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Invigilator's Signature :	

CS/B.TECH/EIE/SEM-8/EC-802D/2013 2013 MOBILE COMMUNICATIONS

Time Allotted : 3 Hours

Full Marks : 70

The figures in the margin indicate full marks. Candidates are required to give their answers in their own words as far as practicable.

GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for any *ten* of the following :

 $10 \times 1 = 10$

i) Near-far problem occurs in	
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- a) TDMA b) CDMA
 - c) FDMA d) CSMA.
- ii) The first generation mobile cellular system is
 - a) GSM b) AMPS
 - c) IS-95 d) Pagers.
- iii) A single frame in GSM frame structure consists of
 - a) 10 time slots b) 8 time slots
 - c) 7 time slots d) 4 time slots.

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CS/B.TECH/EIE/SEM-8/EC-802D/2013 A cordless telephone operates with one iv) UPS b) **Fixed** port a) Standby processor. d) c) **Protection circuit** The visitors' nodes in mobile communication are v) registered in HLR b) EIR a) VLR d) AUC. c) The indoor propagation model takes care of vi) losses due to indoor antennas a) losses due to walls b) losses due to other wireless equipment c) losses due to active devices operating in ISM d) band. vii) FDMA is used in AMPS b) GSM a) both (a) and (b) d) none of these. c) viii) Ad-hoc networks are examples of which type of networks? Fixed and wired b) Mobile and wired a) Mobile and wireless. c) Fixed and wireless d) Wireless control message protocol (WDCP) is the ix) component of Session layer **Transport** layer a) b) **Application layer** d) Security layer. c) The DECT operation frequency band is x) a) (1880-1900) MHz b) (1650-1800) MHz (3-4) GHz. c) (2.5-3.5) MHz d) Which satellite has a distance of 36,000 km from the xi) centre of the earth? GEO MEO a) b) LEO d) HEO. c) The bandwidth requirement for Bluetooth is xii) 5 GHz d) 2.4 GHza) 2.7 GHz None of these. c) d)

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- 2. What do you mean by Co-channel cell ? What is the procedure to locate the co-channel cells ? Explain in brief.
- 3. If a signal-to-interference ratio of 15dB is required for satisfactory forward channel performance of a cellular system, what is requency reuse factor and cluster size that should be used for maximum capacity if the path loss exponent is (a) n = 4, 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 approximation.
- 4. What do you mean by Spread Spectrum modulation?
- 5. What is ISM band and what are its advantages ?
- 6. What is sub-satellite point ? What is the visibility condition of a satellite ?

GROUP – **C**

(Long Answer Type Questions)

		Answer any <i>three</i> of the following.	$3 \times 15 = 45$
7.	a)	Draw and explain GSM architecture.	7
	b)	Explain the signal processing technique in	GSM. 6
	c)	Write down the name of the different cha	nnels used in
		GSM.	2
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8.	a)	What is Fresnel zone ? How is it related to the path loss of radio wave transmission ?
	b)	Explain the concept of Okumura propagation model as applicable to the PCS. 5
	c)	Define hand-off with suitable diagram ? What is frequency reuse factor ? 5
	d)	Explain the term EIRP. 2
9.	a)	In packet radio multiple access technique, explain with a schematic, how Vulnerable proiod is set? How do we measure throughput of the system? $4 + 2$
	b)	Explain with the timing diagram how a cellular telephone call is made.
	c)	What are the major highlights and the concept of 3G network?
10.	a)	What is PCN ? Which one is better for PCN-circuitswitching or Packet Switching and why ? $1 + 2$
	b)	Draw and explain the cellular packet switched architecture for a metropolitan area Network. 5
	c)	Draw and explain the function of the Trunk interface unit and wireless interface unit of cellular packet switched architecture. 7
11.	Writ	te short notes on any <i>three</i> of the following : 3×5
	a)	GPRS
	b)	AMPS
	c)	Bluetooth

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- d) Mobile Computing
- e) Wireless LAN.

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