KADI SARVA VISHWAVIDYALAYA
B.E.SEMESTER 7th EXAMINATION NOVEMBER-2016

SUBJECT CODE: EC-702
SUBJECT NAME : Wireless & Mobile communication
DATE: 10.11.16 **TIME:** 10:30 to 1:30 **TOTAL MARKS: 70**

Instructions:
1. Answer Each Section in Separate Answer sheet.
2. Use of Scientific Calculator is permitted.
3. All questions are compulsory.
4. Indicate **clearly**, the options you attempted along with its respective question number.
5. Use the last page of supplementary for rough work.

Section -1

Q-1 A.	With respect to mobile networks, explain co channel and adjacent channel interference	5
B.	Describe RAKE receiver in CDMA	5
C.	Define the following terms regarding wireless communication: (1) Control channel (2) Half duplex channel (3) Base station (4) Mobile Switching Center (5) Reverse channel	5
	OR	
C.	Explain the concept of Cell splitting in detail with figure.	5
Q-2 A.	Describe in details GSM architecture with necessary block diagram and its various blocks	5
	OR	
A	Describe: Time Division Multiple Access (TDMA) in detail. Write the equation for efficiency of TDMA and The number of channels in TDMA system.	5
B.	Write short note on Code Division Multiple Access (CDMA).	5
	OR	
B.	Write short note on Frequency Division Multiple Access (FDMA).	5
Q-3 A.	What is fading? List and explain various types of small scale fading.	5
	OR	
A	What is hand over in GSM? Give comparison of hard hand over and soft hand over	5
B.	What is ZigBee ? Explain in details ZigBee networks.	5
	OR	
B.	Compare Wi Fi and Wi Max technologies.	5

Section -2

Q-4 A. Describe evolution of 1G, 2G and 3G mobile phone systems 5

B. Describe GPRS system architecture. 5

C. With necessary equations explain Free space propagation model in detail. 5

OR

C. Describe empirical formula for path loss in mobile networks 5

Q-5 A. With the help of timing parameters, explain frame structure for GSM. 5

OR

A Match the following terms with its most appropriate function/use 5

Term	Function/Use
VLR	Stolen phone numbers
HLR	Networks and country codes
EIR	Current location of the subscriber
MSC	Verification of the SIM
IMSI	Identity of an user
SIM	Temporary storage
AuC	Handover

B. Compare GSM, IS-136 and IS-95 standards in terms of modulation schemes, multiple access schemes, frequencies used, physical channel bandwidth, number of users/ physical channel and typical power radiated by mobile stations using these standards. Give your answer in tabulated form. 5

OR

B. With the aid of block diagrams, explain in detail the IS-95 CDMA forward and reverse channels. 5

Q-6 A. Give the difference between Circuits switching data service and Packet switch data service on cellular Networks. 5

OR

A Explain the concept of sectoring in detail with figure. 5

B. For a regular hexagonal geometry show that co-channel reuse ratio is $Q = (3N)1/2$, where $N = i2+ij+j2$. 5

OR

B. Write a short note on mobile portability 5

Seat No.: _____ Enrolment No._____

KADI SARVA VISHWAVIDYALAYA

BE EC SEMESTER 7TH EXAMINATION – NOVEMBER 2015

SUBJECT CODE: EC-702 **SUBJECT NAME: Wireless & Mobile communication**

DATE: 24/11 /2015 **TIME: 10.30 to 01.30** **TOTAL MARKS: 70**

Instructions:

1. Answer each section in separate answer sheet.
2. Use of scientific calculator is permitted.
3. Attempt all questions.
4. Indicate **clearly,** the option you may attempted along with its respective question number
5. Use the last page of main supplementary for rough work.

SECTION - 1

Q.1	**(a)**	Explain the Wireless Local Loop (WLL).	**05**
	(b)	Define following terms, 1.) Control Channel, 2.) Forward Channel, 3.) Reverse Channel, 4.) Half Duplex Channel, 5.) Soft Handoff.	**05**
	(c)	Write the difference between 1G, 2G and 3G cellular networks.	**05**
		OR	
	(c)	Explain in details the third generation 3G CDMA (UMTS) wireless network standard.	**05**
Q.2	**(a)**	The (FDMA) system has allocated total spectrum of 12.5 MHz and Guard band of 10 KHz with 30 KHz Channel bandwidth. Find (a) Number of Channel available for Data transmission (b) Frame Efficiency of FDMA system for 26 control channels.	**05**
	(b)	Explain in detail the time division multiple access with its key features and comments on the efficiency of TDMA.	**05**
		OR	
	(a)	What is a non linear effect in FDMA? Explain OFDM with neat diagram.	**05**
	(b)	A mobile is located 5 km away from a base station and uses a vertical $\lambda/4$ monopole antenna with a gain of 2.55 dB to receive cellular radio signals. The E- field at 1 km from the transmitter is measured to be 10 -3 V/M. The carrier frequency used for this system is 900 MHz.	**05**
Q.3	**(a)**	What is frequency reuse concept and what is foot print of cell. Explain the difference between co-channel interference and adjacent channel interference.	**05**
	(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 channel available per cell if a system uses (a) four-cell reuse ,(b) seven-cell reuse , and (c) 12 –cell reuse. If 1MHZ of the allocated spectrum is dedicated to control channels, determine an equitable distribution of control channels and voice channels in each for each of the three systems.	**05**
		OR	
	(a)	Prove that the co-channel reuse ratio is given by $$Q = \sqrt{3N}$$ where $N = i^2 + ij + j^2$ (Use cosine law & hexagonal geometry)	**05**
	(b)	Explain the difference between cell splitting and sectoring.A FDD cellular communication system uses a total of 945 radio channels available for handling traffic. The total area of the entire system is 2450 km^2 with the 7 km^2 as the area of a cell. Calculate the system capacity if the cluster size is 7.	**05**

		SECTION - 2	
Q.4	(a)	What is large scale propagation? Explain in detail the free space propagation model.	05
	(b)	Explain in detail the impulse response model of a multipath channel.	05
	(c)	If a transmitter produces 50 Watt of power, express the transmitter power in units of (a) dBm (b) dBw. If 50 W is applied to a unity gain antenna with a 90 MHz carrier frequency, find the received power in dBm at a free space distance of 100 meters from the antenna. What is Pr (at 10 Km)? Assume unity gain for the receiver antenna.	05
		OR	05
	(c)	Explain in detail the frequency domain channel sounding.	05
Q.5	(a)	Explain Architecture of GSM in detail also Draw frame format for a normal burst.	05
	(b)	Explain in detail the CDMA (IS-95) forward channel operation. Explain in detail RAKE receiver with neat diagram.	05
		OR	
	(a)	Explain in detail the types of small scale fading (including time delay and Doppler spread).	05
	(b)	Write a short note on physical factors influencing of small-scale fading.	05
Q.6	(a)	Explain in detail the wireless Ad-Hoc network.	05
	(b)	Write a short note on ZigBee Network.	05
		OR	05
	(a)	Write a short note on Direct RF Pulse system (for a small scale Multipath measurement)	05
	(b)	Compare Wi-Fi and Wi-MAX system parameters.	05

*****ALL THE BEST*****