



UNIVERSITI KUALA LUMPUR
MALAYSIAN INSTITUTE OF MARINE ENGINEERING TECHNOLOGY

FINAL EXAMINATION
SEPTEMBER 2016 SEMESTER

COURSE CODE : LEB 30203

COURSE NAME : ELECTRONIC COMMUNICATION 2

PROGRAMME NAME : BACHELOR OF MARINE ELECTRICAL ELECTRONIC
(FOR MPU: PROGRAMME LEVEL)

DATE : 19TH JANUARY 2017

TIME : 2.00PM

DURATION : 3 HOURS

INSTRUCTIONS TO CANDIDATES

1. Please **CAREFULLY** read the instructions given in the question paper.
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 **WITH AT LEAST ONE (1)** question from question 4 or question 5.
5. Please write your answers on the answer booklet provided.
6. Answer all questions in English language **ONLY**.

THERE ARE 6 PAGES OF QUESTIONS, INCLUDING THIS PAGE.

SECTION A (Total: 40 marks)

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

Question 1

(a) Explain the difference of serial data transmission with parallel data transmission in term of their clock connections and output efficiency .(CLO 1)

(4 marks)

(b) Figure 1 shows a design of a network topology in local area network. Describe the advantages of the network in terms of expanding the number of host, signal transmission and cost efficiency. (CLO 1)

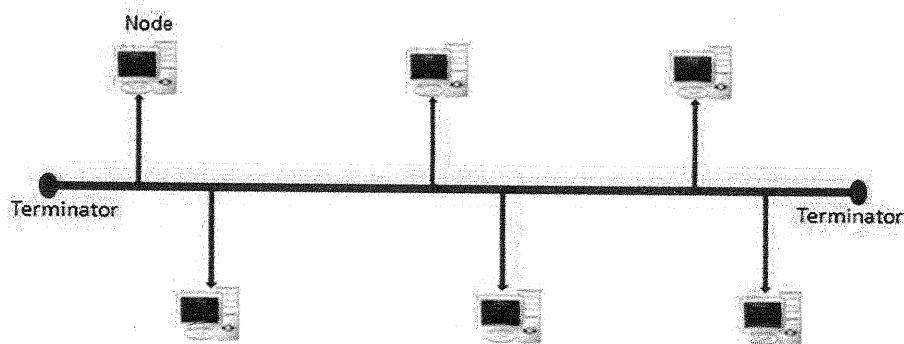


Figure 1

(4 marks)

(c) Ethernet is the most popular method to organize networks. Based on IEEE 802.3 standard, explain the characteristic of Ethernet. (CLO 1)

(4 marks)

(d) Briefly explain the term 'collision' in a network. Thus, describe on how it happens when a collision occurs on an Ethernet network segment. (CLO1)

(4 marks)

- (e) Main device to control a server is called 'hub'. Describe the operations of a hub in a network.
(CLO1)

(4 marks)

Question 2

- (a) Sketch the orbit that followed by the satellite. Provide the distance range for each orbit. (CLO2).
(4 marks)

- (b) A satellite system consists of a radio repeater in the sky called a transponder. Briefly explain the functions of the transponder that makes it useful for long-distance communication. (CLO2).
(4 marks)

- (c) The following two-line element set has been recently obtained for the satellite MAQSAT B.(CLO2)

1	2	5	0	2	4	1	9	7	0	6	6	8	0	3	0	6	5	5	8	8	3	7	8	2	5	-	1	0	0	0	0	1	6	4	0	0	0	0	0	-	0	-	5	2	9	7	3	-	3	0	6	9	9	1
2	2	5	0	2	4	1	7	8	1	1	6	4	8	6	9	6	5	6	3	1	5	0	3	0	1	6	1	5	7	5	3	2	4	2	6	3	8	2	3	0	8	7	3	3	9	6	9	6	0	3	3	3		

- (i) Calculate the semi major axis a of the satellite's orbit in kilometers.
(4 marks)
- (ii) Determine the apogee and perigee heights for the orbit. Assume a mean earth radius of 6371km.
(4 marks)
- (iii) Calculate the maximum and the minimum speed of the satellite.
(4 marks)

SECTION B (Total: 60 marks)**INSTRUCTION: Answer THREE (3) ONLY from FOUR (4) questions.****Please use the answer booklet provided****Question 3**

- (a) A satellite antenna is aimed by adjusting its azimuth (horizontal position) and elevation (vertical angle to the ground). In practice, tracking geostationary satellites requires that the azimuth and elevation be adjusted only once. For satellites antenna adjustment, determine the steps required. (CLO2)
- (4 marks)
- (b) Produce the standard equation for path loss which is applied to satellite communications in order to increase high gain and sensitive receiver. (CLO2)
- (4 marks)
- (c) Geostationary satellites represent the most important satellite types in use today. Geostationary satellites are adapted for use in television, radio broadcasting, telephony, and data communications. Discuss the television and radio broadcasting process by satellite system. (CLO2)
- (6 marks)
- (d) Telephony Transmission via satellite can be accomplished in a number of ways, using either analog or digital technology. Discuss the technology of frequency division multiplexing (FDM) which commonly used in frequency modulation. (CLO2)
- (6 marks)

Question 4

- (a) When a signal detected as emergency it is called as distress. Briefly describe basic concept of global maritime Distress and Safety System (GMDSS) in this manner.(CLO3)
(5 marks)
- (b) Describe all functional requirements that has the function of transmit Ship-to-Shore Distress Alerts and receive Shore-to-Ship Distress Alerts. (CLO3)
(5 marks)
- (c) Discuss all sea areas that covered by GMDSS that can emphasis the ability to alert SAR authorities and shipping to response to distress situations. (CLO3)
(5 marks)
- (d) Determine the carriage equipment requirements used in rescuing distress ships in all sea areas. (CLO3).
(5 marks)

Question 5

- (a) An optical fiber is essentially a waveguide for light which consists of a core and cladding that surrounds the core. State the term '*index of refraction*' in a fiber optic cable. (CLO3)
(2 marks)
- (b) Consider Light Emitting Diode (LED) and laser diode as the sources for fiber optic cable in transmitting signal data. Describe the advantages of using optical fiber. (CLO3)
(4 marks)

- (c) Describe the optical fiber construction that capable to transmit high speed data in communication system.

(6 marks)

- (d) Since optical fiber is a waveguide, light can propagate in a number of modes. Some modes will caused dispersions. Briefly explain the types of fiber optic and the dispersion caused during propagation in optical fiber system. (CLO3)

(8 marks)

Question 6 (CLO2)

- (a) A network is a communication system with two or more stations that can communicate with one another. There are four (4) basic types of network. List down all the networks. Hence, describe two (2) features of each network.

(4 marks)

- (b) Network topology is a physical schematic for the different configurations or arrangements to show the interconnection of the users. Explain THREE (3) main operation of each topology with suitable diagram.

(6 marks)

- (c) There is no single network topology that is ideal for all situations. The best choice depends on several factors. List three (3) factors which we should consider when choosing the best topology.

(6 marks)

- (d) Sketch the fiber optic system that cause losses from splices and connections that are not properly being done. Discuss each result from the losses.

(4 marks)

End of question paper.