B.E. (Electronics Engineering) Seventh Semester (C.B.S.)
Elective - I : Mobile Communication (BEENE705T)

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Notes : 1. All questions carry marks as indicated.
         2. Solve Question 1 OR Questions No. 2.
         3. Solve Question 3 OR Questions No. 4.
         4. Solve Question 5 OR Questions No. 6.
         5. Solve Question 7 OR Questions No. 8.
         6. Solve Question 9 OR Questions No. 10.
         7. Solve Question 11 OR Questions No. 12.
         8. Due credit will be given to neatness and adequate dimensions.
         9. Assume suitable data whenever necessary.
         10. Diagrams should be given whenever necessary.
         11. Use of non programmable calculator is permitted.

1. a) How a cellular Telephone call is made? Explain with diagram. **8**

  b) Explain channel assignment strategies in cellular communication system. **6**

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OR

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2. A certain city has an area of 1300 sq miles and is covered by a cellular system using a 7 cell reuse pattern. Each cell has radius of 4 miles and city is allocated 40MHz of spectrum will full duplex bandwidth of 60KHz. Assume a grade of service of 2% for Erlang B system is specified. If traffic user is 0.03 Erlangs. Compute the following : **14**
  i)   The number of cells in service area.
  ii)   The number of channels / cell.
  iii) The maximum carried traffic.
  iv)   Traffic intensity of each cell.
  v)   Total number of users that can be served for 2% GoS.
  vi)   Theoretical max. no of users that could be served at one time.

3. a) What are the different wide band channel sounding techniques in determining the small scale fading effects? Explain any one of them with block diagram. **6**

  b) For Rayleigh fading signal, compute the positive level crossing rate for $\rho = 1$, when the maximum Doppler frequency (fm) is 20Hz. What is the maximum velocity of the mobile to this doppler if the carrier frequency is 900 KHz? **7**

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OR

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4. a) Give the significance of following : **8**

  i)   Level crossing rate and Average duration fade.

  ii)   Delay Spread.

  iii) Coherence Bandwidth.

  iv)   Inter Symbol Interference.

  b) Find the far field distance for an antenna with maximum dimension of 1 meter and operating frequency of 900 MHz. **5**

5.	a)	Explain GMSK transmitter and receiver in detail.	**7**
	b)	Explain the salient features of QAM.	**6**

OR

6.	a)	Explain BPSK transmitter and receiver.	**7**
	b)	Explain $\pi/4$ QPSK transmission with the aid of following.	**6**
		i) $\pi/4$ QPSK transmitter.	
		ii) Constallation Diagram.	

7.	a)	What is Equalisation? Explain any one non – linear equalization technique.	**7**
	b)	Write a short note on : i) Polarisation diversity. ii) Frequency diversity. iii) Time diversity.	**7**

OR

8.	a)	Write a short note on fundamental of equalization.	**7**
	b)	Explain importance of Space diversity.	**7**
9.	a)	What is Duplexing? Explain types of duplexing with suitable example for each.	**6**
	b)	What are the features of FDMA?	**7**

OR

10.	a)	Write a short note on Spread Spectrum Multiple Access.	**7**
	b)	Write technical notes on "Space Division Multiple Access (SDMA)"	**6**
11.		Explain GSM mobile with following : i) GSM Services. ii) GSM System Architecture. iii) GSM air interface specifications.	**13**

OR

12.	a)	Give the structure of GSM slot, frame, multi frame, super frame and hyper frame.	**6**
	b)	Explain full Rate TCH.	**4**
	c)	If a normal GSM time slot consist of 6 trailing bits, 8.25 guard bits, 26 training bits and 2 traffic barsts of 58 bits of data. Find the frame efficiency.	**3**

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