Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 10829

M.C.A. DEGREE EXAMINATIONS, APRIL/MAY 2023.

Elective

MC 4018 – WIRELESS NETWORKING

(Regulations 2021)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Identify the WLAN technologies for the following requirements:

   (a) Simple and extremely cheap senders and receivers, which are integrated into all mobiles devices.

   (b) No licenses are needed and shielding is very simple.

   (c) If the receiver is not tuned to the right frequency, signal looks like background noise.

   (d) Systems normally transmit in the 430 to 470 MHz frequency range.

2. List the MAC features of WIMAX.

3. When a mobile node move from one network to another network, how does it find the foreign agent?

4. What advantages does the use of lPv6 offer for mobility? Where are the entities of mobile IP now?

5. How does HSDPA works?

6. What are the components and protocol involved in LTE Architecture?

7. State the significance of MVNO.

8. What are the merits of LTE over 4G?

9. What are the technological challenges of 5G networks?

10. Mention the key air interface technologies that will enable 5G.

PART B — (5 × 13 = 65 marks)

11. (a) How are hidden terminal and fairness problems regarding channel access solved in IEEE 802.11, HiperLAN2, and Bluetooth respectively? How is the waiting time of a packet ready to transmit reflected?

Or

(b) A person wants to construct WPAN includes Wireless mouse, Wearable devices, USB flash drives, Digital cameras, Bluetooth, WiFi, Thermostats, Security systems, Lighting controls, Motion sensors, Personal server and Leak sensors. Use the suitable WPAN technologies along with its specification in detail.

12. (a) Explain how tunneling works in general and especially for mobile IP using IP-in-IP, minimal, and generic routing encapsulation, respectively. Discuss the advantages and disadvantages of these three methods.

Or

(b) (i) How does dynamic source routing handle routing? What is the motivation behind dynamic source routing compared to other routing algorithms from fixed networks? (6)

(ii) Supporting mobility only on lower layers up to the network layer is not enough to provide mobility support for application. Most applications rely on a transport layer, such as TCP. What enhancement needs to be performed in TCP so that it could be made adopted to the wireless/mobile environment? (7)

13. (a) Compare and contrast functionalities of 3G-MSC, SGSN, GGSN, SMS-GMSC.

Or

(b) "TD-SCDMA offers the advantages of the of any TDD system". Justify the statement, also discuss the TD-SCDMA specification and its operation in detail.

14. (a) Discuss in detail about the 4G features, challenges and its applications.

Or

(b) Illustrate the architecture of IMS and discuss the broadband wireless access and services.

15. (a) Illustrate how does the 5G NR differ from 5G also elucidate the architecture of Ultra dense Network and its technologies for 5G.

Or

(b) Explain in details about the generalized frequency division multi — carrier principles.

PART C — (1 × 15 = 15 marks)

16. (a) Explain the system architecture and protocol architecture of IEEE 802.11.

Or

(b) 5G devices will be expected to possess a variety of attributes in order to be able to provide energy-efficient and high-speed connectivity to the end user, whilst being multi-mode in nature. Address the key characteristics of single MIMO, Multi-user MIMO and massive MIMO for a 5G terminal with neat diagram.

———————