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## CORRESPONDENCE COURSE

**MASTER OF SCIENCE IN MOBILE COMMUNICATION & INTERNET  
TECHNOLOGIES (PREVIOUS) DEGREE EXAMINATIONS  
FEBRUARY-2009**

Time : 3 Hrs.

Max.Marks: 80

**Paper-I: Data Structures and System Software (MCEC11)**


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Note: Answer any FOUR questions. All questions carry Equal Marks 4 \* 20 = 80

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|---|--|----|
| 1 | a) Bring out the similarities and differences between structures and unions. Write C programs to illustrate the usage of structures and unions.                        | 10 |
|   | b) Define a stack data structure. Write algorithms for the operations performed on stacks. Include boundary conditions.  | 10 |
| 2 | a) "Recursion is luxury in programming" – comment on the statement. Write a recursive algorithm and the equivalent iterative algorithm to generate Fibonacci sequence. | 10 |
|   | b) Define a circular list. Write algorithms for the operations performed on lists.   | 10 |
| 3 | a) Define the queue data structure. Write algorithms for the operations performed on queues.   | 10 |
|   | b) Explain any one sorting algorithm. With a data set of 10 elements show the working of the sorting algorithm.  | 10 |
| 4 | a) Define binary tree and the tree traversals performed on binary tree.  | 10 |
|   | b) Explain the machine architecture of SIC.  | 10 |
| 5 | a) With a block diagram explain the working of a single-pass assembler.  | 10 |
|   | b) Define binary search tree. Write algorithms to perform insertion and deletion operations on a binary search tree.   | 10 |
| 6 | a) What is hashing? Explain different methods of hashing.  | 10 |
|   | b) Explain the concepts of program relocation and machine independent assembler features.  | 10 |

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**PAPER 2 : MOBILE COMPUTING (MCEC12)**

Note: Answer any FOUR questions. All questions carry Equal Marks

4 \* 20 = 80

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|---|--|---------|
| 1 | a) Give the reasons, why the baseband signal cannot be directly transmitted in a wireless system.  |         |
|   | b) Explain the different types of handover in GSM.   |         |
|   | c) Differentiate between Frequency Division Multiplexing and Time Division Multiplexing.   | 4+6+10  |
| 2 | a) Explain why CSMA/CD fails in wireless world. How "Multiple Access with Collision Avoidance" can help to solve this problem.           |         |
|   | b) Differentiate between frequency shift keying and phase shift keying.  |         |
|   | c) Compare the performance of slotted aloha with that of pure aloha.   | 10+ 6+4 |
| 3 | a) Draw the functional architecture of a GSM system. Explain the various subsystems.   |         |
|   | b) With the help of a neat diagram, explain the UMTS ( Universal Mobile Telecommunication System) network architecture.                  | 10+10   |
| 4 | a) What is GEO? What are the advantages and disadvantages of a satellite in GEO?   |         |
|   | b) What is DAB? Draw a DAB frame structure and explain SC, FIC and MSC.  | 10+10   |
| 5 | a) Briefly describe<br>(i) The features of UTRA – FDD (W-CDMA) and UTRA – TDD (TD-CDMA).<br>(ii) Hard handover and Soft handover in UMTS | 10+10   |
|   | b) Describe the major baseband states of a Bluetooth device. What are the low power states used to save battery life?                    | 10+10   |
| 6 | a) Explain any one routing protocol used in mobile ad-hoc networks.  |         |
|   | b) Write a note (i) Transaction Oriented TCP (ii) TCP over 2.5/3G – wireless networks  | 10+10   |

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## Paper 3 : DATA COMMUNICATIONS (MCEC13)

**Note: Answer any FOUR questions. All questions carry Equal Marks     4 \* 20 = 80**

1	a)	Discuss the evolution of Internet Technology briefly.	05
	b)	Compare and Contrast the Services, Interfaces and Protocols in Computer Networks.	09
	c)	List out the various switching techniques, with suitable example, explain the switching techniques in brief.	06
2	a)	Explain with suitable diagram OSI – ISO reference model and TCP/IP reference model.	08
	b)	What are the protocols of Application Layer, discuss the importance of each one neatly.	08
	c)	With suitable example discuss the various DNS name specifications.	04
3	a)	Distinguish between the Analog Signal and Digital Signal in detail.	06
	b)	Discuss the domain characteristics of various communications channel.	08
	c)	Compare Baud rate, Bandwidth and Bit-rate in brief.	06
4	a)	Calculate the required channel capacity system having bandwidth 4KHz and channel having signal levels 16 & 32 with SNR value is 30dB.	08
	b)	What are the essential characteristic features of selecting any physical media? Explain merits and demerits of various physical media in detail.	08
	c)	Discuss about Error detection techniques with examples.	04
5	a)	Define Multiplexing; Explain various multiplexing techniques with suitable examples.	10
	b)	Explain briefly the standard specification of SONET frame structure.	05
	c)	How SONET Networks are different from Optical transport networks.	05
6	a)	With neat diagram explain any two Data Link Layer protocols.	08
	b)	What are the characteristic features of HDLC?	06
	c)	Explain the properties of DSL (Digital Subscriber Line) .	06

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**PAPER 4: Code Division Multiple Access ((MCEC111)  
(Elective1)**

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Note: Answer any FOUR questions. All questions carry Equal Marks 4 \* 20 = 80

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|---|---|---|----|
| 1 | a | Compare TDMA, FDMA, CDMA technologies for multiple channel access.  | 6  |
|   | b | Estimate the number of mobile users that can be supported by a CDMA system using an RF bandwidth of 2 MHz to transmit data at 10.4 KBPS. Assume the $E_b/N_0 = 8\text{dB}$ ; the interference from neighboring cells $\beta = 60\%$ ; voice availability factor $v = 50\%$ ; power control accuracy factor $\alpha = 0.9$ . | 4  |
|   | c | With a neat diagram describe the DSS system using Coherent BPSK.  | 10 |
| 2 | a | What is antenna diversity? How does it improve the performance of a wireless communication system?  | 10 |
|   | b | Write short notes on (1) SDMA (2) Bit interleaving  | 10 |
| 3 | a | Describe the CDMA call acknowledgement procedure, highlighting the different messages exchanged.  | 10 |
|   | b | Describe the A-Interface of TIA-IS-95 CDMA,   | 10 |
| 4 | a | What is handoff? Explain its different types.   | 5  |
|   | b | Describe the role of pilot sets in soft handoff.  | 5  |
|   | c | Bring out the need for power control during hand off. Differentiate between open loop and closed loop power control.  | 10 |
| 5 | a | Describe the reverse link open loop power control.  | 10 |
|   | b | Discuss the dependence of interface margin on the load factor in a radio network.   | 5  |
|   | c | Write short notes on Inter frequency handoff.   | 5  |
| 6 | a | Describe the protocols used in cdma2000 ARQ's   | 5  |
|   | b | With a neat diagram describe the layering structure of cdma2000.  | 10 |
|   | c | Write short notes data services in CDMA2000.  | 5  |

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**Paper 4-Multimedia Computing(MCEC112)(Elective-I)**

Note: Answer any FOUR questions. All questions carry Equal Marks

4 \* 20 = 80

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|---|--|------|
| 1 | a) What are the elements of Multimedia? Explain .  | [06] |
|   | b) What are presentation spaces and presentation values? Give examples   | [08] |
|   | c) What are the presentation dimensions?   | [06] |
| 2 | a) What are data streams? How are they classified with respect to and co-ordination?   | [10] |
|   | b) In Speech synthesis, how is the speech output achieved in real time?  | [10] |
| 3 | a) What is the audio data rate of a stereo which has a sampling rate of 44,100Hz and 16 bit linear quantization.   | [06] |
|   | b) Explain different image compression formats   | [08] |
|   | c) How does a raster display device work?  | [06] |
| 4 | a) What are the parameters that define HDTV?   | [07] |
|   | b) Explain the process of transmission in animation.   | [07] |
|   | c) A video sequence consist of 25 full frames per second. The luminance(Y) and chrominance of each pixel are coded using a total of 3 bytes. As per PAL standard, each frame consist of 625 lines and a horizontal resolution of more than 833 pixels. Y is sampled at 13.5MHz and (R-Y) and (B-Y) is sampled using 6.75MHz. Samples are coded uniformly using 8 bits. What is the required storage space. | [06] |
| 5 | c) What are the different frames in MPEG video compression? Explain each frames.   | [12] |
|   | d) Explain arithmetic coding. How is it different Huffman coding?  | [06] |
| 6 | a) Explain dedicated systems in multimedia .   | [10] |
|   | b) What are the different multimedia systems?  | [10] |

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**PAPER 5: JAVA AND J2ME (MCEC121)  
ELECTIVE-I**

Note: Answer any FOUR questions. All questions carry Equal Marks

4 \* 20 = 80

1.
  - a. Discuss the features of JAVA technology for Object Oriented Software development and web applications.
  - b. With an example, explain the concept of method overriding in Java.
  - c. What are abstract classes? Why do we require them? (8+6+6)
2.
  - a. Explain how runtime errors are handled in Java. Illustrate.
  - b. Discuss the FILE I/O using Stream Reader concept.
  - c. Explain how applets help in developing internet applications. (8+6+6)
3.
  - a. Explain how, database connectivity can be achieved considering any DBMS of your choice within Java programming environment.
  - b. Write on CGI security issues.
  - c. Discuss the server side specifications considering PHP as an interface. (10+5+5)
4.
  - a. Explain Vector and List with an example highlighting its significance in handling matrix data.
  - b. What are the components of AWT? Discuss any two in detail considering a simple menu based problem. (10+10)
5.
  - a. What are the components of J2ME? Discuss any two in detail.
  - b. Define thread. Discuss any four functions supported in Java to handle thread.
  - c. Explain how other programming language such as 'C' can be called within Java environment with a simple example. (8+8+4)
6.
  - a. Define socket. Discuss any four system calls supported in Java for socket programming.
  - b. Write short notes on:
    - i. IrDA
    - ii. Push Registry
    - iii. HTML Image and Anchor tags. (10+3+3+4)

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**PAPER 5: WIRELESS AD ATM NETWORK(MCEC122)  
(Elective-II)**

Note: Answer any FOUR questions. All questions carry Equal Marks

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- 1 a) Describe the characteristics of Cellular and Cordless technologies and also explain the MAHO. (10 Marks)
- b) Describe in detail the three measurements used to determine quality of a channel. (10 Marks)
- 2 a) What does the term GTT mean? When is GTT needed? And also explain the channel assignment schemes. (10 Marks)
- b) Mention at least ten IS-41 TCAP message operations and briefly explain them. (10 Marks)
- 3 a) With a neat diagram describe the CDPD network reference model. In this context explain the working of CDPD 'sleep mode' (10 Marks)
- b) Describe the requirements of GSM and explain the GSM architecture. (10 Marks)
4. a) Give a detailed description of the GSM and explain the GSM architecture with a neat diagram. (10 Marks)
- b) Explain any two solutions for reducing the international call delivery cost in GSM networks. Use appropriate diagrams to substantiate your answer. (10 Marks)
5. a) Explain in detail the differences between the WLAN and WPAN (10 Marks)
- b) What are the five major challenges for implementation of Wireless LANs that existed from the beginning of the industry? (10 Marks)
6. a) Explain the CSMA/CA protocol of IEEE 802.11 and also give comparison of W-CDMA and CDMA-2000. (10 Marks)
- b) Explain the protocol stack of the Blue tooth with a neat diagram. (10 Marks)