

Reg. No.

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B.E. / B.TECH. DEGREE EXAMINATIONS, MAY 2023

Fourth Semester

EC18604 – WIRELESS COMMUNICATION*(Electronics and Communication Engineering)***(Regulation 2018/2018A)****TIME: 3 HOURS****MAX. MARKS: 100**

COURSE OUTCOMES	STATEMENT	RBT LEVEL
CO 1	To characterize wireless channel and evaluate the various wave propagation models.	5
CO 2	To analyze various multiple-access techniques adopted in wireless applications and methodologies applied to increase the capacity of cellular system.	4
CO 3	To examine various digital signaling under fading conditions and calculate its error performance.	5
CO 4	To investigate various multipath mitigation techniques to retrieve signals under various channel conditions and evaluate its error probability.	4
CO 5	To be familiarize with wireless standards, generations and analyze its evolutions.	4

PART- A (10 x 2 = 20 Marks)

(Answer all Questions)

	CO	RBT LEVEL
1. Interpret the term Doppler shift with respect to wireless communication.	1	3
2. Differentiate fast and slow fading.	1	4
3. Why is the hexagon shape used to represent the shape of a cell?	2	4
4. How does the microcell zone concept improve the system capacity?	2	4
5. Give the function of the Gaussian filter in GMSK.	3	2
6. List out some PAPR reduction techniques.	3	2
7. Why are non-linear equalizers preferred? List out the non-linear equalization methods.	4	4
8. Analyze the folded frequency response of the channel in a zero-force algorithm.	4	4
9. Name the various interfaces used in GSM.	5	2
10. Mention the key features of WCDMA.	5	2

PART- B (5 x 14 = 70 Marks)

	Marks	CO	RBT LEVEL
11. (a) (i) Apply Doppler shift phenomenon for a mobile which moves with constant velocity.	(7)	1	3
(ii) Summarize the effects of fading with respect to symbol period and baseband signal bandwidth.	(7)	1	3

(OR)

(b) Derive the expression for electric field, received power and path loss for Two-ray model with required diagrams. **(14) 1 3**

12. (a) Apply the concept of blocked calls delay and blocked calls cleared system to measure the GoS in trunked system. **(14) 2 3**

(OR)

(b) (i) Discuss the impact of adjacent and co-channel interference in wireless communication. **(7) 2 3**

(ii) Discuss the techniques used to mitigate co-channel interference. **(7) 2 3**

13. (a) Deduce the expression for Bit error rate and power spectral density of GMSK. **(14) 3 4**

(OR)

(b) Access the principle of OFDM system and describe its operation with necessary block diagrams. **(14) 3 4**

14. (a) Describe the various types of diversity combining methods used in multipath propagation models. **(14) 4 2**

(OR)

(b) With relevant diagrams describe Rake receiver. Also explain how time diversity is achieved in CDMA using Rake receiver. **(14) 4 2**

15. (a) Analyze the features and services of GSM. Also explain the GSM system architecture with a neat sketch. **(14) 5 4**

(OR)

(b) (i) Examine the driving force which leads to the development of 5G. **(8) 5 4**

(ii) Deliberate the features of the LTE physical layer. **(6) 5 4**

PART- C (1 x 10 = 10 Marks)

(Q.No.16 is compulsory)

Marks CO RBT LEVEL

16. Evaluate the appropriate parameters of an OFDM system with an allocated bandwidth of 20 MHz and the size of FFT is 128. Also determine the change in subcarrier frequency spacing, data symbol duration and the total symbol duration, if the size of the FFT is reduced to half. **(10) 3 5**
