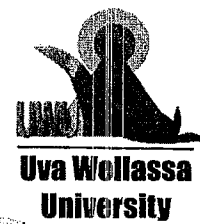


**Uva Wellassa University of Sri Lanka**  
**Faculty of Science and Technology**  
**Department of Computer Science and Technology**  
**200 level 1<sup>st</sup> Semester Examination – June/July 2017**  
**IIT 221-2 Computer Networks and Applications**



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**Instructions to candidates**

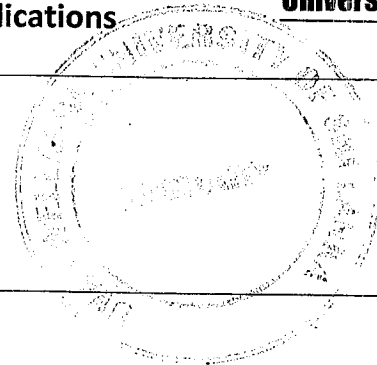
**Duration:** Two (02) Hours

**Number of questions:** Five (05) Essay Questions

**Answer four (04) questions only**

**Mark allocation:** 100

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1.
  - a. List and describe the components of data communication system. (5 mark)
  - b. Explain Forward Error Correction (FEC) and Backward Error Correction (BEC) using diagrams. (6 mark)
  - c. Briefly explain sliding window mechanism. (6 mark)
  - d. Describe 'Packet Switching'. (4 mark)
  - e. List two (02) guided media types and give two (02) characteristics for each. (4 mark)
  
2.
  - a. Name the ISO – OSI seven (07) layers in proper order and briefly explain the functionality of any three (03) layers. (8 mark)
  - b. Cyclic Redundancy Check (CRC) is one of the error detection mechanisms. If the data to be transmitted is 100100 and the divisor is 1101,
    - i. Show the Frame Check Sequence (FCS) is 001. (4 mark)
    - ii. What is the bit stream that is transmitted. (3 mark)
    - iii. If the received bit stream is 100100001, show that there are no errors in the received bit pattern. (6 mark)
  - c. Describe the term Round Trip Time (RTT). (4 mark)
  
3.
  - a. Briefly explain the client server architecture using a diagram. (4 mark)
  - b. We can classify computer networks in to different categories according to the scale. Name and describe these categories. (8 mark)
  - c. Briefly explain 'periodic signal'. (2 mark)
  - d. Name the parameters of a sine wave. (3 mark)
  - e. Compare and contrast Internet Protocol address version 4 (IPv4) with Internet Protocol address version 6 (IPv6). (6 mark)
  - f. What is meant by 'line configuration' of a network? (2 mark)

4.

- a. 172.20.50.30 / 19 IP address was assign to a device in a network.
- What is the class of the above IP address? (1 mark)
  - What is the Network address? (2 mark)
  - Write the subnet mask (net mask) of the above IP address. (2 mark)
  - How many subnets that you can build in the above network. (4 mark)
  - How many hosts (maximum number) could be connected to the above network? (4 mark)
- b. Briefly explain 'simplex transmission' mode with an example. (4 mark)
- c. XYZ is a well reputed bank in Uva province. It has following components.
- Three (03) floors in the building. (Floors are named as ground, first and second)
  - The server room is located in the first floor.
  - The Internet connection is terminated directly to the server room.
  - The Human Resources (HR) division with three (03) users and the accounts division with five (05) users is located in the ground floor.
  - Pawning center is located in the first floor with fifteen (15) users.
  - There are ten (10) computers in the administration division and the branch manager's office is located in the second floor.

The supplied resources are given below,

Cable boxes (CAT 5 cables), Crimping tools, RJ-45 jacks for the cables, three (03) units of 24 port switches, four (04) units of 12 port switches, two (02) units of 8 port switches, two (02) routers.

Draw the network diagram for XYZ bank using the information given above. (8 mark)

5. Write short notes on following.
- Star topology. (5 mark)
  - Unguided transmission media. (5 mark)
  - Network layer. (5 mark)
  - Router. (5 mark)
  - The Internet. (5 mark)