

# PRESIDENCY UNIVERSITY BENGALURU

## **SCHOOL OF ENGINEERING**

TEST - 1

Even Semester: 2018-19

Course Code: ECE 311

Time: 1 Hour

Course Name: Wireless Communication and Networks

Max Marks: 40

Date: 06 March 2019

Programme & Sem: B.Tech (VI & VIII) Sem

Weightage: 20%

#### Instructions:

(i) Read Questions carefully

(ii) All questions are compulsory

#### Part A

Answer all the Questions. Each question carries five marks.

(4Qx5M=20)

- 1. Identify the transmission mode in each case and define them:(a)WhatsApp video call between two friends (b)Army men using walkie-talkie (c)Listening to 98.1 Radio Mirchi in car.
- 2 Describe the limitations of wireless Networks.
- 3. Explain the impact of cluster size 'N' on channel capacity 'C' with and without interference in the system.
- 4. Read the analogy carefully. In a university, in each classroom, faculty controls 60 students, the head of the department monitors the faculties and they work as a team in department, the dean of university constantly monitors departmental heads and also acts as medium for communication between other universities and schools. If each classroom is considered to be a cell, identify how each component mentioned above is analogous to cellular system and describe their function in cellular system.

#### Part B

Answer both the Questions. Each question carries four marks.

(2Qx4M=8)

- 5. List the features of wired and wireless networks in a table.
- 6. On 15<sup>th</sup> August, the Government of India sent text to all the citizens, "Wishing everyone Happy 71<sup>st</sup> Independence Day. JAI HIND" Identify the wireless system used. Draw and explain its architecture.

## Part C

Answer **both** the Questions. **Each** question carries **six** marks.

(2Qx6M=12)

- 7. Batman has i-phone cell, he wants to call Joker on his one-plus cell. Explain how this call is established?
- 8. In a densely populated area like Koramangala, a large cell provides coverage over an area of 160 km² and supports 45 voice channels. If this larger cell is divided in to 7 smaller cells, where each cell supports 30% of total available channels. Compute the total capacity of the system, coverage area of each cell and frequency reuse factor for the area covered by large cell.



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# PRESIDENCY UNIVERSITY BENGALURU

# SCHOOL OF ENGINEERING

TEST - 2

Even Semester: 2018-19

**Date**: 16 April 2019

Course Code: ECE 311

Time: 1 Hour

Course Name: Wireless Communication and Networks

Max Marks: 40

Program & Sem: B.Tech & VI / VIII<sup>th</sup> Sem (DE) Group-I

Weightage: 20%

## Instructions:

(i) Read Questions carefully

(ii) All questions are compulsory

#### Part A

Answer all the Questions. Each question carries four marks.

(3Qx4M=12)

- 1. Identify the multiple access technique in each case and with the help of diagram define them: (a) A group of friends listening to Red FM 93.5 (b) An operator has been allotted frequency channel for entire period of time and customers can avail 2-way communication at regular intervals of time.
- 2. Define Hand-off. Explain different types of Hand-off.
- 3. What do you mean by Adjacent Channel Interference (ACI)? How it can be reduced?

#### Part B

Answer both the Questions. Each question carries eight marks.

(2Qx8M=16)

- 4. You are appointed as Lead Engineer to resolve issues in two different sites. Area 1: In Presidency University, network issues, call drop problems have increased due to Interference. Consider that university campus is a cell with a centre-excited antenna and the campus has segments: SOE, SOL and SOM, so the issue is common for all of them. Area 2: Shivajinagar turned out to be a densely populated area recently and operators are unable to manage the increased Traffic. Subcribers too face network issues and call drops. Suggest a solution for capacity enhancement in each case with suitable diagram.
- 5. Given codes are  $C_1$ =[-1,-1,-1],  $C_2$ = [1,-1,-1,1],  $C_3$ = [-1,1,1,1],  $C_4$ = [-1,1,1,-1], Considering these codes, Show that whether CDMA can be applied with these codes. Determine total no. of users in this system and give reason for your answer. Comment on capacity of CDMA. Why CDMA is called as Spread Spectrum Technology?

## Part C

Answer **both** the Questions. **Each** question carries **six** marks.

(2Qx6M=12)

- 6. (a) List the main features of FHSS.
  - (b) In AMPS, spectrum provided to operators is 15MHz for total no. of 428 channels and each channel between them is 35 KHz. Calculate Bandwidth allocated to guard band.
- 7. Joey is a big foodie. He is in India and travels places to discover different tastes of India. While travelling from Bangalore to Goa, he had to pass through an area with a cluster of 12 cells to reach border of Goa. Find co-channel reuse ratio and use this value to estimate SIR at the cell boundary. Assume path loss exponent to be 4.



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# PRESIDENCY UNIVERSITY BENGALURU

## SCHOOL OF ENGINEERING

## **END TERM FINAL EXAMINATION**

Even Semester: 2018-19

Date: 23 May 2019

Course Code: ECE 311

Time: 3 Hours

Max Marks: 80

Course Name: Wireless Communication and Networks
Program & Sem: B Tech & VI & VIII Sem

Weightage: 40%

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- (i) Answer all questions
- (ii) Read questions carefully

#### Part A

Answer all the Questions. Each question carries one mark. (20Qx1M=20M)1 I. In which multiple access technique, the frequency spectrum is divided among users. a. FDMA b. TDMA c. CDMA d. SDMA II. Specification of a wireless LAN standards a. 802.11 b.802.3 c. 802.3u d.802.3z III. Which are the different transmission modes available in wireless systems? a. Simplex b. Half Duplex c. Full Duplex d. All the three IV. Simulcasting is commonly used in which communication system? a. Cordless system b. Paging c. Cellular System d. All the three V. To identify a mobile equipment, which number is used? a. IMEI b. IMSI c. PIN d. None of These VI. Co-Channel Cells share set of frequencies. b. Different a. Same c. Orthogonal d. Similar VII. In a densely populated area, which type of cell enhancement technique is needed? a. Splitting b. Sectoring c. Repeater d. Microzone cell VIII. In which multiple access technique, the time is divided among users? a. FDMA b. TDMA c. CDMA d. SDMA IX. The different types of handoffs are: a. Soft b. Hard c. Softer d. All the three X. Broadcasting is an example of which transmission mode? a. Simplex b. Half Duplex c. Full Duplex d. None of These XI. Use of guard band can reduce which type channel Interference? a. ACI b. CCI c. SCI d. All XII. A base station sends signal to mobile equipment using channel. a. Forward b. Reverse c. Straight d. All XIII. The message sent in paging system is called? a. Page b. MSG d. SDMA c. message XIV. Shape of a cell in cellular system for maximum radio coverage? a. Circle b. Square c. Hexagon d. Pentagon

XV.	Handheld walkie-talkies a	ire example for	transmissio	n mode.			
	a. Simplex	b. Half Duplex	c. Full Duplex	d. None of These			
XVI.	In which cell capacity enh	nancement technique	ennas are replaced by				
	sectored antennas.						
	a. Splitting	b. Sectoring	c. Repeater	d. Microzone cell			
XVII.	/II. In TDMA is introduced to avoid interference.						
	a. Guard Period	b. Guard Band	c. Space	d. All			
XVIII.	Multiple users access technique.	the same chann	el air in wireless	communication using			
		b. Multiple Access	c. Queue	d. None of These			
XIX.	Splitting cells						
			c. has no effect	d. None of These			
XX.	X. One way communication is only possible intransmission mode.						
			c. Fullduplex				
		Part B					
	Anower all the Ougetions	Each question corri	ioo <b>fiyo</b> marks	(40×5M-20M)			
	Answer all the Questions	. <b>Lach</b> question cam	les live marks.	(4Qx5M=20M)			
2.	Explain call establishment in a cellular communication system with necessary steps.						
	Define handoff. Explain the process with the help of a neat diagram.						
	List any five features of Bluetooth						

- 4. List any five features of Bluetooth.
- 5. Differentiate adhoc mode from the infrastructure mode of WLAN.

## Part C

Answer all the Questions. Each question carries ten marks.

(4Qx10M=40M)

- 6. Name any 2G standard and explain the architecture of the standard with the help of a neat diagram.
- 7. Draw the OSI model of a network device and give the function of each layer.
- 8. Compare the major features of 1G, 2G, 3G and 4G standards.
- 9. Explain the architecture of GPRS with necessary diagrams.