



UNIVERSITI KUALA LUMPUR
MALAYSIAN INSTITUTE OF MARINE ENGINEERING TECHNOLOGY

FINAL EXAMINATION
JANUARY 2017 SEMESTER

COURSE CODE : LGB42003

COURSE NAME : SHIPYARD & ENGINEERING PROJECT
MANAGEMENT

PROGRAMME NAME : BACHELOR OF ENGINEERING TECHNOLOGY (HONS)
(FOR MPU: PROGRAMME LEVEL) IN NAVAL ARCHITECTURE & SHIPBUILDING

DATE : 12/07/2017 WED

TIME : 9.00 AM - 12.00 PM

DURATION : 3 HOURS

INSTRUCTIONS TO CANDIDATES

1. Please read **CAREFULLY** the instructions given in the question paper.
 2. This question paper has information printed on both sides.
 3. This question paper consists of **TWO (2)** sections; Section A and Section B. Answer **ALL** questions in Section A and **THREE (3)** questions from Section B.
 4. Please write yours answers on the answer booklet provided.
 5. Write your answers only in **BLACK** or **BLUE** ink.
 6. Answer all questions in English.
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THERE ARE 8 PAGES OF QUESTIONS, EXCLUDING THIS PAGE.

SECTION A (Total: 40 marks)

INSTRUCTION: Answer ALL questions
Please use the answer booklet provided.

Question 1

- a. There is a popular belief that construction sites are unsafe and the risks that workers face are usual. Accidents may cause physical injuries or health illness in the long term. The term hazard is defined as anything that can cause harm. Name two (2) of the most common hazards that are always present in a maritime work environment.

(5 marks)

- b. Hazards are categorized according to the nature of danger they pose. The two major categories of hazards usually found in construction sites are namely, physical injury hazard and health hazard. Briefly explain both of them.

(5 marks)

- c. Malaysian labor laws are enforced to help regulate employment issues, union activities, and relations between employers and workers. With less labor unrest, hence less downtimes, the labor laws of Malaysia should help benefit the industry in general by making it more competitive. Discuss a regulation with regards to "firing" under the Employment Act of 1955.

(10 marks)

Question 2

- a. Safe storage and proper handling of production materials in a shipyard are important to ensure smooth production work flows, production datelines are met and unnecessary work stoppages are avoided. This would help make the shipyard safer, more productive, and hence, more competitive. Briefly explain why metals of different galvanic ratings should be safely stored apart (away) from each other.

(10 marks)

- b. A project manager must decide on the most effective and efficient approach in getting the resources for his project. Hence, a proper resource scheduling would help ensure project datelines are met. Resources, such as materials and labor, required in the construction or repair of ships in a shipyard must be made available based on planned project datelines. This resource scheduling involves a few proven approaches. Comparing the three (3) most common approaches in acquiring material resources, namely, *manufacturing in-house*, *sub-contracting manufacture* and *purchasing*, discuss the most likely reasons of adopting any two (2) of the approaches in getting the resources or materials for a project.

(10 marks)

SECTION B (Total: 60%)

INSTRUCTION: Answer only THREE questions.
Please use the answer booklet provided.

Question 3

- a. A project manager in a shipyard is responsible for ensuring all specified routine maintenance or repair works on a ship are carried out as planned. A simple slipping process would involve up-slipping, underwater works or repairs on-board and followed by down-slipping on a slipway. Before down slipping (or launching), the project manager must ensure certain important final checks are carried out. Briefly explain five (5) important pre-down slipping preparations that a project manager must be responsible for.

(5 marks)

- b. Production layouts in a shipyard should conform to the nature of production process employed. The most common layouts, namely, *fixed position layout*, *product layout*, *process layout* and *group technology layout* are found in most shipyards. Briefly discuss and sketch all four (4) of the *layouts* above and indicate the most appropriate choice of layout suitable for a modular construction approach in shipbuilding.

(10 marks)

- c. A shipyard that neglects issues on work safety, materials management, effectiveness of production processes, suitability of production layout and suitability of shipyard location would ultimately find itself being displaced from the lucrative and competitive maritime industry. Looking at the issue on suitability of shipyard location, develop five (5) important criteria in determining the most suitable location for a shipyard.

(5 marks)

Question 4

- a. Two most important elements of project management is project planning and monitoring. An improperly planned project may result in subsequent tracking problems, inability to compare actual with planned outcome, inaccuracy in analyzing impact and adjustment problems. A project planner is definitely a key player in the project manager's organization. Applying your knowledge in project planning briefly discuss five (5) important project planner's roles.

(5 marks)

- b. After a ship has been docked in a shipyard, some preparation works must be done by project manager before actual works can start. Briefly discuss five (5) pre-work preparations to ensure a smooth work flow

(5 marks)

- c. The slipway, or an inclined launch way, is the most common docking facility available in a small boat yard. For repair works, a boat is up-slipped on the slipway and on completion, down-slipped using a winch-operated cradle. For a new-built construction, down-slipping on a slipway may be either using the air-bags method or using the winch-operated cradle. Generally, one of two (2) methods is employed when down-slipping a boat on a slipway, either using the *end-launching* or *side launching* approach. Discuss the side launching approach.

(5 marks)

- d. Some of the typical ship handling facilities available in large shipyards are namely, graving dock, synchro-lift and floating dock. They are used for docking and undocking of large ships. Briefly explain with a sketch one (1) of the above ship handling facility found in a large shipyard.

(5 marks)

Question 5

- a. The Critical Path (CP) of a project is the sequence of tasks that form the longest chain in terms of their duration time to complete. If any one of the activities in the CP is delayed, then the entire project would be affected or delayed. A zero slack indicates zero allowance for delay. Briefly describe five (5) approaches how you can effectively reduce the total project duration time (although this may increase cost).

(5 marks)

- b. Project planning helps determine the Critical Path of a project. Effective management of a complex project requires a systematic project planning approach. That approach is called the Critical Path Method (CPM). Using the CPM manually fill up Table 1 below;

- i. Evaluate all E_s , E_f , L_s , L_f , Slack, CP and duration of CP (on separate answer sheet).
- ii. Manually develop a network diagram (on separate answer sheet) showing all the task activities and the Critical Path of the project.

(5 marks)

Table 1: Task Information

Task	Immediate Predecessor	Duration (days)	E_s	E_f	L_s	L_f	Slack	CP
A	-	6						
B	A	7						
C	A	8						
D	A	7						
E	A	5						
F	D	6						
G	E	7						
H	B,C	8						
I	B,C	7						
J	B,C	7						
K	F,G	10						
L	H,J	9						

(use the following conditions as your guide)

$$E_f = E_s + \text{activity time}$$

$$E_s = E_f - \text{activity time}$$

$L_f =$ smallest L_s of immediate successor (or, for last node, the highest E_f of last node)

$$L_s = L_f - \text{activity time}$$

$$\text{Slack} = L_f - E_f$$

$$E_s = \text{highest } E_f \text{ predecessor}$$

Question 6

- a. A project manager may encounter situations where duration times for project tasks are uncertain. This uncertainty may require a mathematical approach to determine the mean times for each task. Briefly explain, using a formula, how the mean time of an uncertain task duration is derived.

(5 marks)

- b. Fill up table 2 by evaluating the mean time (t_i), variance, E_s , E_f , L_s , L_f , Slack, duration of Critical Path (CP) and determine the CP (all data to be shown on a separate answer sheet).

(10 marks)

Table 2: Task Information

Activity	Immediate predecessor	a_i	m_i	b_i	t_i	variance	E_s	E_f	L_s	L_f	Slack	CP
A	-	8	10	12								
B	-	5	4	8								
C	-	7	9	13								
D	B	5	7	9								
E	B	6	8	10								
F	D	6	8	10								
G	A,C	4	5	6								
H	A,C	4	6	7								
I	G,H	5	7	11								
J	E,F	6	8	10								
K	G,H	7	8	9								

- c. The S-Curve is an important project management tool. It is used by management to assess the expected infrastructural cost loading over the duration of project. Develop a simple cumulative cost versus time S-Curve and briefly discuss the importance of S-Curve in project management.

(5 marks)

END OF QUESTION