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UNIVERSITI TUN HUSSEIN ONN MALAYSIA

**FINAL EXAMINATION
SEMESTER II
SESSION 2015/2016**

COURSE NAME : SUSTAINABLE CONSTRUCTION
MANAGEMENT

COURSE CODE : BFC 32703

PROGRAMME : BFF
CODE

EXAMINATION : JUNE/JULY 2016
DATE

DURATION : 3 HOURS

INSTRUCTIONS : A) ANSWER ALL QUESTIONS
B) WRITE DOWN YOUR ANSWERS
IN THE ANSWER BOOKLET
C) ATTACH ALL YOUR ANSWERS IN
GRAPH PAPERS TO THE ANSWER
BOOKLET

THIS QUESTION PAPER CONSISTS OF TWELVE (12) PAGES

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SECTION A (15 marks)

Each questions is given **ONE (1) mark** except question **Q12** which is **THREE (3) marks**.

Instruction:

Select **ONE** most appropriate answer for the following questions and write your answers in the answer booklet.

- Q1. Sustainable procurement is to ensure best value for money and to lower operational costs whilst protecting the environment and bringing wider societal benefits. This strategy can be achieved through procurement process which involved several processes. Which of the following is not the process of sustainable procurement?
- A. Tender specifications
 - B. Pre-qualifications
 - C. Material selection
 - D. Award stage
- Q2. Diamond Building (see **Figure Q2**), well known as a low energy building, is one of prominent sustainable buildings in Malaysia. Which of the following aspects of sustainable building design is applied for the building fabric in reducing building energy consumption?
- A. Reduction in fossil fuels
 - B. Indoor environmental quality
 - C. Construction and demolition management plan
 - D. Sustainable building materials
- Q3. What is the first need stated in Maslow's hierarchy of needs?
- A. Safety and Shelter
 - B. Physical comfort
 - C. Social
 - D. Acceptance

- Q4. You are a project manager leading a cross-functional project. None of your project team members report to you functionally and you do not hold the power to directly reward their performance. The task is difficult, involving tight date constraints and challenging quality standards. Which of the following type of organization would you be in this situation?
- A. Pure project
 - B. Functional
 - C. Matrix
 - D. Operations
- Q5. Industrialised Building System (IBS) concept has the potential to promote sustainability development and green construction. The followings are the efforts that can be achieved to improve project efficiency and deliverables from IBS adoption **EXCEPT**;
- A. A controlled production environment
 - B. Minimisation of construction waste
 - C. Extensive usage of high embodied energy building material
 - D. A safer and more stable work environment
- Q6. The following characteristics refer to a project delivery method;
- i. single point responsibility
 - ii. reduce the delivery schedule
 - iii. the firm will be responsible for both design and construction method
 - iv. the dominant contractor will overrule the designer's recommendations of quality workmanship

Which one of the project delivery method below matches well with the above characteristics?

- A. Traditional method
- B. Construction Management
- C. Design and Build
- D. Build Operate and Transfer (BOT)

- Q7. The construction industry is one of the most information-intensive industries, as a major construction process requires extensive exchange of data and information between the project's participants. The followings are the potential benefits of information and communication technology (ICT) in construction industry **EXCEPT**;
- A. Geographical differences to border less.
 - B. Virtual offices.
 - C. Reduction time for data processing and communication of information.
 - D. Increase of organization spending.
- Q8. **Figure Q8** shows a logic network for Precedence Diagram Method (PDM) for a project in Parit Raja. Which of the following is the correct logic for the illustrated network?
- A. B cannot begin until A begins.
 - B. A does not begin until B is completed.
 - C. B cannot finish until after A has begun.
 - D. A and B can begin concurrently, but B cannot be completed until after A is completed.
- Q9. Which of the following statements is meant for quality in completion of a construction project?
- A. To complete the project using the best quality materials
 - B. To construct in accordance to client requirements but maintaining original contract value
 - C. To make sure minor changes without client instruction as long as it is resulted in good quality of works.
 - D. To comply with the quality requirements as stipulated in the contract document.
- Q10. A project is facing a major change to its project deliverables. If the project manager is involved in determining which quality standards are relevant to the change, the project manager must be involved in:
- A. Control Quality
 - B. Quality Management.
 - C. Performance Quality Assurance.
 - D. Plan Quality Management.

Q11. You are in the planning process of a RM1 billion worth project. You realize that your schedule requires more resources in certain months of the project than that are available to you. Your Project Director has clearly instructed that you will not be able to obtain any additional resources for the project. Therefore, you are required to adjust the schedule to fit these constraints. In this situation, which scheduling technique is appropriate to be applied?

- A. Crashing
- B. Fast tracking
- C. Resource leveling
- D. Programme Evaluation and Review Technique

Questions Q12 and Q13 are to be referred to the diagram (see **Figure Q12**).

Q12. What is the duration to complete all the activities in the network diagram?

- A. 30 days
- B. 34 days
- C. 36 days
- D. 38 days

(3 marks)

Q13. Identify the critical path of the schedule.

- i. A-B-D-H-J
 - ii. A-B-E-H-J
 - iii. A-C-E-H-J
 - iv. A-C-F-G-J
-
- A. i only
 - B. i and ii
 - C. ii and iii
 - D. All the above

SECTION B (35 marks)**Instruction:****Answer all questions**

- Q1 (a) Enhancing public perception of the Malaysian construction industry is one of major concerns addressed in the Construction Industry Transformation Plan (CITP). Based on your understanding on sustainable construction, explain **TWO (2)** initiatives by the contractor to improve the image of the industry. (4 marks)
- (b) Planning, organizing, staffing, controlling and directing are key management functions in organizational approach. Organizing can be defined as “arrangement of resources in a systematic manner to fit the project plan”. You are appointed as project manager for a residential project in Penang. The construction area of around 240,000 square metres with the construction period of 16 months. The basic project process includes land acquisition, project planning, bidding and tendering, project implementation, completion, and delivery. As the project manager, explain on how you can apply “organizing” function for the project. (5 marks)
- (c) Explain on how “constructability” can be used as a strategy to achieve sustainable construction. (5 marks)
- Q2. The construction activities of a small framed building are indicated in **Table Q2**.
- Based on the Table Q2;
- (a) Construct an Activity on Arrow (AOA) diagram for the project. (4 marks)
- (b) Calculate the Early Start (ES), Early Finish (EF), Late Start (LS), and Late Finish (LF) for each activity. (6 marks)
- (c) Identify the critical path for the network.

(1 mark)

- (d) Construct a Gantt Chart of the project based on the data obtained (use ES and EF time) from Q2(b).

(4 marks)

- (e) Construct a physical S-Curve for the project based on the data obtained from Q2 (d).

(1 mark)

- Q3 Develop a resources histogram that shows resources requirements for early start schedule for all activities based on the information given in **Table Q3**.

(5 marks)

-END OF QUESTIONS-

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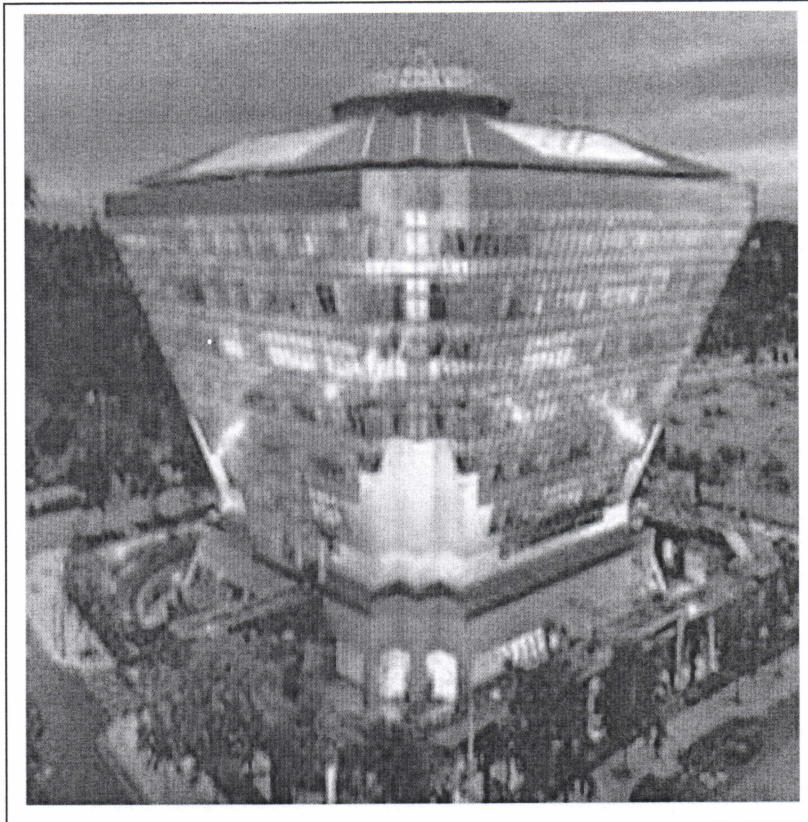


Figure Q2(c)

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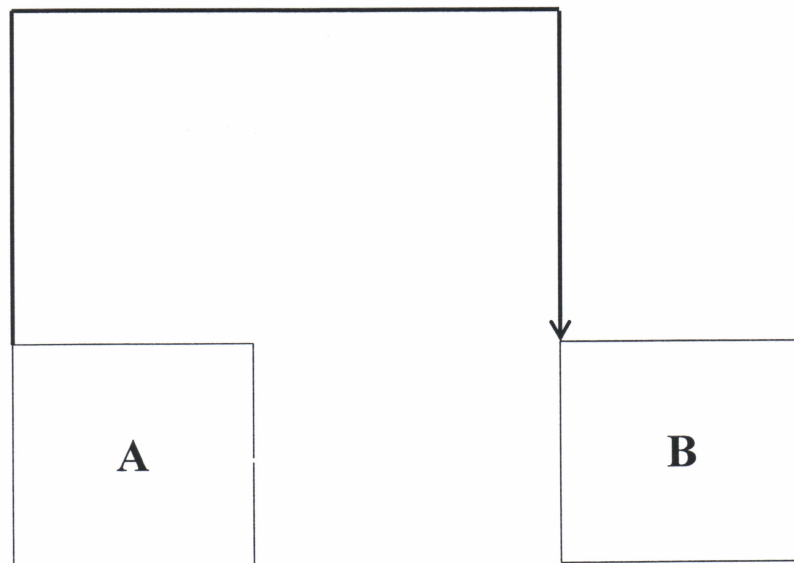


Figure Q8

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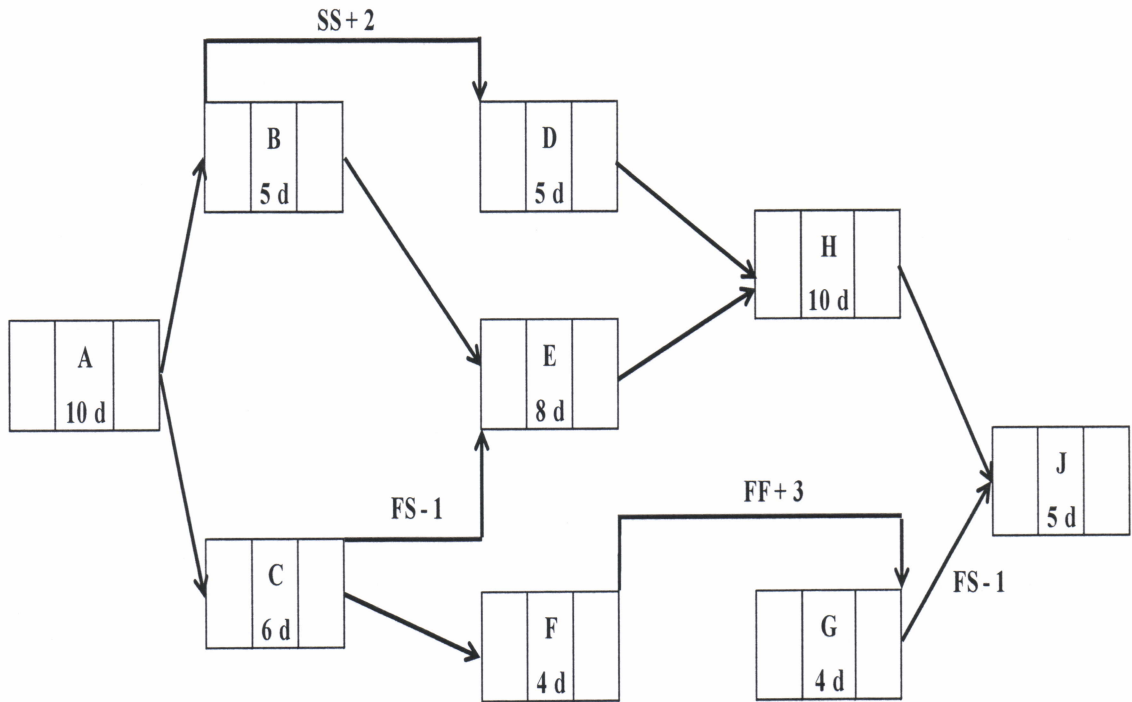


Figure Q12

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Table Q2

Activity	Activity Description	Duration (Days)	Predecessor
A	Excavation	3	Start of Project
B	Footings	2	A
C	Frame	4	B
D	Roof	3	C
E	Walls & Cladding	5	B
F	Drainage & Utilities	6	A
G	Floor Slab	3	E,F
H	Doors & Windows	4	F
I	Electrical	4	H
J	Plumbing	3	D,G
K	Final Inspection	1	J,I

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Table Q3

Activity	Activity Description	Earliest Start (ES)	Duration (Days)	General Operatives Required
A	Excavate Foundation	0	2	3
B	Excavate Drainage	2	6	2
C	Concrete Foundation	2	6	5
D	Pipework under building	8	3	3
E	External Piperwork	8	2	2
F	Backfilling to Floor	11	3	3
G	Floor Finishes	14	1	4