

**LOCATION: SWANSEA**

**LLEOLIAD: ABERTAWE**

**LEVEL 5**

**LEFEL 5**

**EXAMINATION PERIOD**  
**JANUARY 2019**

**CYFNOD ARHOLIADAU**  
**IONAWR 2019**

**MODULE CODE: ACCB5004**  
**Wireless Networks & Simulation**

**TIME: 2 HOURS**

**ANSWER FOUR QUESTIONS ONLY**

*Equipment or materials required – Calculators*

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## ANSWER FOUR QUESTIONS

### Q1.

- A. List the seven layers of the OSI Model. Explain what is the major function of any two layers? [5 marks]
- B. Explain the difference between basic service set (BSS) and independent BSS (IBSS). [5 marks]
- C. In your own words, briefly explain the fundamental difference between Carrier Sense Multiple Access/Collision Avoidance (CSMA/CA) and the Aloha access mechanism? [5 marks]
- D. Critically compare and contrast Wireless Mesh Networks (WMN) and Wireless Sensor Networks (WSN). [10 marks]

### Q2.

- A. Explain how Wireless LAN (WLANs) are different from wired networks (LANs). [5 marks]
- B. Name two Data Link layer standards and give an example of a protocol for each standard. [5 marks]
- C. Describe the IEEE 802.11 logical topologies (diagrams may be used to aid your answer). [5 marks]
- D. List two of the advantages and two disadvantages of Wireless ATM networks. [5 marks]
- E. What are the four common properties of electromagnetic waves? [5 marks]

**Q3.**

- A. Which transport layer protocol of the TCP/IP model is preferred when using live video streaming applications? Discuss its necessary properties in this context. [5 marks]
- B. The logical link control (LLC) is the upper sublayer of the Data link layer of the IOS, list the service LLC provides to the Upper Layer Protocols (ULP) and explain one of your choices. [5 marks]
- C. What is the basic unit of power? Write the formula used to calculate power. [5 marks]
- D. There are two main types of antenna, omni-directional and directional. With the aid of diagrams, explain the principles of both these antennas. [10 marks]

**Q4.**

- A. Suppose transmission channels become virtually error-free. Is the data link layer still needed? [5 marks]
- B. Discuss the three security goals supported by provided by the WPA2 in IEEE 802.11x? [5 marks]
- C. What is meant by the following terms: [5 marks]
- i. Bandwidth
  - ii. Refraction
  - iii. Multipath
  - iv. Absorption
- D. Briefly define what is the Long Term Evolution Protocol (LTE)? [5 marks]
- E. Compare the LTE and LTE advance using the following criteria: [5 marks]
- i. Bandwidth scalability
  - ii. Capacity

**Q5.**

A. What are the converged networks? Give two examples. [5 marks]

B. Explain what is meant by the signal refraction issue? [5 marks]

C. Suppose all laptops in a large city are to communicate using radio transmissions from a high antenna tower. Is the data link layer or network layer more appropriate for this situation? [5 marks]

D. For a Parabolic reflective antenna with diameter of 1.2m, operating at 12GHz. Calculate the following: [10 marks]

- i. Effective area.
- ii. The antenna gain in dB.

**Diwedd/End**