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Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

**FINAL EXAMINATION
(ONLINE)
SEMESTER II
SESSION 2020/2021**

COURSE NAME : SUSTAINABLE CONSTRUCTION
MANAGEMENT

COURSE CODE : BFC32703

PROGRAMME CODE : BFF

EXAMINATION DATE : JULY 2021

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) Buildings are responsible for 40% of the world's global greenhouse gas emissions, using 12% of the world's potable water and utilizes 1/3 of the world's resources. Give your opinion on the importance of green building construction based on sustainable development goals established by the United Nation. (5 marks)
- (b) The concept of sustainable construction governs three main pillars which are environmental protection, social well-being and economic prosperity. You have been appointed as a project manager of a mixed development consisting of 3 blocks of 12 storeys apartment, 40 units of double-storey bungalows and 20 units of double-storey shophouses in a 350 acres size of land near Semenyih, Selangor. Relate the appropriate strategies that could be incorporated into this project with the concept of sustainable construction. (6 marks)
- (c) You have been invited as a guest speaker at the International Sustainability Forum 2021 at The United Nations Headquarters, New York. Your effort and contributions to the sustainable development policy here in Malaysia have been recognised by the most prestigious organization. Draft the content of your speech for that event by highlighting the principles of sustainable development and their application in our construction industry. (14 marks)
- Q2** Information and communication technologies (ICT) has brought numerous innovative success in the construction industry. This has led to an increase in productivity in construction industry.
- (a) Explain the importance of ICT in Malaysian construction industry. (8 marks)
- (b) Discover the obstacles for implementation of ICT in current construction industry scenario. (5 marks)
- (c) With the aid of a diagram, explain how ICT can facilitate in managing the technology information among the involved construction project members. (12 marks)

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- Q3** (a) Develop activity-on-node diagram for the information given in **Table Q3**, by also providing the earliest and latest start and finish for each activity and the critical paths. Then, construct Gantt chart to demonstrate the project schedule. (21 marks)
- (b) Justify how the Gantt Chart could assist the execution and the completion of construction project activities. (4 marks)
- Q4** (a) Quality Management is defined as coordinated activities to direct and control an organisation with regard to quality. It is also a useful management control tool in achieving the acceptable standard and work productivity in construction management. Based on the definition, explain **TWO (2)** of the Total Quality Management (TQM) principles that benefits the construction organization in Malaysia. (4 marks)
- (b) As a project engineer, you have been assigned to monitor and re-schedule all necessary construction activities that affected by Covid-19 Pandemic situation. Due to certain restrictions and the standard operating procedure (SOP) enforced by local authority, the maximum allowable number of workers at the construction site is 15 workers per day. Therefore, you have to manage the resources to make sure the relevant construction activities can be completed within allocated budget using resource levelling technique. The details of the construction's activities, duration and the number of workers are shown in **Table Q4**.
- (i) Construct a network diagram using Precedence Diagram Method (PDM) to determine the construction activities total duration. (8 marks)
- (ii) Show the critical activities in the construction activities network. (1 marks)
- (iii) Based on the self-developed PDM network diagram and Gantt chart, construct a resource histogram to determine the resources distribution. (6 marks)
- (iv) Perform and demonstrate a resource levelling to optimise the available resources. (6 marks)

–END OF QUESTIONS–

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TABLE Q3

Activity	Duration (days)	Predecessor
A	1	-
B	4	A
C	4	A
D	3	B
E	5	C
F	6	C
G	4	D
H	2	E
I	4	G
J	5	G
K	3	H,F
L	2	I
M	4	J
N	2	K,M
O	3	L,M
P	4	N,O

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TABLE Q4

Activity	Duration (days)	Predecessor	Relationship	Workers/day
A	3	-	Finish to Start	5
B	4	A	Finish to Start	8
C	3	A,B	Finish to Start	7
D	6	B	Finish to Start	8
E	3	B	Finish to Start	6
F	2	E	Finish to Start	6
G	2	D, F	Finish to Start	5
H	1	F	Finish to Start	5

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