

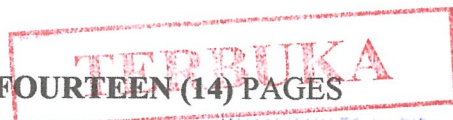


UNIVERSITI TUN HUSSEIN ONN MALAYSIA

**FINAL EXAMINATION
SEMESTER I
SESSION 2018/2019**

COURSE NAME : TELEMEDICINE
COURSE CODE : BEU 40803
PROGRAMME : BEJ
EXAMINATION DATE : DECEMBER 2018/JANUARY 2019
DURATION : 3 HOURS
INSTRUCTION : ANSWER ALL QUESTIONS
IN THIS QUESTION PAPER

THIS QUESTION PAPER CONSISTS OF **FOURTEEN (14) PAGES**



Q1 (a) Telemedicine can be defined using different terms which are telemedicine, telehealth and telecare.

(i) Differentiate between those three terms used for telemedicine.

(6 marks)

Solution:

(ii) Draw to illustrate the connection between all three terms in **Q1(a)**.

(3 marks)

Solution:

TERBUKA

- (b) There are four phases of telemedicine development based on utilising telecommunication and information technologies. State any **TWO (2)** development phases of telemedicine.

(2 marks)

Solution:

- (c) Telephone conversation is one of the simplest examples for both telemonitoring and teleconsultation. Explain on how telephone conversation can be used for telemonitoring and teleconsultation respectively.

(3 marks)

Solution:

- (d) Teleeducation is the use of telemedicine links to deliver medicine and healthcare oriented educational material. Propose a concept on how teleeducation plays its role to healthcare workers and public, respectively.

(4 marks)

Solution:

TERBUKA

- (e) Discuss any **TWO (2)** non-technological factors that drive the development of telemedicine.

(4 marks)

Solution:

- (f) Telemedicine may lead to organizational disruptions. In your own words, describe on how telemedicine can disrupt the organization.

(3 marks)

Solution:



- Q2 (a)** Figure Q2(a) shows a continuous time (CT) signal. Based on Figure Q2(a), obtain its discrete time (DT) signal if the sampling rate is 2 samples/second.

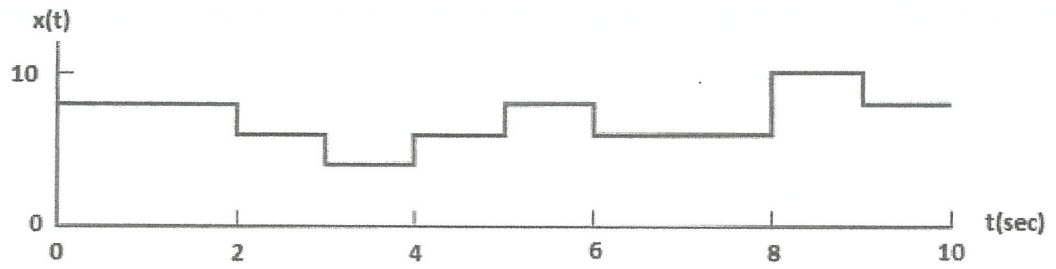


Figure Q2(a)

(5 marks)

Solution:

- (b) Differentiate between deterministic and stochastic signals in term of their;
- (i) definition.
 - (ii) example of the signal.

(4 marks)

Solution:

TERBUKA

- (c) There is a wide variety of classification methodologies that one may choose to apply, including artificial neural network (ANN) and Decision Tree.
 - (i) Evaluate **ONE (1)** main advantage of using Decision Tree as compared to ANNs.

(3 marks)

Solution:

- (ii) Design the decision tree classification method for the following situation:

It is indicated that the successful patients that underwent embryo plantation have more than one embryo transferred ($NUM_TRANS > 1$), have no additional hormonal stimulation ($NUM_STIM = 0$), are of age less than or equal to 40 ($AGE \leq 40$), and have no trauma during plantation of the embryos ($TRAUMA = 0$).

(Hint: You may use '0' for fail condition and '1' for successful condition)

(7 marks)

Solution:



(d) Total recorded number of medical cases in a clinic are as below:

Correct healthy estimation = 88

Correct illness estimation = 81

Illness estimation for a healthy case = 8

Healthy estimation for an ill case = 18

Assess the accuracy, sensitivity and specificity of the above cases.

(6 marks)

Solution:

Q3 (a) Body Area Network (BAN) is a technology that allows very tiny radio transmitting devices to be securely installed on a human body.

(i) Differentiate between **TWO (2)** major components of BAN.

(4 marks)

Solution:

(ii) Discuss any **TWO (2)** issues related to BAN system.

(4 marks)

Solution:

- (b) Telemedicine for healthcare can also facilitate the general public in maintaining good health in many activities, including swimming.
- (i) Summarize on how a system that allows small transceivers to be brought with a swimmer can potentially save lives.

(3 marks)

Solution:

- (ii) State **TWO (2)** issues that might arise when using underwater communication during swimming.

(2 marks)

Solution:

- (c) Irrespective of their legal systems, most democratic countries now base their modern practice of patient confidentiality on the three guidelines. Explain any **TWO (2)** of them.

(4 marks)

Solution:

- (d) The UK General Medical Council's (GMC) has declared guidelines to doctors in term of patient consent to disclosure of information. Based on the statements below, determine whether the statements is **TRUE** or **NOT TRUE**.

- (i) A doctor must respect requests by patients that information should not be disclosed to third parties, save in exceptional circumstances _____
- (ii) If a doctor disclose information, the doctor should releases only as much information as is necessary for the purpose. _____
- (iii) Doctors must make sure that health workers to whom they disclose information understand that it is given to them in confidence which they must respect. _____
- (iv) If a doctor decides to disclose confidential information, he/she does not have to explain and justify the decision. _____

(4 marks)

- (e) Elaborate the clinical and legal purpose of the consent, respectively.

(4 marks)

Solution:

Q4 (a) In line with Vision 2020, Malaysia's healthcare system is to be transformed.

- (i) State **FOUR (4)** characteristics of future healthcare systems according to Malaysia's Health Vision.

(4 marks)

Solution:

- (ii) Explain **TWO (2)** pilot applications for telemedicine development in Malaysia.

(4 marks)

Solution:

TERBUKA

- (iii) With the aid of an appropriate diagram, summarize on how Malaysia can transform from industrial age medicine to information age healthcare system.

(8 marks)

Solution:

(b) Electronic Health Records (EHRs) is an electronic record of health-related information on an individual that conforms to nationally recognized interoperability standards. It can be created, managed, and consulted by authorized clinicians and staff across more than one healthcare organization.

(i) List **THREE (3)** importances of EHR system.

(3 marks)

Solution:

(ii) Computerized Physician Order Entry (CPOE) is an EHR feature that processes orders for medications, lab tests, x-rays, consultations, and other diagnostics purposes. Explain **THREE (3)** advantages of adopting the CPOE system.

(6 marks)

Solution:

– END OF QUESTION –

TERBUKA