QPC: RN18001198 AR - 18 Reg. No. | | | | | | | | | | |

GIET MAIN CAMPUS AUTONOMOUS GUNUPUR – 765022

B. Tech Degree Examinations, November – 2021

(Seventh Semester)

BECPE7021 – MOBILE COMMUNICATION

(E.C.E)

Time: 3 hrs Maximum: 100 Marks

Answer ALL Questions

The figures in the right hand margin indicate marks.

PART – A: (Multiple Choice Questions) (2 x 10 = 20 Marks)

Q.1. Answer ***ALL*** questions		[CO#]	[PO#]
a.	The early FM push-to-talk telephone systems were used in (i)Simplex mode (ii) Half duplex mode (iii) Full duplex mode (iv) None of the above	CO1	PO1
b.	Bluetooth operates in ___ ISM band and has a bandwidth approximately___. (i) 2.4 MHz, 100 Mbps (ii) 2.4 GHz, 1-3 Mbps (iii) 1.4 GHz, 1000Mbps (iv) 2.4 KHz, 100 Mbps	CO4	PO1
c.	Commonly used mode for 3G networks is (i)TDMA (ii)FDMA (iii)TDD (iv)FDD	CO1	PO1
d.	The shape of the cellular region for maximum radio coverage is (i) Circular (ii)Square (iii)Oval (iv)Hexagon	CO1	PO1
e.	Spectrum Efficiency of a cellular network is (i) The traffic carried by whole network (ii) The traffic carried per cell divided by the bandwidth of the system and the area of a cell (iii) Expressed in Erlang /MHz /km2 (iv) Both (ii) and (iii)	CO1	PO1
f.	The range of the WI-FI is around _____ (i) 50 meters (ii) 60 meters (iii) 70 meters (iv) 80 meters	CO4	PO1
g.	The techniques used to improve the capacity of cellular systems are (i) Splitting (ii) Sectoring (iii) Coverage zone approach (iv) All of the above	CO1	PO1
h.	Doppler spread refers to (i) Signal fading due to Doppler shift in the channel (ii) Temporary failure of message transfer (iii) Large coherence time of the channel as compared to the delay constraints (iv) All of the above	CO2	PO1
i.	In time diversity (iii) Signal is transmitted with different polarization (ii) The signal is transmitted using multiple channels (iii) Signal is transmitted with different polarization (iv) All of the above	CO3	PO1
j.	GSM is an example of (i) TDMA cellular systems (ii) FDMA cellular systems (iii) CDMA cellular systems (iv) SDMA cellular systems	CO1	PO1

PART – B: (Short Answer Questions) (2 x 10 = 20 Marks)

Q.2. Answer ***ALL*** questions		[CO#]	[PO#]
a.	Write types of channel assignment strategies.	CO1	PO1
b.	Define fast fading channel.	CO2	PO1

c.	Write the formula for co-channel reuse ratio.	CO1	PO2
d.	List any four advantages of third generation (3G) mobile networks.	CO1	PO1
e.	What is near and far effect?	CO3	PO1
f.	Differentiate hard and soft handoff.	CO1	PO1
g.	What is call blocking and termination?	CO1	PO1
h.	List the advantages of WLANs.	CO1	PO1
i.	Write down the features of Bluetooth.	CO4	PO1
j.	Draw the frame structure of TDMA system.	CO3	PO1

PART – C: (Long Answer Questions) **(15 x 4 = 60 Marks)**

Answer ***ALL*** questions

		Marks	[CO#]	[PO#]
3. a.	What are the techniques used to expand the capacity of a cellular system? Explain any two	8	CO1	PO1
b.	Write the advantages and disadvantages of 1G and 2G cellular systems.	7	CO1	PO1
	(OR)			
c.	What would results if handoff strategies involved in cellular systems. Explain in detail.	10	CO1	PO1
d.	Explain about soft hand off.	5	CO1	PO1
4. a.	Explain Cell splitting and Cell sectoring in cellular system.	10	CO1	PO1
b.	Write short notes on Bluetooth.	5	CO4	PO1
	(OR)			
c.	Write short notes on: i) space diversity ii) Time diversity	8	CO3	PO1
d.	Explain the channel assignment to the mobile units in details.	7	CO1	PO1
5. a.	What is the need of Frequency reuse? Prove that for a hexagonal geometry the co-channel reuse ratio is $(3N)^{1/2}$ where $N=i^2+ij+j^{2.}$	10	CO1	PO2
b.	Determine the number of cells in cluster for the following values of the shift Parameters i and j in a regular hexagon geometry pattern: (i) i=2 and j=4 (ii) i=3 and j=3	5	CO1	PO3
	(OR)			
c.	Define EIRP. Assume if a transmitter produces 50W of power, express the transmit power in units of dBm and dBW. If 50W is applied to a unity gain antenna with a 900 MHz carrier frequency, find the received power in dBm at a free space distance of 100m from the antenna also justify the analytical expression by computing the the received power at 10km.	15	CO2	PO3
6. a.	Summarize the features of various multiple access technique used in wireless mobile communication and also state the advantages and disadvantages of multiple access techniques.		CO3	PO1
b.	Compile the important features of Microcell zone concept		CO1	PO1
	(OR)			
c.	Write the features of forward and reverse channel.		CO1	PO1
d.	A hexagonal cell within a four cell system has a radius of 1.387km. A total of 60 channels are used within the entire system. If the load per user is 0.029 Erlangs, and λ=1 call/hour, compute the following for an Erlang C system that has a 5% probability of a delayed call and determine the following, (i) How many users per square kilometre will this system support? (ii) What is the probability that a delayed call will have to wait for more than 10sec? (iii) What is the probability that a call will be delayed for more than 10sec?		CO1	PO3

--- End of Paper ---