



SRM VALLIAMMAI ENGINEERING COLLEGE

(An Autonomous Institution)

SRM Nagar, Kattankulathur – 603 203.

DEPARTMENT OF INFORMATION TECHNOLOGY QUESTION BANK

SUBJECT : IT8602 – Mobile Communication

SEM / YEAR: VI Sem / III Year

| UNIT I - INTRODUCTION | | | |
|--|---|----------|---------------|
| Introduction to Mobile Computing – Applications of Mobile Computing- Generations of Mobile Communication Technologies-MAC Protocols – SDMA- TDMA- FDMA- CDMA | | | |
| PART - A | | | |
| Q.No | Questions | BT Level | Competence |
| 1. | Define Mobile computing. | BTL1 | Remembering |
| 2. | List the advantages of mobile computing. | BTL1 | Remembering |
| 3. | Distinguish between Mobile Computing and Wireless Networking. | BTL2 | Understanding |
| 4. | Recall the wireless networking standards used in Mobile computing. | BTL1 | Remembering |
| 5. | Distinguish between infrastructure-based network and infrastructure less network. | BTL2 | Understanding |
| 6. | Analyze the challenges in Wireless Communication. | BTL4 | Analyzing |
| 7. | Classify the types of wireless networks. | BTL3 | Applying |
| 8. | Illustrate Ad hoc Networks with pictorial representation. | BTL3 | Applying |
| 9. | Give the uses of Ad-Hoc networks. | BTL2 | Understanding |
| 10. | What are the limitations of Mobile computing? | BTL1 | Remembering |
| 11. | List the issues of wireless MAC. | BTL4 | Analyzing |
| 12. | Describe the function of presentation, application and data tier of mobile environment. | BTL2 | Understanding |
| 13. | What is the role of a MAC protocol? | BTL1 | Remembering |
| 14. | Classify the types of MAC Protocol. | BTL3 | Applying |
| 15. | List some random assignment scheme. | BTL1 | Remembering |
| 16. | Inspect hidden and exposed terminal problems in infrastructure-less network. | BTL4 | Analyzing |
| 17. | When does the exposed terminal problem arise? Compose a role which is played by Radio/Infrared signals play in Mobile Computing? | BTL6 | Creating |
| 18. | “MAC protocol designed for infrastructure based wireless network may not work satisfactory in infrastructure-less environment”-Justify. | BTL5 | Evaluating |
| 19. | Formulate a reason why Collision Detection based protocol is not suitable for wireless networks? | BTL6 | Creating |

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| 20. | What is MACA protocol? In which environment is it suitable? | BTL5 | Evaluating |
| PART-B | | | |
| 1. | (i) What is Mobile Computing? Explain its applications in the real world scenario. (7) (ii) Differentiate between mobile computing and wireless networking. (6) | BTL4 | Analyzing |
| 2. | (i) Classify the generations of mobile communication technologies. (8) (ii) Apply mobile computing to design Taxi dispatcher and monitoring service. Explain the components in detail. (5) | BTL4 | Analyzing |
| 3. | (i) Explain hidden and exposed terminal problem in infrastructure-less network. (7) (ii) Describe architecture of mobile computing. (6) | BTL1 | Remembering |
| 4. | (i) Describe the important functional difference between 1G, 2G and 3G cellular networks. (8) (ii) Is 3G cellular wireless technology superior to 2G technology? Justify your answer. (5) | BTL1 | Remembering |
| 5. | Explain the various taxonomy of MAC protocols in detail. (13) | BTL3 | Applying |
| 6. | (i) Explain the wireless MAC issues in detail. (7) (ii) Illustrate the working of SDMA and gives its application. (6) | BTL2 | Understanding |
| 7. | What are the fixed assignment schemes of MAC protocol? Explain their mechanism in detail. Compare and contrast them. (13) | BTL1 | Remembering |
| 8. | Differentiate between FDMA, TDMA and CDMA. (13) | BTL1 | Remembering |
| 9. | Discuss the basic scheme of the CDMA protocol. (13) | BTL2 | Understanding |
| 10. | (i) What are the principle responsibilities of the MAC Protocol? (6) (ii) How does MAC protocol for wireless networks differ from those in wired network? (7) | BTL2 | Understanding |
| 11. | Explain the various random assignment schemes that are used in MAC protocol. (13) | BTL3 | Applying |
| 12. | What is MACA protocol? In which environment is it suitable? Briefly explain its working. (13) | BTL4 | Analyzing |
| 13. | Explain why MAC scheme in wired network fail in wireless networks. (13) | BTL5 | Evaluating |
| 14. | Name any one scheduled based MAC protocol and explain in detail. (13) | BTL6 | Creating |
| PART - C | | | |
| 1. | Prepare a brief account of scheduled based MAC protocol. (15) | BTL 6 | Creating |
| 2. | (i) Compare 1G and 2G cellular wireless communication technologies. (8) (ii) What do you understand by 2.5G? How is it different from 2G and 3G technologies? (7) | BTL 5 | Evaluating |
| 3. | How does MACA protocol solve the hidden/exposed terminal problem? (15) | BTL 4 | Analyzing |
| 4. | How does the multiple accesses with collision avoidance (MACA) scheme work? (15) | BTL 4 | Analyzing |

| UNIT II - MOBILE TELECOMMUNICATION SYSTEM | | | |
|---|--|----------|---------------|
| GSM – Architecture – Protocols – Connection Establishment – Frequency Allocation – Routing – Mobility Management – Security –GPRS- UMTS- Architecture | | | |
| PART - A | | | |
| Q.No | Questions | BT Level | Competence |
| 1. | Is 3G cellular wireless technology superior to 2G technology? Justify your answer. | BTL5 | Evaluating |
| 2. | Identify the characteristics of 4G and 5G Cellular Networks. | BTL3 | Applying |
| 3. | List the 3 important features of GSM security. | BTL1 | Remembering |
| 4. | Summarize the following. MSC and BSC. | BTL2 | Understanding |
| 5. | Experiment with Call Routing. | BTL3 | Applying |
| 6. | Name the Teleservices provided by GSM. | BTL1 | Remembering |
| 7. | What is the frequency range of uplink and downlink in GSM network? | BTL1 | Remembering |
| 8. | Describe the function of HLR and VLR. | BTL2 | Understanding |
| 9. | What is multicasting? | BTL1 | Remembering |
| 10. | Point out the major functions in NSS. | BTL4 | Analyzing |
| 11. | Analyse the need for EIR. | BTL4 | Analyzing |
| 12. | Define GPRS and list its services. | BTL2 | Understanding |
| 13. | Give the Functions of GGSN? | BTL2 | Understanding |
| 14. | What are the information are stored in SIM? | BTL1 | Remembering |
| 15. | GPRS is advantageous than GSM. Justify the statement. | BTL5 | Evaluating |
| 16. | Generalize the limitations of GPRS. | BTL6 | Creating |
| 17. | What are the main elements of UMTS? | BTL1 | Remembering |
| 18. | Define Handoff. What are its types? | BTL4 | Analyzing |
| 19. | Can UMTS networks easily work with the existing GSM/GPRS networks? Justify your answer. | BTL3 | Applying |
| 20. | Write the suggestions of mobile phone with respect to human body. | BTL6 | Creating |
| PART-B | | | |
| 1. | (i) Describe GSM architecture and its services in detail. (7) (ii) Explain GSM Authentication and Security. (6) | BTL2 | Understanding |
| 2. | Identify the services offered by GSM and explain in detail. (13) | BTL3 | Applying |
| 3. | Analyze the purpose of radio interface U _m in GSM. (13) | BTL4 | Analyzing |
| 4. | Explain the protocol architecture for signaling in GSM. (13) | BTL5 | Evaluating |
| 5. | (i) Recall the terms a. MSISDN (2) b. IMSI (2) c. TMSI (2) d. MSRN (2) (ii) Show the procedure for MTC and MOC. (5) | BTL1 | Remembering |
| 6. | Examine in detail about the various types of handover in GSM. Also | BTL4 | Analyzing |

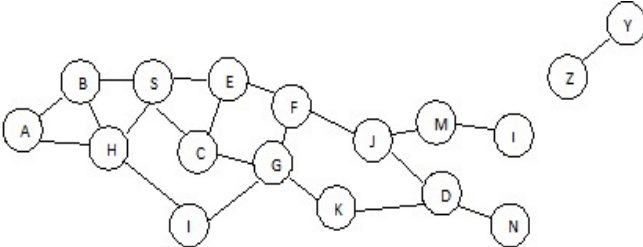
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| | discuss the timeline diagram of the Intra MSC handover. (13) | | |
| 7. | Elaborate frequency allocation with its various methods.(13) | BTL6 | Creating |
| 8. | (i) Describe the GPRS architecture reference model. (7) (ii) State its Advantages and Disadvantages. (6) | BTL1 | Remembering |
| 9. | Explain the functions of GPRS protocol stack with a diagram. (13) | BTL2 | Understanding |
| 10. | (i) Discuss the services of GPRS. (7) (ii) What are the advantages of GPRS over GSM? (6) | BTL1 | Remembering |
| 11. | What do you mean by Virtual Home Environment (VHE)? Identify how VHE is realized in 3G networks? (13) | BTL3 | Applying |
| 12. | Explain in detail network architecture of UMTS with a neat diagram. (13) | BTL2 | Understanding |
| 13. | Recall the two basic classes of handovers in UMTS. (13) | BTL1 | Remembering |
| 14. | What is UMTS? Analyze the functions of HLR and VLR in call routing & roaming?(13) | BTL4 | Analyzing |
| PART-C | | | |
| 1. | What are the functions of authentication and encryption in GSM? How is system security maintained? (15) | BTL 4 | Analyzing |
| 2. | Do mobile phones affect the human body negative? Explain your answer. (15) | BTL 5 | Evaluating |
| 3. | Analyze the applications of GPRS with its advantages and disadvantages. (15) | BTL 4 | Analyzing |
| 4. | Discuss the domains and interfaces of Universal Mobile Telecommunication System. (15) | BTL 6 | Creating |

| UNIT III - WIRELESS NETWORKS | | | |
|---|--|----------|---------------|
| Wireless LANs and PANs – IEEE 802.11 Standard – Architecture – Services – Blue Tooth- Wi-Fi – WiMAX | | | |
| PART - A | | | |
| Q.No | Questions | BT Level | Competence |
| 1. | What is WLL? | BTL1 | Remembering |
| 2. | What is the advantage of infra-red technology? | BTL1 | Remembering |
| 3. | Give examples for mobile adhoc networks. | BTL2 | Understanding |
| 4. | What is the format of frame control field of 802.11 MAC packet structure? | BTL1 | Remembering |
| 5. | Define Ad hoc wireless network with example. | BTL2 | Understanding |
| 6. | Differentiate between Wi-Fi and WiMAX. | BTL4 | Analyzing |
| 7. | Why is WiMAX forum formed? | BTL3 | Applying |
| 8. | Identify why wireless LAN services are of lower quality than wired LAN. | BTL3 | Applying |
| 9. | Compare wired networks and adhoc wireless networks based on routing. | BTL2 | Understanding |
| 10. | What are the three low power states of a Bluetooth state? | BTL1 | Remembering |
| 11. | Why cannot wireless LANs implement CSMA/CD? | BTL4 | Analyzing |
| 12. | Mention the design goals of WLANs. | BTL2 | Understanding |
| 13. | What is the difference between infrastructure and ad-hoc networks? | BTL1 | Remembering |
| 14. | Identify the design goals of 802.11. | BTL3 | Applying |
| 15. | What is piconet? What restricts the number of active devices in a piconet? | BTL1 | Remembering |
| 16. | Inspect the advantages of WLANs. | BTL4 | Analyzing |

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|-----------------|--|-------|---------------|
| 17. | Propose the elements of Bluetooth core protocols. | BTL6 | Creating |
| 18. | Compare infra-red and radio transmission. | BTL5 | Evaluating |
| 19. | Imagine the user scenarios for WPANs. | BTL6 | Creating |
| 20. | Evaluate the criteria's under which WPAN is discussed using IEEE 802.11. | BTL5 | Evaluating |
| PART-B | | | |
| 1. | (i) Explain the system architecture of IEEE 802.11. (7) (ii) Analyze HiperLAN architectural components and their interactions. (6) | BTL4 | Analyzing |
| 2. | Explain the IEEE 802.11 MAC management. (13) | BTL1 | Remembering |
| 3. | Describe Bluetooth in detail. (13) | BTL1 | Remembering |
| 4. | (i) Explain the various IEEE 802.11 standards in detail. (7) (ii) Explain the services offered by IEEE 802.11 standard. (6) | BTL2 | Understanding |
| 5. | (i) Explain the features of HiperLAN. (7) (ii) Explain WLL in detail. (6) | BTL2 | Understanding |
| 6. | (i) Explain contention free access using polling mechanism in IEEE 802.11. (8) (ii) Explain the protocol stack of Bluetooth. (5) | BTL2 | Understanding |
| 7. | (i) Briefly explain about features and applications of ad-hoc networks. (7) (ii) Explain how power management is done in IEEE 802.11 infrastructure architecture. (6) | BTL4 | Analyzing |
| 8. | Explain the working principle of the MAC layer of Bluetooth. (13) | BTL1 | Remembering |
| 9. | (i) Why is the physical layer in IEEE 802.11 subdivided? Discuss. (7) (ii) Can a network be wireless, but not mobile? Discuss. (6) | BTL4 | Analyzing |
| 10. | (i) Model the architecture of WiFi in detail. (7) (ii) Describe the architecture of WiMAX in detail. (6) | BTL3 | Applying |
| 11. | Identify the system and protocol structure of 802.16 standard. (13) | BTL3 | Applying |
| 12. | Elaborate on mobile ad-hoc networks. (13) | BTL6 | Creating |
| 13. | (i) With a suitable diagram explain the extended service set. (7) (ii) Discuss the advantages and disadvantages of WLAN. (6) | BTL1 | Remembering |
| 14. | Briefly explain about features and applications of adhoc networks. (13) | BTL5 | Evaluating |
| PART - C | | | |
| 1. | Compose the system and protocol architecture of IEEE 802.11 standard. (15) | BTL 6 | Creating |
| 2. | Interpret the two MAC sublayers defined by IEEE 802.11 standard and explain. (15) | BTL 5 | Evaluating |
| 3. | Inspect the functions of MAC & physical layer of IEEE 802.16 in detail. (15) | BTL 4 | Analyzing |
| 4. | Analyze the various types of HiperLANs. (15) | BTL 4 | Analyzing |

| UNIT IV - MOBILE NETWORK LAYER | | | |
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| Mobile IP – DHCP – AdHoc– Proactive and Reactive Routing Protocols – Multicast Routing- Vehicular Ad Hoc networks (VANET) –MANET Vs VANET – Security | | | |
| PART - A | | | |
| Q.No | Questions | BT Level | Competence |
| 1. | What is ad hoc network? | BTL1 | Remembering |
| 2. | Differentiate cellular with Ad Hoc networks. | BTL4 | Analyzing |

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| 3. | List the characteristics of MANETs. | BTL1 | Remembering |
| 4. | Identify the issues that are addressed by routing protocol in MANET? | BTL1 | Remembering |
| 5. | What is Mobile IP? | BTL1 | Remembering |
| 6. | List the advantages in DSR. | BTL1 | Remembering |
| 7. | Compare AODV and DSR protocols. | BTL2 | Understanding |
| 8. | Name the entities in Mobile IP. | BTL2 | Understanding |
| 9. | What is IP-in –IP encapsulation? | BTL2 | Understanding |
| 10. | List the applications of MANET. | BTL1 | Remembering |
| 11. | Classify the agent discovery in mobile IP. | BTL3 | Applying |
| 12. | Compare minimal encapsulation and IP -in –IP encapsulation. | BTL3 | Applying |
| 13. | Relate the tunneling and mobile IP. | BTL3 | Applying |
| 14. | Distinguish Proactive and Reactive protocols. | BTL4 | Analyzing |
| 15. | Summarize about security issues in MANET. | BTL5 | Evaluating |
| 16. | Compare DSDV and DSR. | BTL5 | Evaluating |
| 17. | Outline the concept of RTT. | BTL2 | Understanding |
| 18. | Can cellular network and wireless LAN be considered as ad hoc networks? Justify. | BTL6 | Creating |
| 19. | Construct a VANET. | BTL6 | Creating |
| 20. | Compare and contrast MANET Vs VANET. | BTL4 | Analyzing |
| PART-B | | | |
| 1. | (i) Explain Characteristics, Applications of MANET. (7) (ii) Explain DSR Routing Protocols in detail. (6) | BTL2 | Understanding |
| 2. | Explain about DHCP client initialization procedure. (6) What are reactive and proactive routing protocols? Specify its advantages and disadvantages.(7) | BTL1 | Remembering |
| 3. | Explain the traditional routing protocols. (13) | BTL2 | Understanding |
| 4. | (i) What are multicast routing protocols? (7) (ii) What are reactive and proactive protocols? Specify its advantages and disadvantages. (6) | BTL1 | Remembering |
| 5. | (i) Briefly discuss about agent discovery in Mobile IP.(7) (ii) Describe in detail the registration procedure in Mobile IP.(6) | BTL1 | Remembering |
| 6. | (i) Analyze DSDV routing in detail. (7) (ii) Mention the advantages and Disadvantages of DSDV. (6) | BTL4 | Analyzing |
| 7. | Discuss route discovery and route maintenance mechanisms in DSR with illustrations. List its merits and demerits. (13) | BTL2 | Creating |
| 8. | Explain the design issues in MANET and the applications of adhoc network. (13) | BTL5 | Evaluating |
| 9. | (i) Illustrate the classification of unicast MANET Routing Protocols. (7) (ii) Explain how multicast routing is carried out in ad-hoc networks. (6) | BTL3 | Applying |
| 10. | (i) What are the security threats in a MANET? What are the factors responsible for limited security in MANETs? (6) (ii) For every layer of MANET protocol stack, show at least one type of security attack that exploits vulnerability at that layer. (7) | BTL3 | Applying |
| 11. | With a diagram explain about DHCP and its protocol architecture. (13) | BTL4 | Analyzing |

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| 12. | Describe the architecture of VANET with a neat diagram. (13) | BTL1 | Remembering |
| 13. | Explain any two VANET routing protocol with an example. (13) | BTL4 | Analyzing |
| 14. | (i) Draw and explain the architecture of VANET. (7) (ii) Discuss the various security and attacks on VANET. (6) | BTL2 | Understanding |
| PART - C | | | |
| 1. | <p>Consider the network given below. Here 'S' is source node and 'D' is target node. Illustrate the process of route discovery, route reply, data delivery and route caching using DSR. Explain the approach. (15)</p>  | BTL 4 | Analyzing |
| 2. | Write the three approaches to support the IP micro-mobility.(15) | BTL 5 | Evaluating |
| 3. | Write short notes on: (i) Ad Hoc On-demand Distance Vector(AODV) (8) (ii) Zone Routing Protocol. (7) | BTL 4 | Analyzing |
| 4. | A major task of the designer of a wireless sensor network is prolonging the life of the network. Explain how this is achieved while designing a MANET.(15) | BTL 6 | Creating |

UNIT V - MOBILE TRANSPORT AND APPLICATION LAYER

Mobile TCP- WAP – Architecture – WDP – WTLS – WTP –WSP – WAE – WTA Architecture – WML

PART - A

| Q.No | Questions | BT Level | Competence |
|------|--|----------|---------------|
| 1. | Mention the basic features of WML. | BTL2 | Understanding |
| 2. | Define Mobile TCP. | BTL1 | Remembering |
| 3. | List the advantages of M-TCP. | BTL1 | Remembering |
| 4. | What is WTLS? | BTL1 | Remembering |
| 5. | Name the classes of wireless transaction protocol. | BTL1 | Remembering |
| 6. | Write the features of WSP. | BTL2 | Understanding |
| 7. | What are the components of are in WAP? | BTL2 | Understanding |
| 8. | Write the applications of M-TCP. | BTL3 | Applying |
| 9. | Organize standard libraries for WML script. | BTL3 | Applying |
| 10. | Write a note on session management. | BTL3 | Applying |
| 11. | What is indirect TCP? | BTL4 | Analyzing |
| 12. | Analyze the mechanism of the Transmission Control Protocol. | BTL4 | Analyzing |
| 13. | Evaluate the service request structure of WTP class 0. | BTL5 | Evaluating |
| 14. | Compose the basic objective of WAP. | BTL6 | Creating |
| 15. | Draw the time sequence chart for WSP /B session termination. | BTL6 | Creating |
| 16. | Define wireless application environment. | BTL1 | Remembering |
| 17. | Where i-mode is used? | BTL1 | Remembering |

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| 18. | Why we used SyncML? | BTL2 | Understanding |
| 19. | Examine the advantages of Snooping TCP. | BTL4 | Analyzing |
| 20. | Assess the transaction oriented TCP connection setup. | BTL5 | Evaluating |
| PART-B | | | |
| 1. | What is wireless markup language? Write its features. (13) | BTL1 | Remembering |
| 2. | Illustrate the classical TCP improvements. (13) | BTL2 | Understanding |
| 3. | Describe WSP/B over WTP. (13) | BTL1 | Remembering |
| 4. | Elaborately explain about Push architecture. (13) | BTL4 | Analyzing |
| 5. | (i) Interpret the WTP class 2 protocols. (7) (ii) Summarize the working of Snooping TCP. (6) | BTL2 | Understanding |
| 6. | Draw and explain the logical model of wireless application environment. (13) | BTL2 | Understanding |
| 7. | Examine the wireless transport layer security. (13) | BTL4 | Analyzing |
| 8. | Compare the functions of various types of TCPs. (13) | BTL5 | Evaluating |
| 9. | List the components of WAP architecture and explain in detail. (13) | BTL4 | Analyzing |
| 10. | Discuss about the i) i- mode protocol stack (7) ii) SyncML (6) | BTL6 | Creating |
| 11. | Recall about traditional TCP protocol. (13) | BTL1 | Remembering |
| 12. | Organize the wireless application protocol architecture. (13) | BTL3 | Applying |
| 13. | Identify the service primitives of WDP. (13) | BTL5 | Evaluating |
| 14. | Relate the WMLscript complements to WML. (13) | BTL1 | Remembering |
| PART - C | | | |
| 1. | Elaborately discuss about functions of i) Indirect TCP (5) ii) Snooping TCP (5) iii) Mobile TCP (5) | BTL4 | Analyzing |
| 2. | Explain the functions of the wireless transaction protocol. (15) | BTL 5 | Evaluating |
| 3. | With neat timing chart explain about wireless session protocol. (15) | BTL 4 | Analyzing |
| 4. | Describe the logical diagram of wireless telephone applications. (15) | BTL 6 | Creating |