour. (4 marks)

Q2 The common approach used by construction project management teams in order to overcome project delay is to use the crashing techniques. **Table Q2** provides information related to a building project that is experiencing delay.

Table Q2 : Project Information

Activity	Pre-decessor	Normal Time (NT) (weeks)	Normal Cost (NC) (RM)	Crash Time (CT) (weeks)	Crash Cost (CC) (RM)	Crash Cost per week (CC-NC/NT-CT) (RM)
A	-	6	200	4	500	
B	A	5	300	3	600	
C	A	4	100	2	300	
D	A	8	400	4	600	
E	B,C	4	700	2	1,000	
F	C	3	200	1	300	
G	D	8	300	6	500	
H	E	3	500	2	600	
I	F	2	400	1	500	
J	H,I	2	200	1	500	

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- (a) Prepare a precedence network diagram using the critical path method (CPM) for the building project according to the original project information provided in **Table Q2**. (8 marks)
- (b) Use the crashing method in order to resolve the problem of completing the building project according to the project information provided in **Table Q2** within a required period of 20 weeks without using the splitting or multitasking techniques.
 - (i) Explain the slope technique in choosing the activity to crash in **Table Q2**. (4 marks)
 - (ii) Prepare an updated CPM diagram after crashing the project that is to be completed within a period of 20 weeks. (6 marks)
 - (iii) Prepare a project information table based on the 20 weeks crashed project data, including the individual activity costing and final costing. (7 marks)

Q3 (a) One of the methods that can be used for the purpose of project planning that has repetitive activities is that of Linear Scheduling. The following information in **Table Q3** below refers to a road project of 90 km length.

Table Q3: Productivity Information of Flexible Road Construction Activities

ID	Activity	Productivity (km per day)	Activity Precedence
A	Land Survey and Layout	3	-
B	Site Clearance	5	A
C	Excavation and Levelling	4	B
D	Laying of Sub-base Course & Subgrade	3	C
E	Laying of Base Course	5	D
F	Laying of Surface Course	4	E

- (i) Illustrate a baseline (initial) Velocity Diagram using graph paper provided to indicate clearly activities that are scheduled that can have a conflicting situation.

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- (ii) Prepare a baseline (initial) Velocity Diagram stating clearly the buffer between subsequent activities that needs to be reconsidered in the planning and scheduling given in answer to **Q3(a)(i)** in order to avoid conflicts.
(8 marks)
- (iii) Identify the estimated completion period for the project planned in **Q3(a)(ii)** that does not have conflicts.
(2 marks)
- (b) Work progresses normally until at 40km distance on highway from the start of works, there is a landslide which delays the work of activity A by 10 days.
- (i) Prepare an updated Velocity Diagram stating clearly the buffer between subsequent activities that needs to be reconsidered in the planning and scheduling given in answer to **Q3(a)(ii)** in order to avoid conflicts.
(7 marks)
- (ii) Identify the estimated completion period for the project planned in **Q3(b)(i)**.
(2 marks)
- Q4** (a) Mr Jaafar, who is the owner of a proposed fishing farm in Mersing wants to complete excavating 4 fish ponds in 4 weeks. The cost for excavating each pond is RM1,000. However, at the end of week 3 he has completed only 2 ponds and spent RM4,000.
- (i) Analyse the schedule variance (SV) and cost variance (CV) for Mr Jaafar's project.
(8 marks)
- (ii) Sketch a graphical representation of the various S-curves for the above project based on week 3 analysis.
(8 marks)
- (ii) Analyse the performance of Mr Jaafar's project in terms of the Cost Performance Index (CPI) and the Schedule Performance Index (SPI).
(4 marks)
- (b) You are the Project Manager for a Single Bungalow Housing Development Project on a hillslope scheduled to be fast tracked and completed in 25 weeks. You are initially required to prepare a Workbreakdown Structure (WBS) for discussion with the Local Authority Engineering Department in order to coordinate specialist contractor work to stabilize the hillslope prior to construction work taking place. Additionally, you are required to provide baseline (original) master programme and progress of work as of 20th week according to conditions stated below.

- (i) Sketch the complete Workbreakdown Structures (WBS) of maximum 6 levels of main tasks (total of 24 main tasks, including that of the installation of precast wall panels) with the main hillslope stability works broken down into 4 sub-tasks. (8 marks)
- (ii) Sketch the baseline master programme Gantt Chart based on the WBS prepared in Q4 (b)(i). (6 marks)
- (iii) Sketch the updated (revised) master programme Gantt Chart to indicate progress of work for 20th week that is on schedule for all activities except precast wall panel (one of the original tasks, which is delayed by 2 weeks) and solar roof panel installation (delayed by 1 week). (6 marks)

- END OF QUESTIONS -

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