



BE DEGREE EXAMINATIONS: APRIL 2018

(Regulation 2014)

Eighth Semester

ELECTRONICS AND COMMUNICATION ENGINEERING

U14ECTE51 : Mobile Communication

COURSE OUTCOMES

- CO1:** Discuss cellular radio concepts
CO2: Identify various propagation effects
CO3: Analyze various methodologies to improve the cellular capacity.
CO4: Classify multiple access techniques in mobile communication.
CO5: Outline cellular mobile communication standards

Time: Three Hours

Maximum Marks: 100

**Answer all the Questions:-
PART A (10 x 1 = 10 Marks)**

1. Match List I with List II

CO2 [K₃]

List I	List II
A. Flat Fading	i. BW of signal > BW of channel
B. Frequency Selective Fading	ii. Coherence time > symbol period
C. Fast Fading	iii. BW of signal < BW of channel
D. Slow fading	iv. Coherence time < symbol time

- | | A | B | C | D |
|----|-----|-----|-----|----|
| a) | iii | i | ii | iv |
| b) | i | iii | iv | ii |
| c) | iv | ii | iii | i |
| d) | iii | i | iv | ii |

2. Control channels are used for

CO1 [K₂]

- 1) Call setup
- 2) Transmitting of information from base station to mobile
- 3) Call initialization
- 4) Transmitting information from mobile to base station

Which of the following are true?

- | | |
|------------|----------|
| a) 1,2,3,4 | b) 1,3 |
| c) 2,4 | d) 1,2,3 |

3. Assertion (A): Adjacent channel interference can be minimized by proper channel assignment CO1 [K₂]

Reason (R): Interference between the signals with different frequency is called adjacent channel interference.

- a) both A and R are individually true and R is the correct explanation of A b) both A and R are individually true but R is not the correct explanation of A
- c) A is true but R is false d) A is false but R is true
4. ----- is defined as the ratio between the transmitter chip clock rate and the difference between the transmitter and receiver chip clock rates. CO3 [K₃]
- a) Actual propagation time. b) Slide factor
- c) Propagation delay d) Time dilation
5. Arrange the following steps in order if a call to a mobile user initiated by a landline subscriber. CO1 [K₃]
1. The MSC validates the request makes connection to the called party through the PSTN.
 2. The cell base station receives this data and sends it to the MSC.
 3. The mobile unit transmits the telephone number, Electronic serial number and the telephone number of the called party.
 4. A call initiation request is sent on the reverse control channel
- a) 4,3,1,2 b) 4,3,2,1
- c) 1,2,3,4 d) 4,2,3,1
6. Arrange the following steps in order of PLL operation for FM detection. CO4 [K₃]
1. Consists of a VCO with an output frequency which is varied in accordance with the demodulated output.
 2. The phase difference is then fed back to the VCO to control to output frequency.
 3. The output of the VCO is compared with the input signal using a phase comparator which produces an output voltage proportional to the phase difference.
 4. Once the VCO frequency is locked to the input frequency, the VCO continues to track the variations in the input frequency.
- a) 1,2,3,4 b) 1,4,3,2
- c) 3,2,1,4 d) 1,3,2,4
7. Match list I with list II and select the correct answer using the codes given below CO4 [K₂]

List I	List II
A. Switching network	1. Testing each transmitting channel.
B. Test frame	2. Allow the system to grow.
C. Executive cellular processor	3. interconnects local lines and trunks
D. Digital cellular switch	4. transports messages from one processor to another.

- a) 3 1 4 2 b) 4 1 2 3
- c) 3 4 1 2 d) 2 3 4 1
8. ----- controls the radiated energy for each user in space. CO4 [K₁]
- a) FDMA b) CDMA
- c) SDMA d) TDMA

9. Assertion (A): One of the main features of GSM is the subscriber identity module
Reason (R): It is a memory device that stores information such as the subscriber identification number, the networks and countries where the subscriber is entitled to service, privacy keys and other user specific information. CO5 [K₂]
- a) Both A and R are Individually true and R is the correct explanation of A b) Both A and R are Individually true but R is not the correct explanation of A
c) A is true but R is false d) A is false but R is true
10. In IS-95 CO5 [K₂]
1. Reverse link operation in the 824-849 MHz band and 869-894 MHz for the forward link.
 2. Orthogonality among all forward channel users within a cell is not preserved.
 3. A pilot channel is provided on the forward link.
 4. The speech coder used in the IS-95 system is the linear predictive coder.
- Which of the following are true?
- a) 3,4 b) 1,3
c) 1,2,3,4 d) 1,2

PART B (10 x 2 = 20 Marks)
(Answer not more than 40 words)

11. Compare fixed and dynamic channel allocation strategies. CO1 [K₃]
12. What is trunking? CO1 [K₂]
13. How is wired network different from wireless network? CO1 [K₂]
14. Draw the block diagram of the simulator using quadrature amplitude modulation with RF Doppler filter. CO2 [K₂]
15. Write the differences between the frequency management and channel assignment. CO3 [K₃]
16. What are the factors to be considered while selecting speech coder? CO3 [K₂]
17. List the various conditions where the crosstalk will occur. CO4 [K₁]
18. What are the two causes of near end and far end interference? CO4 [K₂]
19. Outline the network architecture of UMTS. CO5 [K₂]
20. What is Cognitive radio? CO5 [K₂]

Answer any FIVE Questions:-
PART C (5 x 14 = 70 Marks)
(Answer not more than 300 words)

Q.No. 21 is Compulsory

21. Analyze the various capacity improvement techniques in detail. CO1 [K₂]
22. Compare the various Propagation models in mobile communication. CO2 [K₃]
23. Discuss in detail the operational techniques and technologies in cellular mobile communication. CO3 [K₂]
24. Compare the various multiple access techniques. CO4 [K₂]

25. Write short notes on the following CO5 [K₂]
i) CDMA 2000.
ii) WCDMA
26. Explain the principle of cellular analog and digital switching equipment. CO3 [K₂]
27. Elaborate the linear predictive coders with suitable diagrams. CO2 [K₂]
