BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID SEMESTER EXAMINATION SP/2025)

CLASS: BTECH **SEMESTER : VI**
BRANCH: ECE **SESSION : SP/2025**

SUBJECT: EC373 MOBILE AND CELLULAR COMMUNICATION

TIME: 02 Hours **FULL MARKS: 25**

INSTRUCTIONS:
1. The question paper contains 5 questions each of 5 marks and total 25 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
***4*. Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates**

			CO	BL
Q.1(a)	With the help of suitable block diagram, explain the mechanism involved in establishing a call between two mobile users in a cellular system.	[2]	1	2
Q.1(b)	A cellular system has a total of 32 cells with radius of 1.6Km for each cells, using 7 cells in a cluster. It has been assigned a total of 336 duplex channels to handle the voice traffic. Find the number of channels per cell and state how many simultaneous calls are possible over the cellular system.	[3]	1	3
Q.2(a)	Compare GSM and EDGE communication system in terms of Architecture, protocols and performance.	[2]	1	3
Q.2(b)	Discuss Handoff in a cellular system. use power level consideration to explain the concept. Compare Soft Handoff and Hard Handoff.	[3]	1	2
Q.3(a)	Compare the concept of (i) Noise and Interference (ii) Co-channel and Adjacent channel Interference.	[2]	2	2
Q.3(b)	List various techniques to enhance cellular system capacity. Compare cell splitting and cell sectoring.	[3]	2	2
Q.4(a)	Explain the process of cell size rearrangement in a cluster. The small cell size help to enhance system capacity, justify	[2]	2	3
Q.4(b)	Discuss Power Control in CDMA system. A cellular system uses 7 cells in a cluster, where the path loss exponent is found to be 4. Find the Co-channel reuse factor.	[3]	2	3
Q.5(a)	Derive an expression for free space propagation model	[2]	3	2
Q.5(b)	Compare Okumura and Hata Model. A transmitter radiates 50 watt of power uniformly in all directions. Express the transmission power in units of dBw and dBm. Find the received power at a distance of 100 meter in free space in unit of dBm. Assume the frequency of operation is 900MHz.	[3]	3	3

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