



UNIVERSITI KUALA LUMPUR
Malaysian Institute of Marine Engineering Technology

FINAL EXAMINATION
JANUARY 2016 SESSION

COURSE CODE : LGB 42003
COURSE NAME : SHIPYARD AND ENGINEERING PROJECT MANAGEMENT
PROGRAMME NAME : BACHELOR OF NAVAL ARCHITECTURE AND SHIPBUILDING
DATE : 18 MAY 2016
TIME : 08:00 AM - 11:00 AM
DURATION : 3 HOURS

INSTRUCTIONS TO CANDIDATES

1. Please read the instructions given in the question paper CAREFULLY.
 2. This question paper has information printed on both sides of the paper.
 3. This question paper consists of TWO (2) sections: Section A and Section B.
 4. Answer ALL questions in Section A. For Section B, answer THREE (3) questions only.
 5. Answer all questions in English language only.
 6. Please write your answers on the answer booklet provided.
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THERE ARE 9 PAGES OF QUESTIONS, INCLUDING THIS PAGE.

SECTION A (Total: 40 marks)

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

Question 1

a. Controlling of hazards or risks in the work place, such as a work shop, requires a few steps namely, elimination, substitution, engineering controls and administrative controls. There are hazards that can neither be eliminated nor substituted but may be made safer by introducing certain engineering control methods or equipment to reduce danger. List down five (5) such methods that can be used to reduce danger.

(10 marks)

b. Malaysian labor laws should help regulate employment issues, union activities, and employer/employee relations. Labor unrest due to irregularities in adhering to the rules and regulations by both employers and employees may ultimately result in unnecessary loss of productivity due to downtimes. As such compliance with the labor laws of Malaysia would help benefit the industry by making it more productive, hence more competitive. Discuss a regulation with regards to "firing" under the Employment Act of 1955.

(10 marks)

Question 2

a. Improper storage and handling of production materials for construction or repair activities in a shipyard may result in a gradual deterioration or damage to the materials, hence affecting the smooth work flow and production planning that may result in unnecessary work stoppages or down times. Materials of different galvanic ratings exhibit certain characteristics when placed together in a maritime or salty environment. Briefly explain this galvanic corrosion phenomena and relate this to how you may effectively store different materials in a shipyard in order to avoid material deterioration and subsequent production losses.

(10 marks)

b. A project manager must plan for the most cost effective and efficient approach in getting the resources for his project. This plan is called resource scheduling and is an important activity that helps a project in meeting the datelines as set by the project planner. Resources, such as materials and labor that are required in the construction or repair of ships in a shipyard, must be made available based on planned project datelines. This resource scheduling usually involves a few proven approaches. Examining the three (3) most common approaches in acquiring resources, namely, *manufacturing in-house*, *sub-contracting manufacture* and *purchasing*, discuss the justifications of adopting the *sub-contracting manufacture* and *purchasing* approach in getting the resources for a project.

(10 marks)

SECTION B (Total: 60%)

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

Question 3

a. The tasks of a ship repair project manager is a tedious one. He has to ensure whether a ship entering a shipyard for repairs had undergone prior pre-docking preparations at ship owner's premise, whether the shipyard itself has carried out pre-docking preparations prior to receiving the ship at its premise, whether the shipyard has carried out the necessary pre-works preparation soon after docking, and whether the shipyard has carried out pre-launching or down-slipping preparations on completion of works. All the preparations are part of a project management process undertaken by the project manager. To ensure a smooth work-flow briefly explain five (5) important pre-works preparation soon after docking.

(5 marks)

b. The lean concept in ship building focusses on minimizing of waste, both material and labor through using of improved technology, improved material and efficient processes. A shipyard manager thus must strive for a smooth production process in the shipyard. As such, a most suitable shop floor production layout should be in place that conforms to the nature of production process chosen. Among the most common layouts as found in many modern shipyards are namely, *fixed position layout*, *product layout*, *process layout* and *group technology layout*. Considering the layouts given briefly sketch and evaluate the layout most suitable for a modular construction approach that focuses on the lean concept in shipbuilding.

(10 marks)

c. An existing shipyard may encounter certain problems that would affect its work safety, effectiveness in managing materials and efficiency of its shop floor production processes. These problems would require special management intervention such as by using of SWOT and TOWS matrix analysis to manage the problems arising and help derive improvement plans for the shipyard. Looking at typical improvement plans on making the shipyard's shop floor production processes more efficient develop five (5) important benefits that can be derived from these improvement plans.

(5 marks)

Question 4

a. Project management is basically the *planning, organizing, leading and controlling or monitoring* of a project. 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, thus, plays a key role in the project manager's organization. Briefly explain five (5) important project planner's roles.

(5 marks)

b. On completion of repair works in the shipyard and before launching/down-slipping appropriate checks must be made by project manager. These checks are to ensure water-tight integrity of underwater hull, valves, piping and general ship's safety are met. Briefly discuss five (5) important pre-launch preparations by project manager on completion of works.

(5 marks)

c. The slipway, or an inclined launch way, is the most common docking facility available in a small boat yard. A boat is up-slipped and down-slipped using a 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. Briefly discuss with an appropriate sketch *either one* of the two launching approaches.

(10 marks)

Question 5

a. Project planning is a complex process that uses Microsoft Project software to derive the Critical Path (CP) of a project. The CP can also be derived using the manual approach. This CP reflects the criticality of the tasks involved. It is the sequence of tasks that constitute the longest duration time or the total project duration time for a project to complete. If any one of the task or activity in the CP is delayed, then the entire project would be affected or delayed, while a new CP may emerge. A CP has zero slack. Zero slack indicates zero allowance for delay. Briefly describe five (5) approaches how you can effectively reduce the total project duration time.

(5 marks)

b. Project planning helps determine the duration of a project as reflected by the Critical Path along which activities are carried out and cannot be delayed. Effective management of a complex project requires a systematic project planning approach. That approach is called the Critical Path Method (CPM).

- i. Manually develop a network diagram (on a separate answer sheet) based on the task information at Table 1, showing all the task activities. Using the forward and backward passes, evaluate all the activities and show clearly on the diagram. (If there are more than one CP, what is the longest path and its duration?).

(5 marks)

- ii. Having evaluated all E_s , E_f , L_s , L_f , Slack, CP and duration of CP on the network diagram, manually fill up Table 1 below (on a separate answer sheet).

(10 marks)

Table 1: Task Information

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

(use the following rules as your guide)

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

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

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

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

$\text{Slack} = L_f - E_f$

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

Question 6

a. Program Evaluation Review Technique (PERT) is a form of project planning similar to Critical Path Method (CPM) but takes on a slightly different approach. 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. Referring to task information at Table 2, develop the network diagram. Calculate the mean time (t_f), E_s , E_f , L_s , L_f , Slack, Critical Path (CP) and duration of CP. Fill up Table 2 and show all data on network diagram (network diagram and 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	E_s	E_f	L_s	L_f	Slack	CP
A	-	5	7	8							
B	-	4	6	7							
C	-	5	5	5							
D	A	3	4	6							
E	A	4	5	7							
F	B,C	6	7	9							
G	B,C	4	6	8							
H	D,E	5	7	9							
I	F,G	2	2	2							

(use the following rules as your guide)

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

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

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

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

$\text{Slack} = L_f - E_f$

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

c. The S-Curve is an important project management tool. It is used by management to assess the infrastructural cost loading over the expected duration of a 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