Department of Computer Science and Engineering
Mid Semester (Winter) Examination
II Semester M.Tech (CSE)
Advanced Computer Networks (CSC52102)

Full Marks: 60 **Time: 2Hrs.**

Instruction : (i) Answer All Questions.
(ii) Write answers to the point.
(iii) Use Separate Answer book for Part I & II

PART- I (Maximum Marks: 40)

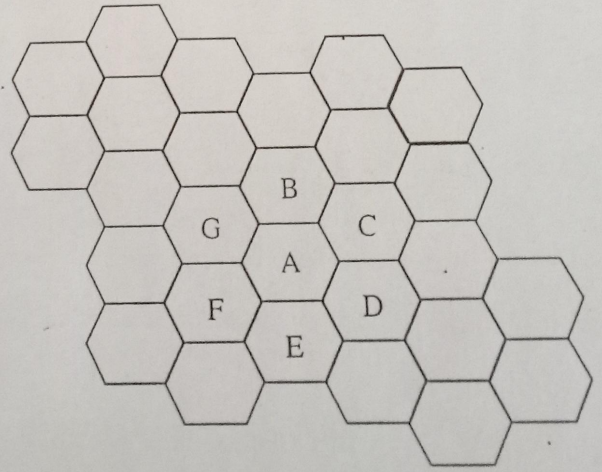
Q. No.	Question	Marks
1.(a)	Explain: (i) Exposed Terminal Problem (ii) Transmission modes.	3
(b)	Discuss the transition strategies to move from IPv4 to IPv6. You have an interface on a router with the IP address of 192.168.192.10/29. What is the broadcast address the hosts will use on this LAN?	3
(c)	List the services of TCP. Compare CSMA/CD and CSMA/CA. How IPv4 is made reliable?	4
2.(a)	What is near far problem? Differentiate between (i) FHMA and FDMA (ii) FDD and TDD.	5
(b)	Discuss various databases used in GSM. Explain the setup of mobile originating call in GSM.	5
3.(a)	What do you mean by agent advertisement? What is the required condition and techniques to forward broadcast datagrams by a home agent to a mobile node?	4
(b)	What are the technological challenges of m-commerce? Describe electronic cheque system. Draw WAP Protocol Stack.	6
4.(a)	What are the mobile computing functions? Describe the working of MobileIP.	5
(b)	Draw a message diagram and explain the steps of handover when a mobile node moves from one cell to another which is under different BSC, connected to the same MSC.	5

Mid Semester Examination
Subject: Soft Computing
Full Marks: 60

Instructions: Answer the questions in or

Sl. No.	Wh
1.	

5.(a)	Derive the expression between cluster size, K and shift parameters used for the frequency reuse in a cellular network.	
(b)	Define with diagram (i) FDMA/FDD (ii) FDMA/TDD. If a cellular operator is allocated 12.5 MHz for each simplex band, B_t is 12.5 MHz, B_{guard} is 10kHz and B_c is 30 kHz, find the number of channels available in a FDMA system.	
6.(a)	Discuss any two route maintenance techniques used in DSR protocol. What are the features of a wireless sensor network?	4+4
(b)	A cellular system with 7-cell cluster is given below, (i) Draw the frequency reuse pattern. (ii) If the radius of each cell is 1.6 km, find (a) inter-cell distance, (ii) frequency reuse distance and (iii) frequency reuse ratio.	6+6



Winter Semester Examination, Session 2015-2016

Examination & Semester: M.Tech (Computer Science & Engineering) II Semester
Subject: Advanced Computer Networks (CSC52102) Time: 3 hrs.
Instructions: 1. Write answers to the point. Max. Marks: 100
2. Draw diagrams neatly.

Q. No.	Question	Marks
	Section A (60 Marks)	
1.(a)	Define (i) Exposed terminal problem (ii) Near far effect.	3+3
(b)	What are the challenges in mobile computing?	5
(c)	Draw a detailed diagram of GSM architecture. What are the components of HLR and VLR?	5+4
2.(a)	Explain the concept of cell splitting. How it helps to increase the system capacity?	3+2
(b)	How flooding of control packets is limited in Location Aided Routing (LAR) protocol?	6
(c)	List the features of Wireless Application Protocol (WAP). Draw the diagram of WAP Architecture.	4+5
3.(a)	What is triangle routing in MobileIP? How a mobile node detects the movement from one subnet to other in MobileIP?	3+4
(b)	How multicasting is supported in Coda file system? Explain the concept of client caching in Coda file system.	3+4
(c)	Describe any two electronic payment methods.	6
	Section B (40 Marks) **Attempt ANY TWO questions of 20 marks each.**	
4.(a)	What is full dump and incremental dump in DSDV? How a link break is handled in DSDV and DSR? Explain with example.	4+6
(b)	How a handover of a mobile station between two cells under different MSCs is performed? Explain with message diagram.	10

Invalidate

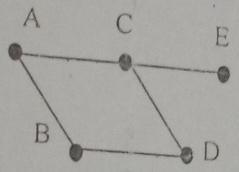
Check

Inconsitancy

Department of Computer Science and Engineering
Mid Semester (Winter) Examination
II Semester M.Tech (CSE) Session: 2015-16
Advanced Computer Networks (CSC52102)

Marks: 60 Time: 2 Hrs.

Instruction: **(i) Answer All Questions.**
(ii) Write answers to the point and draw diagrams neatly.

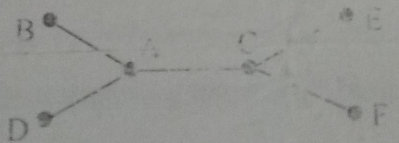
Q. No.	Question	Marks
1.(a)	Explain: (i) Hidden Terminal Problem (ii) Umbrella cell approach.	3+3
(b)	What are the conditions to update a routing table in Destination Sequenced Distance Vector (DSDV) protocol? If the given network is using DSDV for routing, explain the procedure to handle link break between node C and node E. 	3+4
2.(a)	Define (i) HLR (ii) MSRN.	2+2
(b)	What is the difference between tunnelling in MobileIP and tunnelling process of IPv4/IPv6 transition?	4
(c)	Draw the message diagram only to describe handover of a mobile node between two base stations under the same base station controller. Discuss mobile terminated call setup in GSM.	4+5
3.(a)	Draw the system structure of mobile commerce system. List the elements of Wireless Application Protocol (WAP).	4+4
(b)	Define SSMA. Discuss the procedure of FHMA.	2+4
4.(a)	What is care-of-address? How registration is done in MobileIP?	2+5
(b)	Draw frequency reuse pattern in a cellular network of cluster size 7. Find the relationship between R (radius of cell), D (distance between two neighbouring co-channel cells) and shift parameters.	3+6

Department of Computer Science and Engineering
Mid Semester (Winter) Examination
II Semester M.Tech (CSE) Session: 2014-15
Advanced Computer Networks (CSC52102)

Full Marks: 60 Time: 2 Hrs.

Instructions: (i) Answer All Questions.
(ii) Write answers to the point.
(iii) Draw the diagrams neatly.

Q. No.	Question	Marks
1.(a)	Given a channel with an intended capacity of 20 Mbps. The bandwidth of the channel is 3MHz. What signal-to-noise ratio is required in order to achieve this capacity?	3
(b)	Discuss the transition strategies to move from IPv4 to IPv6	5
(c)	Describe the procedure of Tunneling in MobileIP.	4
2.(a)	Differentiate between FDD and TDD. What is the non-linear effect in FDMA?	2+2
(b)	Draw GSM architecture. Discuss the features of Base Station Controller in GSM.	5+3
3.(a)	What is the required condition and techniques to forward broadcast datagrams by a home agent to a mobile node?	5
(b)	Draw the message diagram for handover of a mobile station between two different MSCs.	5
(c)	What are the mobile computing functions?	4
4.(a)	How HLR finds MSRN? What is MSISDN?	3+2
(b)	Discuss the route update procedure in DSDV protocol. How link disconnection of A--C, in the given network, will be handled in DSDV protocol (use routing table).	3+4
5.(a)	Define the components of Wireless Application Protocol (WAP). Draw WAP protocol stack.	3+3
(b)	State the features of mobile ad hoc networks. Describe any two electronic payment methods.	3+4



Department of Computer Science and Engineering
Mid Semester (Winter) Examination
II Semester M.Tech (CSE)
Advanced Computer Networks (CSC52102)

Full Marks: 60 **Time: 2Hrs.**

Instruction : (i) Answer All Questions.
(ii) Write answers to the point.
(iii) Use Separate Answer book for Part I & II

PART- I (Maximum Marks: 40)

Q. No.	Question	Marks
1.(a)	Explain: (i) Exposed Terminal Problem (ii) Transmission modes.	3
(b)	Discuss the transition strategies to move from IPv4 to IPv6. You have an interface on a router with the IP address of 192.168.192.10/29. What is the broadcast address the hosts will use on this LAN?	3
(c)	List the services of TCP. Compare CSMA/CD and CSMA/CA. How IPv4 is made reliable?	4
2.(a)	What is near far problem? Differentiate between (i) FHMA and FDMA (ii) FDD and TDD.	5
(b)	Discuss various databases used in GSM. Explain the setup of mobile originating call in GSM	5
3.(a)	What do you mean by agent advertisement? What is the required condition and techniques to forward broadcast datagrams by a home agent to a mobile node?	4
(b)	What are the technological challenges of m-commerce? Describe electronic cheque system. Draw WAP Protocol Stack.	6
4.(a)	What are the mobile computing functions? Describe the working of MobileIP.	5
(b)	Draw a message diagram and explain the steps of handover when a mobile node moves from one cell to another which is under different BSC, connected to the same MSC.	5

Winter Mid-Semester Examination, Session 2013-14

Examination & Semester: M.Tech (Computer Science & Engineering) II Semester

Subject: Advanced Computer Networks

Instructions:

(a) Attempt all questions.
(b) Write the answers to the point.
(c) Use Separate Answer book for Part I & II

PART – II (Maximum Marks: 20)

Q. No.	Question	Marks
5. (a)	List and briefly explain the channel assignment strategies used in cellular system.	2
(b)	Explain the concept of frequency reuse.	2
(c)	Why hexagons are used to model the coverage areas?	2
(d)	List and briefly explain the various techniques used to improve the coverage and capacity in cellular systems.	2
(e)	Briefly explain the reference model of mobile database.	2
6. (a)	How the data transaction is being carried out in mobile environment. Explain it with a help of Kangaroo and Joey Transactions model.	5
(b)	If a total of 33 MHz of bandwidth is allocated to a particular FDD cellular telephone system which uses two 25 kHz simplex channels to provide full duplex voice and control channels, compute the number of channels available per cell if system uses: (i) 4-cell reuse, (ii) 7-cell reuse, and (iii) 12-cell reuse If 1 MHz of the allocated spectrum is dedicated to control channels, determine an equitable distribution of control channels and voice channels in each cell for each of the three systems.	5

Winter Semester Examination, Session 2013-2014

Examination & Semester: **M.Tech (Computer Science & Engineering) II Semester**
Subject: **Advanced Computer Networks (CSC52102)** Time: **3 hrs**
Instructions: **1. Write answers to the point.** Max. Marks: **100**
2. Use separate answer books for part A & B

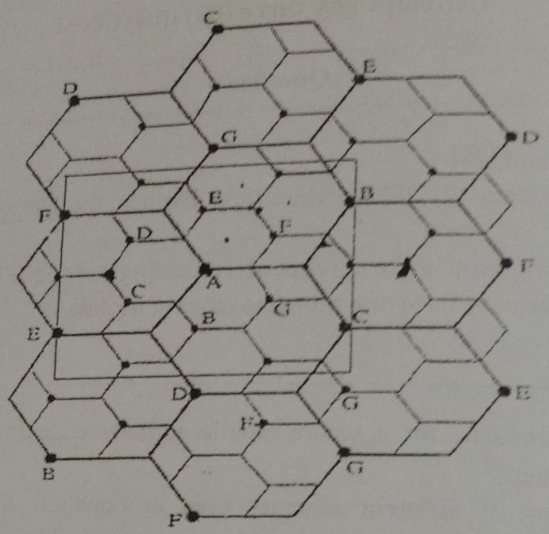
Part A – Maximum marks: 66
(Attempt any three (03) questions)

Q. No.	Question	Marks
1.(a)	Explain the working of FHMA.	6
(b)	Draw a detailed diagram of GSM architecture. Explain the Network and Switching Subsystem in detail.	4+4
(c)	Define mobility agent. Explain the concept of Tunnelling in Mobile IP. How the mobile node detects the movement from one subnet to other in Mobile IP?	2+2+4
2.(a)	What are the requirements for a secure mobile commerce payment system? What is Electronic Cash System?	3+3
(b)	Explain the working of different schemes used in Location Aided Routing (LAR) protocol.	8
(c)	What is mobile middleware? List the features of Wireless Application Protocol (WAP). Draw the diagram of WAP Architecture.	2+3+3
3.(a)	How codes are generated in CDMA? List the properties of codes used in CDMA.	2+2
(b)	What is the problem of fluctuations in DSDV? How a route is updated in DSDV?	2+2
(c)	How multicasting is supported in Coda File System? Explain the client caching mechanism of Coda File System.	3+3
(d)	Draw the message diagram and explain the steps of handover when a mobile node moves from one cell to another under same BSC.	8
4.(a)	What is Distributed Coordination Function (DCF) of IEEE 802.11 MAC sub layer?	4
(b)	What is distributed file system? How the communication performance was improved in Network File System (NFS) version 4?	2+2
(c)	What are the benefits of m-commerce? Draw the system structure for mobile handheld devices.	2+4
(d)	Explain the route discovery operation on an Ad Hoc Network using DSR as the routing protocol. Explain any three route maintenance techniques used in DSR.	5+3

Part B– Maximum Marks: 34

Instructions:
(a) Attempt all questions from Section - I.
(b) Attempt any two questions from Section – II.
(c) Answer the questions serially and to the point.

Section – I (Maximum Marks – 14)

Q. No.	Question	
5. (a)	Consider the figure:  Assume each base station uses 60 channels, regardless of cell size. If each original cell has a radius of 1 km and each microcell has a radius of 0.5 km, find the number of channels contained in a 3 km by 3 km square centered around A under the following conditions: (i) Without the use of microcells; (ii) When the lettered microcells as shown in figure are used; and (iii) If all the original base stations are replaced by microcells. Assume cells on the edge of the square to be contained within the square.	
(b)	Explain the working of mobile transaction recovery method.	3
6. (a)	List and explain the two basic performance metrics to measure the access efficiency and power conservation for a broadcast system.	4
(b)	Explain a distributed indexing technique, with a suitable example, for air indexing.	3

Section – II (Maximum Marks – 20)

7. (a)	Why hexagons are used to model the coverage areas? Explain the concept of frequency reuse.	5
(b)	Explain the concept of co-channel interference in a cellular network.	5
8. (a)	How the data transaction is being carried out in mobile environment? Explain it with a help of Kangaroo and Joey Transactions model.	5
(b)	What do you mean by Mobile database? Explain the various components of mobile database.	5
9. (a)	Write an algorithm to generate a broadcast disk. Explain the working of the algorithm with a suitable example.	5
(b)	What is an advantage of signature technique over Index tree technique? Explain the concept of hybrid index approach.	5

Winter Mid-Semester Examination, Session 2012-13

Examination & Semester: M.Tech (Computer Science & Engineering) II Semester

Subject: Advanced Computer Networks

Time: 2 Hours

Max. Marks: 60

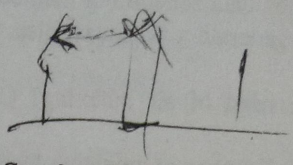
Instructions:

(a) Attempt all questions.

(b) Write the answers to the point.

Q. No.		Question	Marks
1.	(a)	Explain the role of the following parameter of IPv4 packet: Fragment Offset, and Protocol.	2
	(b)	Explain the purpose following the following addresses: Logical, Physical and Service.	2
	(c)	Many of the duties of the transport layer (e.g., flow control and reliable delivery) are also handled by the data link layer. Is this a duplication of effort? Why or why not?	2
	(d)	Write the need of following protocols: ARP, and DHCP.	2
	(e)	Compare TCP and UDP.	2
2.	(a)	Explain the channel assignment strategies used in cellular system.	4
	(b)	If a total of 33 MHz of bandwidth is allocated to a particular FDD cellular telephone system which uses two 25 kHz simplex channels to provide full duplex voice and control channels, compute the number of channels available per cell if system uses: (i) 4-cell reuse, (ii) 7-cell reuse, and (iii) 12-cell reuse If 1 MHz of the allocated spectrum is dedicated to control channels, determine an equitable distribution of control channels and voice channels in each cell for each of the three systems.	6
3.	(a)	Explain the various techniques used to improve the coverage and capacity in cellular systems.	4
	(b)	If a signal-to-interference ratio of 15 dB is required for satisfactory forward channel performance of a cellular system, what is the frequency reuse factor and cluster size that should be used for maximum capacity if the path loss exponent is (i) n =4, and (ii) n = 3. Assume that there are six co-channel cells in the first tier, and all of them are at the same distance from the mobile. Use suitable approximations.	6
4.	(a)	Explain the various constraints of Mobile computing.	4
	(b)	Create a small dynamic topology and explain the working of DSDV with a help of a routing table, sequence numbers and link breaks. What kinds of table updates are exchanged when a single node moves away from its neighbors? What are the associated values of the weight of a broken link and the generated sequence number?	6
5.	(a)	What is AODV? What does it stand for? What are the forward and reverse paths? When and how are they created? Explain with a suitable example.	4
	(b)	What is Direct Sequence Spread Spectrum Technology? How does it work in CDMA technology?	6
6.	(a)	Draw and explain the GSM Architecture.	4
	(b)	Explain the location tracking and call setup procedure of GSM network.	6

environment



Winter Semester Examination, Session 2012-13

Examination & Semester: **M.Tech (Computer Science & Engineering) II Semester**
Subject: **Advanced Computer Networks**
Instructions:

(a) Attempt any FIVE questions.
(b) Answer the questions serially and to the point.

Time: **3 Hours**
Max. Marks: **100**

Q. No.	Question	Marks
1. (a)	Consider building a CSMA/CD networks running at 1 Gbps over a 1-km cable with no repeaters. The signal speed in the cable is 200,000 km/sec. What is the minimum frame size?	4
(b)	Consider an IP packet having TL field = 4000B. Let MTU = 1024B. Propose a fragmentation scheme to fragment this packet. What will be the possible values of flags, offset fields after fragmentation? Consider the IP header size as min i.e., 20B.	4
(c)	What is the need of subnet masking? Indian School of Mines is granted the site address 201.70.64.0 (Class C). The School needs six subnets for individual departments. As a Network Administrator, design the required subnets. Find the range of addresses in each subnet.	4
(d)	What are Hidden terminal problem and Expose terminal problem in wireless communication? Explain it with proper diagram.	4
(e)	Explain in brief the mechanism of Request-To-Send (RTS) / Clear-To-Send (CTS). Give a brief idea about CSMA/CA protocol.	4
2. (a)	What is Direct Sequence Spread Spectrum Technology? How does it work in CDMA technology?	6
(b)	If a total of 33 MHz of bandwidth is allocated to a particular FDD cellular telephone system which uses two 25 kHz simplex channels to provide full duplex voice and control channels, compute the number of channels available per cell if system uses: (i) 4-cell reuse, (ii) 7-cell reuse, and (iii) 12-cell reuse If 1 MHz of the allocated spectrum is dedicated to control channels, determine an equitable distribution of control channels and voice channels in each cell for each of the three systems.	6
(c)	Explain the various techniques used to improve the coverage and capacity in cellular systems.	4
(d)	Explain the channel assignment strategies used in cellular system.	4
3. (a)	If a signal-to-interference ratio of 15 dB is required for satisfactory forward channel performance of a cellular system, what is the frequency reuse factor and cluster size that should be used for maximum capacity if the path loss exponent is (i) n =4, and (ii) n = 3. Assume that there are six co-channel cells in the first tier, and all of them are at the same distance from the mobile. Use suitable approximations.	6
(b)	Explain how tunneling works in general and especially for mobile IP using IP-in-IP, minimal, and generic routing encapsulation, respectively.	6
(c)	Give reasons for a handover in GSM and the problems associated with it. What are the typical steps for handover, what types of handover can occur?	4
(d)	List and explain the two basic performance metrics to measure the access efficiency and power conservation for a broadcast system. Suggest the ways to design an efficient broadcast system.	4

4. (a)	List the various data scheduling methods used in push-based broadcast techniques. Write an algorithm to generate a broadcast disk. Explain the working of the algorithm with a suitable example.	6
(b)	What is the need of air indexing? Compare and contrast the various index distribution algorithms.	6
(c)	What is an advantage of signature technique over Index tree technique? List and explain the types of signature algorithms.	4
(d)	Give an overview of Coda File System. How cache coherence is maintained in coda?	4
5. (a)	What is a hello packet in AODV? Is it a broadcast or a unicast packet? Give the format for hello packet. Which types of nodes are allowed to do hello? Why is hello required? At which rate does a node transmit a hello packet? When does a node remove its neighbour's entry?	6
(b)	Create a small dynamic topology and explain the working of DSDV with a help of a routing table, sequence numbers and link breaks. What kinds of table updates are exchanged when a single node moves away from its neighbors? What are the associated values of the weight of a broken link and the generated sequence number?	6
(c)	What is AODV? What does it stand for? What are the forward and reverse paths? When and how are they created? Explain with a suitable example.	4
(d)	What is a gateway in Cluster-Head Gateway Switch Routing (CGSR) Protocol? What are the advantages and disadvantages of CGSR protocol?	4
6. (a)	Explain the Dynamic Source Routing (DSR) protocol with proper diagram. What are the advantages and disadvantages of DSR?	6
(b)	How a client can continue to operate while being disconnected, even if disconnection lasts for hours or days?	6
(c)	How the data transaction is being carried out in mobile environment? Explain it with a help of Kangaroo and Joey Transactions model.	4
(d)	List and explain the various protocols used for Mobile commerce.	4
7. (a)	Explain the various constraints of Mobile computing.	4
(b)	What is the difference between CSMA/CD and CSMA/CA? Why CSMA/CD is not used in wireless communication?	4
(c)	Explain the location tracking and call setup procedure of GSM network.	4
(d)	What are the responsibilities of a routing protocol? What are the problems of routing in ad hoc wireless network?	4
(e)	Explain a method of accommodating file sharing in coda.	4

4. (a)	List the various data scheduling methods used in push-based broadcast techniques. Write an algorithm to generate a broadcast disk. Explain the working of the algorithm with a suitable example.	6
(b)	What is the need of air indexing? Compare and contrast the various index distribution algorithms.	6
(c)	What is an advantage of signature technique over Index tree technique? List and explain the types of signature algorithms.	4
(d)	Give an overview of Coda File System. How cache coherence is maintained in coda?	4
5. (a)	What is a hello packet in AODV? Is it a broadcast or a unicast packet? Give the format for hello packet. Which types of nodes are allowed to do hello? Why is hello required? At which rate does a node transmit a hello packet? When does a node remove its neighbour's entry?	6
(b)	Create a small dynamic topology and explain the working of DSDV with a help of a routing table, sequence numbers and link breaks. What kinds of table updates are exchanged when a single node moves away from its neighbors? What are the associated values of the weight of a broken link and the generated sequence number?	6
(c)	What is AODV? What does it stand for? What are the forward and reverse paths? When and how are they created? Explain with a suitable example.	4
(d)	What is a gateway in Cluster-Head Gateway Switch Routing (CGSR) Protocol? What are the advantages and disadvantages of CGSR protocol?	4
6. (a)	Explain the Dynamic Source Routing (DSR) protocol with proper diagram. What are the advantages and disadvantages of DSR?	6
(b)	How a client can continue to operate while being disconnected, even if disconnection lasts for hours or days?	6
(c)	How the data transaction is being carried out in mobile environment? Explain it with a help of Kangaroo and Joey Transactions model.	4
(d)	List and explain the various protocols used for Mobile commerce.	4
7. (a)	Explain the various constraints of Mobile computing.	4
(b)	What is the difference between CSMA/CD and CSMA/CA? Why CSMA/CD is not used in wireless communication?	4
(c)	Explain the location tracking and call setup procedure of GSM network.	4
(d)	What are the responsibilities of a routing protocol? What are the problems of routing in ad hoc wireless network?	4
(e)	Explain a method of accommodating file sharing in coda.	4

Department of Computer Science and Engineering
Mid Semester (Winter) Special Examination
II Semester M.Tech CSE
Advanced Computer Networks (CSC52102)

Full Marks: 30 Time: 2 Hrs.

Instruction: Write answers to the point.

1. (a)	Discuss the advantages of IPv6.	4
(b)	What is SIM? Discuss the components of Base Station Subsystem (BSS) in GSM?	6
2. (a)	What are the mobile computing functions?	3
(b)	What are the functions of Network Layer in OSI model?	3
(c)	Define Mobility Agent. What is the procedure for agent discovery in MobileIP?	4
3. (a)	Write the route update procedure in DSDV protocol with example.	6
(b)	Draw the WAP architecture.	4

Department of Computer Science and Engineering
Mid Semester (Winter) Special Examination
II Semester M.Tech CSE
Advanced Computer Networks (CSC52102)

Full Marks: 30 Time: 2 Hrs.

Instruction: Write answers to the point.

1.		
(a)	Discuss the advantages of IPv6.	4
(b)	What is SIM? Discuss the components of Base Station Subsystem (BSS) in GSM?	6
2.		
(a)	What are the mobile computing functions?	3
(b)	What are the functions of Network Layer in OSI model?	3
(c)	Define Mobility Agent. What is the procedure for agent discovery in MobileIP?	4
3.		
(a)	Write the route update procedure in DSDV protocol with example.	6
(b)	Draw the WAP architecture.	4