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Universiti Tun Hussein Onn Malaysia

**UNIVERSITI TUN HUSSEIN ONN MALAYSIA**

**FINAL EXAMINATION  
SEMESTER I  
SESSION 2019/2020**

COURSE NAME : CONSTRUCTION PLANNING AND SCHEDULING  
COURSE CODE : BFP40103  
PROGRAMME CODE : BFF  
EXAMINATION DATE : DECEMBER 2019 / JANUARY 2020  
DURATION : 3 HOURS  
INSTRUCTION : ANSWER ALL QUESTIONS

THIS QUESTION PAPER CONSISTS OF SIX (6) PAGES

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- Q1** (a) Provide definition for terms used in a project management below:
- (i) Project Planning
  - (ii) Project Scheduling
  - (iii) Concept of Management
  - (iv) Procurement
- (8 marks)
- (b) Discuss the responsibilities of each parties below in preparing a good project planning and scheduling for a construction project:
- (i) Owner
  - (ii) Designer
  - (iii) Contractor
- (9 marks)
- (c) Explain **TWO (2)** importance of Work Breakdown Structures (WBS).
- (4 marks)
- (d) List **FOUR (4)** sources of information that can help the project managers in developing a Work Breakdown Structure (WBS)
- (4 marks)
- Q2** (a) PERT uses a probabilistic approach, which requires a duration frequency distribution for each activity. According to **Table 1**, calculate the expected duration ( $T_E$ ) and the standard deviation ( $\sigma_E$ ) of the path ABCDE. Develop a table to show the expected duration ( $T_e$ ), standard deviation ( $\sigma_e$ ) and variance ( $\sigma_e^2$ ) for each activities.
- (5 marks)
- (b) You are the Project Manager of an infrastructure project and are creating a network diagram. Activity A (3 days) and Activity B (6 days) can start immediately. Activity C (2 days) can start after Activity A is complete. Activity D (1 day) and Activity F (2 days) can start after Activity B is complete. Activity E (4 days) can start after Activity C and Activity D are complete. Activity G (5 days) can start after Activity D and Activity F are complete. When Activity E and Activity G are complete, the project is finish.
- (i) Determine the critical path
- (2 marks)
- (ii) Determine the latest date that the project supposed to complete if it is started on the 1<sup>st</sup> January 2020 (assume the activities will be executed for 7 days a week).
- (8 marks)

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- (c) You and your project management team are developing the schedule for a new project. The team has determined that Task A takes 3 days. Task B is dependent upon Task A finishing and has a duration of 4 days. Task C takes 5 days. Task D is dependent upon Task C starting and has a duration of 7 days. Task E is dependent upon both Task C and Task D finishing and has a duration of 3 days. Task F is dependent upon both Task E and Task B finishing and has a duration of 6 days. Calculate the duration of the project.

(10 marks)

- Q3** (a) The activity and durations in **Table 2** show the time-cost information for a portion of work package that need to be done in a school project. The main contractor requires you to complete the package between 10 to 15 days. Develop crashing program for the project and evaluate the effect in total project cost. Decide the best option in your crashing program.

(10 marks)

- (b) You are compiling a monthly summary for your Project Management Office (PMO) reports. There are 4 projects reporting the following data: Project A has an EV of \$500 and an AC of \$505; Project B has a CPI of 1.08, Project C has an EV of \$455 and an AC of \$450; and Project D has a CPI of 0.98. Determine which project is the most cost efficient. Provide justification to support your decision.

(10 marks)

- (c) Delay in construction project can be overcome by applying fast tracking approach. With an example, explain on how this concept can be applied in a housing project.

(3 marks)

- (d) Explain **TWO (2)** things that should be considered before a project manager can apply fast tracking approach.

(2 marks)

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- Q4** (a) Your company is assigned by the main contractor to complete activities listed in **Table 3**. The maximum workers that can work for each day is only six (6) labours.
- (i) Develop a CPM using an Arrow Diagram Method (ADM) (6 marks)
- (ii) Level the resources manually by satisfying the preceding activity to complying with the maximum number of resources available. (8 marks)
- (b) Construct a schedule for a 8-kilometre road-resurfacing project using Linear Scheduling Method (LSM) for activities given in **Table 4**. (11 marks)

– END OF QUESTIONS –

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**TABLE 1**

Activity ID	Predecessor	Duration (Days)		
		Optimistic	Most Likely	Pessimistic
A	-	2	4	6
B	A	3	5	10
C	B	2	3	5
D	C	4	6	8
E	D	1	3	5

**TABLE 2**

Activity	Predecessor	Normal		Crash	
		Duration (day)	Cost (RM)	Duration (day)	Cost (RM)
A	-	12	10,000	10	12,000
B	A	2	2,800	1	3,000
C	A	4	12,000	3	17,000
D	C	3	2,400	2	3,000
E	B,D	5	4,600	4	5,800

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## PEPERIKSAAN AKHIR

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TABLE 3

Activity	Duration (days)	Predecessor	Labours
A	3	-	2
B	4	-	3
C	3	A	3
D	4	A,B	5
E	3	B	4
F	4	D,E	3
G	3	C,D	2
H	2	F,G	3

TABLE 4

Activity	Daily Production (Linear Meter)
A. Miling	3,400
B. Base Course	2,400
C. Wearing Course	1,200
D. Road Furniture and Marking	1,000

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