Subject Name: Mobile Computing and Wireless Communication
Subject Code: 3170710

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Sr.No	CHAPTER NO - 1 : Introduction:	Marks
	TOPIC:1 Introduction Transmission Fundamentals	
	SHORT QUESTIONS	
1.	Consider Spectrum 3 MHz to 5 MHz, SNR given in decibel is 20, then find out levels. **[L.J.I.E.T]** a) 2 Levels b) 4 Levels c) 6 Levels d) 8 Levels e) 10 Levels f) 16 Levels **Ans: e) 10 levels**	1
2.	Which of the following are wireless media: **[L.J.I.E.T]** I. Twisted pair II. Radio Waves III. Coaxial Cable IV. Microwaves V. Magnetic tap VI. Infra red VII. Optical Fiber a) I,III,V and VII Only b) I,III and VII Only c) II,IV, V and VI Only d) II,IV and VI Only e) II, IV and V Only f) I, II and V Only **Ans: d) II,IV and VI Only**	1
3.	Consider Spectrum 3 MHz to 7 MHz, SNR given in decibel is 24, then find out levels. **[L.J.I.E.T]** a) 2 Levels b) 4 Levels c) 6 Levels d) 8 Levels e) 10 Levels f) 16 Levels **Ans: f) 16 Levels**	1
4.	Which of the following are not wireless media: **[L.J.I.E.T]** I. Twisted pair II. Radio Waves III. Coaxial Cable IV. Microwaves V. Magnetic tap	1

	VI. Infra-red VII. Optical Fiber a) I,III and VI only b) I,III,V and VII only c) II, IV and VI only d) I, III and VII only e) I, III,VI and VII only f) II,IV,V and VI only **Ans: b) I,III,V and VII only**	
5	Which one of the following statements justifies the following statement? **[L.J.I.E.T]** " Optical fibers are highly immune to EMI" a) They transmit signals in as light rather than electric current. b) They are readily shielded by outer conductors in cable. c) They are having proper Core and cladding structure d) They are too small for magnetic fields to introduce current in them. e) Magnetic fields cannot penetrate the glass of the fiber. **f)** None of them **Ans: a) They transmit signals in as light rather than electric current.**	1
6	Which of the following is not an advantage of Optical fiber cable **[L.J.I.E.T]** a) Immune to electromagnetic interference b) easy installation and maintenance c) Faster data transmission d) Less signal attenuation e) More security of data f) None of them **Ans: b) easy installation and maintenance**	1
7	Which of the following is not Characteristic of Digital signal? **[L.J.I.E.T]** a) It is discrete time signal generated by digital modulation b) No guarantee that processing can be done in real time and consume less bandwidth c) It observes more attenuation d) It is possible to separate noise and original signal e) It can be Stored in the form of binary data. f) The instruments draw negligible power to generate the signal. **Ans: b) No guarantee that processing can be done in real time and consume less bandwidth**	1
8	Which of the following is not Characteristic of Analog signal? **[L.J.I.E.T]** a) It is a Continuous signal b) It consumes less bandwidth c) It can be stored in form of wave signals d) The instruments draws larger power to generate this kind of signal e) The analog signals observes less attenuation f) It is possible to separate Noise and Original signals **Ans: f) It is possible to separate Noise and Original signals**	1
9.	Given two sine waves A and B , if the frequency of A is twice that of B, then the period of B is _____ that of A. **[L.J.I.E.T]**	1

	a) one-half b) twice c) the same as d) the square as e) indeterminate from f) None of them **Ans: b) twice**	
10	A sinwave is _____ **[L.J.I.E.T]** a) Periodic and continuous b) Aperiodic and continuous c) Periodic and discrete d) Aperiodic and discrete e) Anything can possible f) None of them **Ans: a) Periodic and continuous**	1
11	Which is the transmission media that can carry huge data to large distances with less delay or latency? **[L.J.I.E.T]** a) RF b) Microwave Frequency c) Coaxial Cables d) Optical Fiber Cables e) Twisted Pair Cables f) None of them **Ans: d) Optical Fiber Cables**	1
	DESCRIPTIVE QUESTIONS	
1.	Explain Signals for conveying information. **[L.J.I.E.T]**	7
2.	Explain Analog and Digital data transmission**[L.J.I.E.T]**	7
3.	Define: Peak Amplitude (*A*), Frequency (*f*) and Period (*T*). **(New_Nov_2017) [L.J.I.E.T]**	3
4.	What is the relationship between data rate and its bandwidth? **[L.J.I.E.T]**	7
5.	Define Channel Capacity. Define its key factors that affect it. **(New_Nov_2017) [L.J.I.E.T]** What do you mean by channel capacity? What are the factors that affect it? **(New_Nov_2018) [L.J.I.E.T]** What is channel capacity? What are the factors that affect it? **(New_Aug_2021) [L.J.I.E.T]**	3
6.	Define channel capacity. Write Shannon and Nyquist capacity formula. State the key factors that affect channel capacity.**(New_Nov_2016) [L.J.I.E.T]**	7
7.	Explain Nyquist theorem? Find the relationship among the following terms Channel Capacity (C), Bandwidth (B) and Signal-to-Noise Ratio (SNR)**. (New_May_2017) (New_May_2018)[L.J.I.E.T]**	7
8.	What is the Nyquist Theorem and Why Does it Matter? **(New_Nov_2019) [L.J.I.E.T]**	3
9.	Explain the Transmission Media. **(New_May_2018) [L.J.I.E.T]**	3
10.	Compare Guided and Unguided media with its applications. (**New_Nov_2019) [L.J.I.E.T]**	4
11.	What are Advantages and Disadvantages of Infrared? **(Old_Dec_2012) [L.J.I.E.T]**	3
12.	What is noise? Discuss briefly types of noise and its effect on transmission signal**. (New_Nov_2018) [L.J.I.E.T] (New_Aug_2021) [L.J.I.E.T]**	4
13.	Explain various transmission media w.r.t. merit, demerits and application of each. **(New_Nov_2018) [L.J.I.E.T]**	4
14.	Why Multiplexing is needed in wireless communication and What is the use of Guard band in telecommunication networks? (**New_Nov_2019) [L.J.I.E.T]**	3

15.	Define channel capacity. Write Shannon capacity formula. **(New_Oct_2020) [L.J.I.E.T]** Define Channel capacity. What is Shannon's capacity formula for noisy channel? **(New_Jan_2021) [L.J.I.E.T]**	3
16.	State the key factors that affect channel capacity. **(New_Oct_2020) [L.J.I.E.T]**	4
17.	Classify Guided and Unguided media. Show the use of Guided media in real world. **(New_Jan_2021) [L.J.I.E.T]**	4
18.	Briefly describe the following networks with example and application 1. Wired network 2. Wireless network **(Old_May_2019) [L.J.I.E.T]**	7
	NUMERICALS	
1.	Given a channel with an intended capacity of 50 Mbps, the bandwidth of the Channel is 5 MHz. What signal-to-noise ratio is required to achieve this capacity? **[New](Nov-2016)[L.J.I.E.T] (New_Oct_2020) [L.J.I.E.T]**	3
2.	A typical voice channel has SNR as 30dB and Bandwidth as 2.7KHz. Calculate the approximate maximum information capacity of the channel? **(New_Nov_2019) [L.J.I.E.T]**	4
3.	We have a channel with a 1-MHz bandwidth. The SNR value for this channel is 63. What are the appropriate Bit rate and Signal level using Shannon's and Nyquist's Formula? **(New_Nov_2019) [L.J.I.E.T]**	4
	TOPIC 2. Communication	
	SHORT QUESTIONS	
1	In _____ Connection, the link between any two switches can also be used by other connection. **[L.J.I.E.T]** a) Circuit switching b) Message switching c) Bit Switching d) Virtual Circuit packet switching e) All of them **f)** None of them **Ans: d) Virtual Circuit packet switching**	1
2	What are the Methods to move data through a network of links and switches? **[L.J.I.E.T]** a) Packet switching and Line switching b) Circuit switching and Line switching c) Line switching and bit switching d) Packet switching and Circuit switching e) Message Switching and bit switching f) Message Switching and Line switching **Ans: d) Packet switching and Circuit switching**	1
3	A message from device A consists of packets X and packet Y. In the virtual circuit Approach to packet switching, Packet Y's path _____ Packet X's path. **[L.J.I.E.T]** a) Is the same as b) Is independent of c) Is dependent on d) Is always different from e) Is always same as f) None of them **Ans: b) Is independent of**	1
4	Which of the following device which can be used in LAN, MAN or WAN, receives a signal and,	1

	before it becomes too weak or corrupted, regenerates the original bit pattern. It then sends the refreshed signal. **[L.J.I.E.T]** a) Hub b) Repeater c) Bridge d) Router e) Gateway f) Switch **Ans: b) Repeater**	
5	A network Router device connects two or more ___ networks. **[L.J.I.E.T]** a) LAN b) MAN c) WAN d) Both LAN and MAN e) Both MAN and WAN f) All of them **Ans: f) All of them**	1
	DESCRIPTIVE QUESTIONS	
1.	Briefly describe the following networks with example and application: 1. Wired network 2. Wireless network 3. Ad hoc network **(Old_May_2015) [L.J.I.E.T]**	7
2.	Why is conventional routing in wired networks not suitable for wireless networks? Substantiate your answers with suitable examples. **(Old_Dec_2012) [L.J.I.E.T]**	4
3.	Explain LAN, WAN, MAN. **[L.J.I.E.T]** Compare the LAN and WAN. **(New_May_2018) [L.J.I.E.T]** Compare LAN, MAN and WAN with proper diagram. **(New_Jan_2021) [L.J.I.E.T]**	7
4.	Explain Circuit switching. **[L.J.I.E.T]**	7
5.	Write advantages and disadvantages of packet switching over circuit switching. **(New_Nov_2016)[L.J.I.E.T]**	7
6.	Differentiate: Circuit Switching and Packet Switching. **(New_Nov_2017) [L.J.I.E.T]** Differentiate circuit switching and packet switching. **(New_Nov_2018) [L.J.I.E.T]** Explain packet switching and circuit switching. **(New_May_2019) [L.J.I.E.T]** Differentiate packet switching and circuit switching **(New_Aug_2021) [L.J.I.E.T]**	4
7.	What is the circuit switching? Explain the communication phases of circuit switching. Differentiate between Datagram and Virtual circuit operation? **(New_May_2017) [L.J.I.E.T]**	7
8.	Describe the Switching Techniques. Differentiate the Circuit Switching and Packet Switching. **(New_May_2018) [L.J.I.E.T]**	7
9.	State the difference between Ad hoc and Infrastructure network **(New_Jan_2021) [L.J.I.E.T]**	3
	TOPIC 3. Protocols and the TCP/IP Suite	
	DESCRIPTIVE QUESTIONS	
1.	What is the need of protocol architecture? Explain TCP/IP protocol in brief. **[L.J.I.E.T]**	7
2.	Describe the TCP/IP Protocol Architecture. **(New_May_2018) [L.J.I.E.T]**	3
3.	Explain OSI model with function of each layer. List the name of layer which implemented the following Bridge, Gateway, and Repeater. **(New_May_2017) [L.J.I.E.T]**	7
4.	Compare: OSI Model and TCP/IP Protocol Architecture. **(New_Nov_2017) [L.J.I.E.T]**	4
5.	Why is UDP needed? Why can't user program directly access IP? **(New_Nov_2016) [L.J.I.E.T]**	7
6.	Compare and contrast OSI model and TCP/IP protocol architecture. **(New_Nov_2018) [L.J.I.E.T]**	7
7.	Explain the terms with respect to OSI Model : Frame , Packet & Segment. **(New_Nov_2019) [L.J.I.E.T]**	3

	CHAPTER NO – 2: Cellular Wireless Networks:	
	TOPIC 1. Cellular Wireless Networks	
	SHORT QUESTIONS	
1.	Which one is not an advantage of using frequency reuse? **[L.J.I.E.T]** I. Increased capacity II. Limited spectrum is required III. Same spectrum may be allocated to other network IV. Number of base stations is reduced a) I only b) II only c) III only d) IV only e) I and IV only **f)** II and III only **Ans: d) IV only**	1
2.	For radio coverage for a cell we use Hexagon cell Because **[L.J.I.E.T]** I. It uses the maximum area for coverage II. It gives Maximum Frequency range III. Fewer number of cells are required IV. It approximates circular radiation pattern a) I, II and III only b) I, II and IV only c) I, III and IV only d) II, III and IV only e) None of them f) All of them **Ans: c) I, III and IV only**	1
3	Why the size of the cell is kept small in cellular network? **[L.J.I.E.T]** I. Decrease capacity II. Increased size of base station electronics III. Slow process of handoffs IV. Increase Number of Base station a) I only b) II only c) III only d) IV only e) All of the them f) None of them **Ans: f) None of them**	1
4	2G standards support **[L.J.I.E.T]** I. Limited internet browsing II. Short Messaging Service III. high definition television	1

	IV. Video Conferencing a) I and II only b) I and III only c) II and III only2 d) III and IV only e) II and IV only f) II, III and IV only **Ans: a) I and II only**	
5	What is the full form of GPRS? **[L.J.I.E.T]** a) General Packet Radio Service b) General Packet Radio Switching c) GSM Packet Service d) GSM Packet Switching e) Global Packet Radio Service f) None of them **Ans: a) General Packet Radio Service**	1
6	In the Cellular Network, on which of the following, the cell's shape depends? **[L.J.I.E.T]** a) Political conditions b) Social Conditions c) Environment Condition d) Personal Condition e) None of them f) All of them **Ans: c) Environment Condition**	1
	DESCRIPTIVE QUESTIONS	
1.	Explain the differences between 1G, 2G, 2.5G and 3G mobile communications**.** **(Old_June_2012) [L.J.I.E.T]** What are the essential functional differences between 1st generation, 2nd generation and 3rd generation of networks? **(Old_May_2015) [L.J.I.E.T]**	7
2.	what are the essential functional differences between 1st generation, 2nd generation and 3rd generation of networks? **(Old_Dec_2012) [L.J.I.E.T]**	4
3.	Explain: 2G v/s 3G**. (Old_Dec_2015) [L.J.I.E.T]**	3.5
4.	Write short note on: 1G, 2G, 2.5G and 3G mobile communications**. (Old_Dec_2013) (Old_Dec_2018) [L.J.I.E.T]** Explain the 1G, 2G, 2.5G and 3G Mobile Communications. **(New_May_2018) [L.J.I.E.T]**	7
5.	Explain 3G networks. How is a 3G network different from a 2G CDMA network? **(Old_Dec_2016) [L.J.I.E.T]**	7
	TOPIC 2. Antennas and Propagation	
	SHORT QUESTIONS	
1	In which of the following modes of propagation the ionosphere acts as the reflecting Surface for the waves? **[L.J.I.E.T]** a) Ground Wave b) Sky Wave c) Space Wave d) LOS	1

	e) Radio Wave **f)** Infra-red Waves **Ans: b) Sky wave**	
2	After which phenomenon/phenomena do the waves arrive at the receiving antenna in ionospheric propagation? **[L.J.I.E.T]** a) Blocking or Shadowing b) Reflection or Scattering c) Refraction d) Defraction e) All of them **f)** None of them **Ans: b) Reflection and Scattering**	1
3	Which of the following is not a channel parameter? **[L.J.I.E.T]** a) Bandwidth b) Coherence time c) Rms delay spread d) Doppler spread e) All of the them f) None of them **Ans: a) Bandwidth**	1
4	In slow fading channel, Doppler spread of the channel is much less than the _____ of baseband signal. **[L.J.I.E.T] [L.J.I.E.T]** a) Symbol period b) Phase c) Coherence time d) Bandwidth e) All of them f) None of them **Ans: d) Bandwidth**	1
5	Which type of ground wave travels over the earth surface by acquiring direct path through air from transmitting to receiving antennas? **[L.J.I.E.T]** a) Surface wave b) Space wave c) Sky wave d) Both Surface & Space e) All of the above f) None of the above **Ans: b) Space wave**	1
6	Space wave propagates at which frequency band? **[L.J.I.E.T]** a) VHF b) HF c) MF d) LF e) VLF f) None of them **Ans: a) VHF**	1
7	By which name/s is an ionospheric propagation, also known as? **[L.J.I.E.T]** a) Sea wave propagation b) Ground wave propagation c) Sky wave propagation	1

	d) Space wave Propagation e) Line of sight Propagation f) All of them **Ans: c) Sky wave propagation**	
8	For fast fading channel, the coherence time of the channel is smaller than _____ of transmitted signal. **[L.J.I.E.T]** a) Doppler spread b) Bandwidth c) Symbol period d) Coherence bandwidth e) All of them f) None of them **Ans: c) Symbol period**	1
9	_____ leads to time dispersion and frequency selective fading. **[L.J.I.E.T]** a) Doppler spread b) Period delay spread c) Time dispersive parameters d) Frequency delay spread e) All of them f) None of them **Ans: f) None of them**	1
10	What is the nature of radiation pattern of an isotropic antenna? **[L.J.I.E.T]** a) Spherical b) Dough-nut c) Elliptical d) Hyperbolic e) Triangular f) None of them **Ans: a) Spherical**	1
	DESCRIPTIVE QUESTIONS	
1.	What is antennas? Explain types of antennas. **[L.J.I.E.T]**	7
2.	What is Antenna Gain? Explain with its formula **(New_Nov_2017) [L.J.I.E.T]**	3
3.	Explain different types of Propagation Mode. **(Old_Dec_2012) [L.J.I.E.T]**	7
4.	What are propagation modes? Explain free Space loss propagation modes in details? **(New_May_2017) [L.J.I.E.T]**	7
5.	What is wave propagation? Discuss various modes of propagation with example. **(New_Nov_2019) [L.J.I.E.T] (New_Oct_2020) [L.J.I.E.T]**	7
6.	Define Reflection, Refraction and diffraction. **(New_May_2019) [L.J.I.E.T]**	3
7.	Explain in brief LOS wireless transmission and its significant impairments. **[L.J.I.E.T]**	7
8.	What is Multipath propagation? What is dwell time? **(Old_Dec_2012) [L.J.I.E.T]**	3
9.	What is Multi-path propagation and fading? **(New_May_2019) [L.J.I.E.T]**	4
10.	What is fading? Differentiate **(New_Nov_2016) [L.J.I.E.T]** i. Fast and slow fading ii. Flat and selective fading.	7
11.	Explain the term Fading and its types in the Mobile Environment in detail. **(New_May_2018) [L.J.I.E.T]**	7
12.	Define following. 1) Fading **2)** Modulation **(New_Nov_2018) [L.J.I.E.T]**	3
13.	List and explain the types of antenna in wireless network with their applications. **(New_Jan_2021) [L.J.I.E.T]**	4
14.	Define Radio propagation. List and explain propagation modes. **(New_Jan_2021) [L.J.I.E.T]**	7

15.	Define Reflection, Refraction and Handover **(New_Aug_2021) [L.J.I.E.T]**	3
	TOPIC 3. Modulation Techniques	
	DESCRIPTIVE QUESTIONS	
1.	Explain ASK, FSK , PSK, QPSK in Detail. **[L.J.I.E.T]**	7
2.	Define ASK, FSK & PSK. **(New_Nov_2018) [L.J.I.E.T] (New_Aug_2021) [L.J.I.E.T]**	3
3.	Explain Delta Modulation with their Transmission and Reception block diagram? **(New_May_2017) (New_Nov_2017) [L.J.I.E.T]**	7
4.	Enlist and Explain the different Modulation Techniques in the signal theory. **(New_May_2018) [L.J.I.E.T]**	4
5.	What is the bandwidth efficiency for FSK, ASK, PSK and QPSK for a bit error rate of 10^{-7} on a channel with an SNR of 12 dB? **(New_Nov_2016) [L.J.I.E.T]**	7
6.	Differentiate Amplitude, Frequency and Phase Shift Keying in Digital Modulation with proper diagram. **(New_Nov_2019) [L.J.I.E.T]**	4
7.	Explain Amplitude shift keying(ASK), Frequency shift keying(FSK) and Phase shift keying(PSK) in digital-to-analog conversion. **(New_Jan_2021) [L.J.I.E.T]**	7
	TOPIC 4. Spread Spectrum	
	SHORT QUESTIONS	
1	Why spread spectrum technique is inefficient for a single user? **[L.J.I.E.T]** a) Large transmission bandwidth b) Small transmission bandwidth c) Fixed transmission bandwidth d) Fixed null bandwidth e) All of them **f)** None of them **Ans: a) Large transmission bandwidth**	1
2	What is co-relation between tb and td in fast FHSS? **[L.J.I.E.T]** a) tb == td b) tb != td c) tb > td d) tb < td e) All of them f) None of them **Ans: c) tb>td**	1
3	In a CDMA network, assume there are four stations A, B, C, and D with their chip sequences, shown in Fig. Four stations transmitting at the same time. Show the transmitted sequences S4 A: 00011011 B: 00101110 C: 01011100 D: 01000010 S4: A sent 1, B sent 1, c sent 0, D sent 1 **[L.J.I.E.T]** a) (-2, -2,0, -2, 0, -2, +2, 0)	1

	b) (-2, -2,0, -2, 0, -2, +4, 0) c) (-2, +2,0, -2, 0, -2, +4, 0) d) (-2, -2,0, -2, 0, +4, -2, 0) e) (-2, -2,0, -2, 0, -4, +2, 0) f) (0, -2,0, -2, 0, +2, +2, 0) **Ans: b) (-2, -2,0, -2, 0, -2, +4, 0)**	
4	In DSSS technique expands the bandwidth of a signal by replacing each data bit with (assume N no of bit is of Chipping sequence bit) **[L.J.I.E.T]** a) N+1 bit b) N-1 bit c) N bit d) N×1 bit e) N≥1 bit f) N≤1 bit **Ans: C) N bit**	1
5	What is co-relation between tb and td in Slow FHSS? **[L.J.I.E.T]** a) tb == td b) tb != td c) tb > td d) tb < td e) All of them f) None of them **Ans: d) tb < td**	1
6	In a CDMA network, assume there are four stations A, B, C, and D with their chip sequences, shown in Fig. Four stations transmitting at the same time. Show the transmitted sequences S4 A: 00011011 B: 00101110 C: 01011100 D: 01000010 S4: A sent 1, B sent 0, c sent 1, D sent 1 **[L.J.I.E.T]** a) (-2, +2, -4, +2, 0, -2, 0, 0) b) (0, +2, -4, +2, 0, -2, +4, 0) c) (-2, +2, 0, +2, +2, -2, 0, 0) d) (+2, -2, -4, +2, 0, -2, 0, 0) e) (-2, +2, +4, +2, +2, -2, +2, 0) f) (+2, +2, -4, +2, 0, -2, +4, -2) **Ans: a) (-2, +2, -4, +2, 0, -2, 0, 0)**	1
	DESCRIPTIVE QUESTIONS	
1.	What is spread spectrum technology? Compare it with narrow band. **(Old_June_2014) [L.J.I.E.T]**	7
2.	Explain various spreading techniques used in spread spectrum. **(Old_May_2017) [L.J.I.E.T]**	7

3.	Define spreading sequence. List different categories of spreading sequences. Explain Walsh code with example. **(New_Nov_2016) [L.J.I.E.T]**	7
4.	What is Walsh function? Explain it for CDMA orthogonal codes.**(Old_Dec_2013) (Old_May_2015) [L.J.I.E.T]**	7
5.	What is CDMA? Explain the orthogonal codes for it. **(New_Dec_2019) [L.J.I.E.T]**	7
6.	What is frequency hopping in spread spectrum? Explain TDMA in detail. **(Old_Dec_2015) [L.J.I.E.T]** Define frequency hopping in spread spectrum. Write Note on TDMA,FDMA,CDMA. **(Old_Nov_2011) (New_May_2018) [L.J.I.E.T]**	7
7.	Explain frequency hopping spread spectrum. **(New_May_2019) [L.J.I.E.T] (New_Oct_2020) [L.J.I.E.T]**	7
8.	Explain the Direct Sequence Spread Spectrum Techniques. **(Old_May_2013) [L.J.I.E.T]**	6
9.	Explain in detail Direct Sequence Spread Spectrum Techniques (DSSS). **(Old_Dec_2014) (Old_Dec_2013) (Old_May_2015) (New_Nov_2017) (New_May_2018) (Old_May_2018) [L.J.I.E.T]** Explain Direct sequence spread spectrum with example. **(Old_May_2015) [L.J.I.E.T] (New_Aug_2021)** What is direct sequence spread spectrum technology? Explain how it works in the CDMA technology? **(Old_Dec_2012)** (**Old_May_2013) (New_May_2017) (New_Nov_2018) [L.J.I.E.T]** Explain direct sequence spread spectrum **(Old_May_2019) [L.J.I.E.T]**	7
10.	What is CDMA technology? Explain the Direct Sequence Spread Spectrum Techniques. **(Old_Dec_2014) (Old_May_2016) (Old_Dec_2018) [L.J.I.E.T]** What is CDMA technology? Explain Direct Sequence Spread Spectrum **(New_Dec_2019) (Old_May_2019) [L.J.I.E.T]**	7
11.	Define FHSS. Discuss advantages and applications of FHSS. **(New_Nov_2019) [L.J.I.E.T]**	4
12.	What is DSSS? Explain CDMA chip sequence with example. **(Old_Dec_2013) [L.J.I.E.T]**	7
13.	What is multiplexing? Explain FDM and TDM in details with one example.**(New_May_2017) [L.J.I.E.T]**	7
14.	Define the term Multiplexing. Explain the FDM and TDM with one example each. **(New_May_2018) [L.J.I.E.T]** Define Multiplexing. Explain the FDM and TDM **(New_Aug_2021) [L.J.I.E.T]**	4
15.	Explain various signal multiplexing techniques. **(New_May_2019) [L.J.I.E.T]**	7
16.	What is Direct Sequence Spread Spectrum technology? **(New_Oct_2020) [L.J.I.E.T]**	3
17.	Explain any two various signal multiplexing techniques. **(New_Oct_2020) [L.J.I.E.T]**	4
18.	How DSSS does works in CDMA technology? **(New_Oct_2020) [L.J.I.E.T]**	4
19.	Define spreading sequence. **(New_Oct_2020) [L.J.I.E.T]**	3
20.	List different categories of spreading sequences. Explain Walsh code with example. **(New_Oct_2020) [L.J.I.E.T]**	4
	NUMERICALS	

1.	In a CDMA network, assume there are four stations A, B, C, and D with their chip sequences, shown in Fig. 1. Fig. 2 shows four cases of four stations transmitting at the same time. Show the transmitted sequences S1 to S4 and how DSSS does the recovery at receiver. **(Old_Dec_2013) [L.J.I.E.T]** A: 00011011 B: 00101110 C: 01011100 D: 01000010 Fig 1: bit sequence A B C D - - 1 - C sent 1 - 1 1 - B & C sent 1 1 0 - - A sent 1 & B sent 0 1 1 0 1 A sent 1, B sent 1, C sent 0 & D sent 1 Fig. 2 transmition details	7
2.	In a CDMA network, assume there are two stations A (chip sequence: 00011011) and E (chip sequence: 00101110). Figure-1 shows two cases of both stations transmitting at the same time. Show the transmitted sequences S1 and S2 and how DSSS does the recovery at receiver. **A E** 1 0 A sent 1 and B sent 0 0 - only A sent 0 (Figure-1) **(New_Nov_2016) [L.J.I.E.T]**	7
	TOPIC 5. Coding and Error Control	
	SHORT QUESTIONS	
1	Which data and parity bit combination is correct for an EVEN parity data transmission system? A) data = 1110 0000 parity = 1 B) data = 0100 1010 parity = 0 C) data = 0000 0000 parity = 0 D) data = 1111 1111 parity = 1 **[L.J.I.E.T]** a) A and B only b) B and C only c) C and D only d) A and C only e) B and D only **f)** None of these **Ans: d) A and C only**	1
2	Which data and parity bit combination is correct for an ODD parity data transmission system? A) data = 1110 0000 parity = 1 B) data = 0100 1010 parity = 0 C) data = 0000 0000 parity = 0 D) data = 1111 1111 parity = 1 **[L.J.I.E.T]** a) A and B only	1

	b) B and C only c) C and D only d) A and D only e) B and D only f) C and A only **Ans: e) B and D only**	
3	A bit stream 1010101010 is transmitted using the standard CRC method, The generator polynomial encoded sequence is 10011. Then Give the CRC value. **[L.J.I.E.T]** a) 0100 b) 0000 c) 0110 d) 1110 e) 1010 f) 1011 **Ans: a) 0100**	1
4	What will be the checksum value for following bit sequence transmission? 10011001 11000010 00100100 10100100 **[L.J.I.E.T]** a) 0100000110011001 b) 1001010110011001 c) 1001011110011001 d) 0101010110011001 e) 0101000110011001 f) 1101010110011001 **Ans: a) 0100000110011001**	1
5	A 12-bit Hamming code consists of 4 parity bits and 8 data bits with EVEN parity. The 4 parity bits are used to correct single bit error, regardless of whether the error occurs in the data or in the parity bits. Are the following three codes valid Hamming codes? If any of them is not valid for even parity, which is that code? A] 111001100111 B]111101110111 C]001000000111 **[L.J.I.E.T]** a) A only b) B only c) C only d) A and B only e) A and C only f) B and C only **Ans: e) A and C only**	1
6	Which Protocol adds a simple error control mechanism to which protocol? **[L.J.I.E.T]** a) Stop and Wait ARQ; stop and wait b) Go-Back and N ARQ; Stop and wait c) Selective Repeat ARQ; Stop and wait d) Go-Back and N ARQ; Selective Repeat	1

	e) Selective Repeat ARQ; Go-Back and N ARQ f) None of the them **Ans: a) Stop and Wait ARQ; stop and wait**	
7	If the transmitted bit sequence is given as 1101011011 and the generated polynomial in encoded sequence is given by 10011. Then find out the actual bit string transmitted? **[L.J.I.E.T]** **a)** 11010110111010 **b)** 11010110110110 c) 11010110111110 d) 11010110110111 **e)** 11010110111100 **f)** 11010110110100 **Ans: c) 11010110111110**	1
8	What will be the checksum value for following bit sequence transmission? 10011001 11100010 00100101 10000100 **[L.J.I.E.T]** a) 0100000010011001 b) 1100010010011001 c) 0100101010011001 d) 1100010010010001 e) 0101001010001001 f) 1100101010001001 **Ans: a) 0100000010011001**	1
9	A 12-bit Hamming code consists of 4 parity bits and 8 data bits with EVEN parity. The 4 parity bits are used to correct single bit error, regardless of whether the error occurs in the data or in the parity bits. Are the following three codes valid Hamming codes? If any of them is not valid for even parity, which is that code? **[L.J.I.E.T]** A]111101110111 B]001001100111 C]001000000111 a) A only b) B only c) C only d) A and B only e) A and C only f) B and C only **Ans: f) B and C only**	1
10	For sending 10 data packets how many number of acknowledgments are needed in stop and wait ARQ? **[L.J.I.E.T]** a) Exactly 10 b) Exactly 20 c) More than 10 d) More than 5 e) Less than 10 f) Less than 20 **Ans: a) Exactly 10**	1
	DESCRIPTIVE QUESTIONS	
1.	What is Error? And Explain Type of Error. **[L.J.I.E.T]**	7
2.	Explain Error Detection. **[L.J.I.E.T]**	7

3.	Describe Error Control Coding in brief. **(New_Nov_2018) [L.J.I.E.T]** Describe the Error Control Coding in detail. **(New_May_2018) [L.J.I.E.T]**	4
4.	Describe any one error detection technique with suitable example. **(New_May_2019) [L.J.I.E.T] (New_Aug_2021) [L.J.I.E.T]**	4
5.	Explain Hamming Code. **[L.J.I.E.T]**	7
6.	Explain Convolutional Codes. **[L.J.I.E.T]**	7
7.	Explain Automatic repeat request. **[L.J.I.E.T]**	7
8.	What is the need of ARQ? Explain Automatic Repeat Request (ARQ) in details? **(New_May_2017) [L.J.I.E.T]**	7
9.	What is the need for ARQ? Explain Sliding Window Protocol with example. **(New_Nov_2017) [L.J.I.E.T]**	7
10.	What is ARQ? What is importance of it? **(New_Nov_2018) [L.J.I.E.T]**	3
11.	Write a short note on selective repeat ARQ. **(New_May_2019) [L.J.I.E.T]**	4
12.	How Error Control is implemented using Automatic Repeat Request (ARQ) mechanism? **(New_Nov_2019) [L.J.I.E.T]**	7
13.	What is the need of ARQ? **(New_Oct_2020) [L.J.I.E.T]**	3
14.	Explain Automatic Repeat Request (ARQ) in details. **(New_Oct_2020) [L.J.I.E.T]**	4
15.	Enlist and explain Error detection methods in cellular wireless network. **(New_Jan_2021) [L.J.I.E.T]**	7
16.	Write a note on stop-and-wait and selective repeat ARQ. **(New_Aug_2021) [L.J.I.E.T]**	7
	NUMERICALS	
1.	For Message M = 1010001101 and Pattern P = 110101, find CRC. **(New_Nov_2017) [L.J.I.E.T]**	4
	CHAPTER NO -3: Multiple Access in Wireless System:	
	TOPIC 1. Multiple access scheme	
	SHORT QUESTIONS	
1	The sharing of a medium and its link by two or more devices is called _____ **[L.J.I.E.T]** a) Fully duplexing b) Half duplexing c) Multiplexing d) Micropleixng e) Duplexing f) None of them **Ans: c) Multiplexing**	1
2	The FDM demultiplexer users a series of ____ to decompose the multiplexed signal into its constituent signals. **[L.J.I.E.T]** a) Physical hardware device b) Carrier frequency c) Guard bands d) Demultiplexers e) Modulators f) Filters **Ans: f) Filters**	1
3	Which of the following is not true for TDMA? **[L.J.I.E.T]** a) Single carrier frequency for single user b) Discontinuous data transmission c) No requirement of duplexers d) High transmission rates	1

	e) All of them f) None of them **Ans: a) Single carrier frequency for single user**	
4	In which multiple access technique , the collision are avoided through the use of three strategies (the interframe space, the contention window, and acknowledgments) **[L.J.I.E.T]** a) CSMA/CA b) CSMA/CD c) Either CSMA/CA or CSMA/ CD d) Both CSMA/CA and CSMA/CD e) TDMA f) None of the them **Ans: a) CSMA/CA**	1
5	A TDMA system uses 30 MHz for the forward link, which is broken into radio channels of 200 kHz. If 8 speech channels are supported on a single radio channel, how many simultaneous users can be accommodated? **[L.J.I.E.T]** a) 25 b) 200 c) 1600 d) 1000 e) 5000 f) None of the them **Ans: f) None of the them**	1
6	In TDM, slots are further divided into _____ **[L.J.I.E.T]** a) Seconds b) Frames c) Packets d) Bits e) Block f) None of them **Ans: b) Frames**	1
7	FDM uses _____ to prevent modulated signal from overlapping **[L.J.I.E.T]** a) Physical hardware device b) Carrier frequency c) Guard bands d) Demultiplexers e) Modulators f) Filters **Ans: c) Guard bands**	1
8	FDD provides _____ distinct bands of frequencies for _____ user **[L.J.I.E.T]** a) Two, two b) One, two c) Two, one d) Two, many e) Many, many f) Many, two **Ans: c) Two, one**	1
9	"A station monitors the medium after it sends a frame to see if the transmission was successful. If so, the station is finished, If, however, there is a collision, the frame is sent again." What kind of Multiple access it is? **[L.J.I.E.T]** a) CSMA/CA	1

	b) CSMA/CD c) Either CSMA/CA or CSMA/ CD d) Both CSMA/CA and CSMA/CD e) TDMA f) None of them **Ans: b) CSMA/CD**	
10	A TDMA system uses 30 MHz for the forward link, which is broken into radio channels of 200 kHz. If 8 speech channels are supported on a single radio channel, how many simultaneous users can be accommodated? **[L.J.I.E.T]** a) 25 b) 200 c) 1000 d) 1200 e) 1600 f) None of them **Ans: d) 1200**	1
11	In which, the single-channel has the ability to carry all transmissions simultaneously? **[L.J.I.E.T]** a) CDMA b) TDMA c) FDMA d) SDMA e) All of them f) None of them **Ans: a) CDMA**	1
	DESCRIPTIVE QUESTIONS	
1.	Explain the following Multiple Access Techniques used to access the channel by mobile subscriber. **(Old_June_2012) [L.J.I.E.T]** • Frequency Division Multiple access. • Space Division Multiple access.	7
2.	Explain the following Multiple Access Techniques used to access the channel by mobile subscriber. **(Old_June_2012) [L.J.I.E.T]** • Time Division Multiple access. • Code Division Multiple access.	7
3.	Explain FDMA with example of Frequency division duplex. **[L.J.I.E.T]**	4
4.	Explain TDMA with example of Time division duplex. **[L.J.I.E.T]**	4
5.	What is CDMA? Explain the orthogonal codes for it. **(Old_Dec_2015) [L.J.I.E.T]**	7
6.	Why medium access control (MAC) is required in wireless networks? Explain with hidden and Exposed terminals & near and far terminals. **[L.J.I.E.T]**	7
7.	What is hidden terminal problem? How it can be avoided? **(New_Nov_2017) [L.J.I.E.T]**	3
8.	Discuss hidden and exposed terminals. **(New_May_2019) [L.J.I.E.T]**	3
9.	Explain in brief Multiple access with collision avoidance (MACA). Justify how MACA can avoid hidden terminal problem. **[L.J.I.E.T]**	7
10.	Explain Hidden Station and Exposed Station Problem in wireless network. Propose the solution for the problem. **(New_Nov_2019) [L.J.I.E.T]**	4
11.	Explain in brief Multiple access with collision avoidance (MACA). Justify how MACA can avoid exposed terminal problem. **[L.J.I.E.T]**	7
12.	Why do MAC scheme in wired network fail in wireless networks. Explain how the multiple access with collision avoidance (MACA) scheme work does. **(Old_Dec_2012) [L.J.I.E.T]**	7
13.	Explain DFWMAC-DCF using CSMA/CA. **(New_May_2019) [L.J.I.E.T]**	7
14.	When Hidden station and Exposed station problem arise in wireless **(New_Jan_2021) [L.J.I.E.T]**	4

	NUMERICALS	
1.	A cellular system uses FDMA with spectrum allocation of 12.5 MHz in each direction, a guard band at the edge of the allocated spectrum of 10 KHz, and a channel bandwidth of 30 KHz. Find out number of channels available. **(New_Nov_2017) [L.J.I.E.T]**	4
2.	Consider Global System for Mobile, which is TDMA/FDD system that uses 25 MHz for the forward link, which is broken in to radio channels of 200 KHz. If 8 speech channels are supported on a single radio channel and if no guard band is assumed, find the no of simultaneous users that can be accommodated in GSM. **(New_Nov_2017) [L.J.I.E.T]**	4
	TOPIC 2. Global system for mobile communication(GSM)	
	SHORT QUESTIONS	
1	What is the full form of GSM? **[L.J.I.E.T]** a) Global System Mobile b) General System Mobile c) Group System Mobile d) Global Service Mobile e) General Service Mobile **f)** None of the them **Ans: a) Global System Mobile**	1
	DESCRIPTIVE QUESTIONS	
1.	Explain the functioning of cellular network. How the given set of frequencies are used to increase the capacity of a network. **(Old_June_2012) [L.J.I.E.T]** What is Cellular network? Explain frequency allocation in GSM network. **(Old_June_2014) [L.J.I.E.T]**	7
2.	Explain following : **(Old_Dec_2014) [L.J.I.E.T]** i. Draw: Cellular Structure. [Marks : 1] ii. Justify: Cell shape is Hexagon. [Marks : 2] iii. How to reuse the limited frequency band in cellular architecture [Marks : 4] [Explain Diagrammatically. Make following assumption: Frequency Band :100-170 Cluster Size : 7]	7
3.	Explain the essential characteristics of frequency reuse concept. Draw and explain cell cluster in GSM for k=4. **(Old_May_2017) [L.J.I.E.T]**	7
4.	What is the principle of frequency reuse in context of cellular networks? List the ways of increasing the capacity of a cellular system? **(New_May_2017) [L.J.I.E.T]** What is Frequency Reuse? Explain Frequency Allocation in GSM. **(Old_May_2016) (Old_May_2018) (Old_Dec_2018) [L.J.I.E.T]**	7
5.	What is Frequency Reuse? Explain with proper diagram. **(New_Nov_2017) [L.J.I.E.T]**	3
6.	What is the frequency range of uplink and downlink in GSM network? **(Old_Dec_2012) [L.J.I.E.T]**	2
7.	Explain different types of power control techniques in cellular networks. **(New_Nov_2017) [L.J.I.E.T]**	4
8.	What is Cellular network? Explain GSM architecture in detail. **(Old_Dec_2015) [L.J.I.E.T]**	7
9.	Describe Cell Splitting and Cell Sectoring with its limitations in detail. **(New_Nov_2019) [L.J.I.E.T]**	7
10.	Explain functional architecture of GSM system. And also give different tele-services provided by GSM**. (Old_Nov_2011) (New_May_2017) [L.J.I.E.T]** Explain functional architecture of GSM system and types of services provided by GSM. **(New_Nov_2018) [L.J.I.E.T]**	7

11.	Draw and explain GSM architecture. **(Old_Dec_2013) [L.J.I.E.T] (New_Jan_2021) [L.J.I.E.T]** Explain GSM architecture and role of its components**. (Old_June_2014) (New_Nov_2016) (New_Nov_2017) [L.J.I.E.T]** List out GSM Specification and explain functional architecture of GSM. **(Old_Dec_2012) [L.J.I.E.T]** Explain functional architecture of GSM**. (Old_Dec_2014) [L.J.I.E.T]** Draw and explain System architecture of GSM **(Old_May_2015) [L.J.I.E.T]** Discuss GSM architecture in detail. **(New_May_2019) [L.J.I.E.T]** Explain GSM architecture. **(Old_Dec_2018) [L.J.I.E.T] (New_Oct_2020) [L.J.I.E.T] (New_Aug_2021) [L.J.I.E.T]** Draw and Explain GSM architecture and role of its components**. (New_Nov_2017) [L.J.I.E.T]**	7
12.	In GSM network, explain the role of Network and Switching subsystem. **(Old_May_2013) [L.J.I.E.T]**	7
13.	Explain term : BSS. **(Old_June_2014) [L.J.I.E.T]**	3.5
14.	List and explain GSM entities**. (Old_Dec_2013)[L.J.I.E.T]**	7
15.	Explain the importance of following identifiers with that GSM is deals with: **(Old_May_2013) [L.J.I.E.T]** • IMEI • IMSI • MSISDN	8
16.	Define IMSI, TMSI, IMEI and MS-ISDN and write their use. **(Old_Dec_2013) [L.J.I.E.T]** Define IMSI, IMEI and MS-ISDN and write their use **(New_Nov_2017) [L.J.I.E.T]**	7
17.	Describe different GSM addresses and identifiers **(Old_May_2015) [L.J.I.E.T]** List and explain various addresses and identifiers used in GSM. **(Old_May_2017) [L.J.I.E.T]** Explain Addresses and Identifiers used in GSM with Example. **(New_Nov_2019) [L.J.I.E.T]**	7
18.	Define IMSI, IMEI and MS-ISDN and write significance of each. **(New_Nov_2018) [L.J.I.E.T]** Define IMSI, IMEI and MSISDN **(New_Aug_2021) [L.J.I.E.T]**	3
19.	Explain the following in brief in context of GSM networks: **(Old_May_2013) [L.J.I.E.T]** (a) Mobile station (b) BSS (c) NSS (d) OSS (e) IMSI (e) IMEI (f) MSRN	7
20.	What is Handover? Explain GSM Architecture with suitable diagram. **(New_Dec_2019) [L.J.I.E.T]**	7
21.	Define and explain following terms : 1) Mobile Computing 2) Handover 3) wireless Broadband **(Old_Dec_2013) [L.J.I.E.T]**	6
22.	Define : Handover in GSM. **(Old_June_2014) [L.J.I.E.T]**	3.5
23.	How is Mobility Management done in GSM? List the various handovers carried out in GSM and explain any one of them in detail. **(Old_Dec_2012) [L.J.I.E.T]** Explain Handoff in detail. **(New_Nov_2016) [L.J.I.E.T]** What is handoff? Explain its various types. **(New_Nov_2017) [L.J.I.E.T]**	7
24.	Explain the handover procedure in GSM system. **(Old_May_2013) (Old_May_2019) [L.J.I.E.T]**	8
25.	Explain the handover procedure in GSM system. **(Old_Dec_2013) (Old_June_2014) (Old_Dec_2014) (Old_Dec_2016) (Old_May_2018) [L.J.I.E.T]**	7
26.	What are the possible handover scenarios in GSM? List out the numbers needed to locate a Mobile Station and to address the Mobile station **(Old_Nov_2011) [L.J.I.E.T]**	7
27.	What are the four possible handover scenarios in GSM? **(Old_Dec_2012) [L.J.I.E.T]**	2
28.	What is handover/handoff? How handoff is different from roaming? **(Old_May_2015) [L.J.I.E.T]** What is handoff and Roaming? Explain the types of handoff in details? **(New_May_2017) [L.J.I.E.T]**	7
29.	What is Handover? Explain types of it in brief. **(New_Nov_2018) [L.J.I.E.T]** Explain handover process in cellular system. **(New_May_2019)[L.J.I.E.T]**	4
30.	What is Handover? Explain GSM Architecture with suitable diagram. **(Old_May_2016)**	7

	[L.J.I.E.T]	
31.	Illustrate different scenarios of Roaming and Handoff in GSM with proper Examples. **(New_Nov_2019) [L.J.I.E.T]**	7
32.	Explain Call routing in GSM with block diagram. **(Old_June_2014) (Old_Dec_2018) [L.J.I.E.T]** Explain Call routing in GSM. **(Old_June_2014) (Old_Dec_2016) [L.J.I.E.T]** What is GSM? Explain how a call is routed in GSM with diagram**. (Old_Dec_2015) [L.J.I.E.T]** Explain Call routing in GSM network. **(Old_Dec_2015) [L.J.I.E.T]** Explain routing in mobile network. **(Old_Dec_2015) [L.J.I.E.T]** Explain GSM call routing. **(New_May_2019) [L.J.I.E.T] (New_Aug_2021) [L.J.I.E.T]**	7
33.	Explain mobile originated call and mobile terminated call procedure. **(Old_Dec_2012) [L.J.I.E.T]** Explain call routing for a mobile terminating call. **(Old_Dec_2013) [L.J.I.E.T]** Draw and Explain Call routing for a mobile terminating call in GSM. **(Old_Dec_2014) [L.J.I.E.T]**	7
34.	What are HLR and VLR? Describe its functions in call routing and roaming. **(Old_June_2012) [L.J.I.E.T]** Explain the functionality of HLR and VLR in call routing. **(Old_Dec_2015) [L.J.I.E.T]** Explain the functionality of HLR and VLR in call routing. **(New_Dec_2019) [L.J.I.E.T]**	7
35.	What are HLR and VLR? Describe its functions in call routing and roaming. **(New_May_2018) (New_Nov_2018) [L.J.I.E.T]**	4
36.	Explain the purpose of Home Location Register (HLR). List the information which is stored in Home Location Register (HLR). **(New_Nov_2019) [L.J.I.E.T]**	3
37.	Compare Paging and Location update in GSM. **(New_Nov_2019) [L.J.I.E.T]**	3
38.	Explain Different types of GSM Channels. **(Old_Dec_2012) [L.J.I.E.T]**	7
39.	Write Note on Signaling Protocol Structure in GSM**. (Old_Dec_2014) [L.J.I.E.T]**	7
40.	Explain: Handover, Authentication and Security in GSM. **(Old_June_2014) (Old_Dec_2015) [L.J.I.E.T]**	7
41.	Explain: Handover, Authentication and Security in GSM. **(New_May_2018) [L.J.I.E.T]**	4
42.	Give six functions where CDMA is different from GSM. **(Old_June_2012) [L.J.I.E.T]**	6
43.	Differentiate CDMA technology and GSM technology. **(Old_Dec_2012) [L.J.I.E.T]** Give six functional differences between CDMA and GSM. **(Old_May_2013) [L.J.I.E.T]** Compare : CDMA and GSM **(Old_June_2014) (Old_Dec_2015) (New_Nov_2017) [L.J.I.E.T]** Compare GSM and CDMA **(Old_May_2016) [L.J.I.E.T]**	7
44.	List and discuss at least seven functions where CDMA is different from GSM**. (Old_Dec_2013) [L.J.I.E.T]**	7
45.	Differentiate GSM and CDMA. **(New_May_2019) [L.J.I.E.T]** Differentiate GSM and CDMA. **(New_Aug_2021) [L.J.I.E.T]**	3 4
46.	Compare GSM and CDMA technology. **(New_Nov_2018) [L.J.I.E.T]**	3
47.	Explain any three addresses and identifiers used in GSM with example **(New_Oct_2020) [L.J.I.E.T]**	3
48.	Show the use of below GSM Identifiers. i) IMEI ii) IMSI iii) MSISDN iv) MSRN **(New_Jan_2021) [L.J.I.E.T]**	4
49.	Justify, Why Hexagon cell shape is used in cellular network? **(New_Jan_2021) [L.J.I.E.T]**	3
50.	Define Handover. List and explain the types of handover. **(New_Jan_2021) [L.J.I.E.T]**	4
51.	Explain Extended service set(ESS) and Basic service set(BSS) in 802.11 architecture **(New_Jan_2021) [L.J.I.E.T]**	4
52.	Discuss the A3 and A8 algorithms. **(New_Aug_2021) [L.J.I.E.T]**	4
	TOPIC 3. General packet radio Service(GPRS)	
	DESCRIPTIVE QUESTIONS	

1.	What kind of changes need in GSM to Convert it into GPRS explain that? Explain application of GPRS? **(New_May_2017) [L.J.I.E.T]**	7
2.	Explain functional architecture of GPRS system. What is the frequency range of uplink and downlink in GPRS network? **(Old_Nov_2011) [L.J.I.E.T]** Draw and explain GPRS architecture. **(Old_June_2014) [L.J.I.E.T]** Explain GPRS operations with its architecture. **(Old_June_2014) (Old_Dec_2015) [L.J.I.E.T]** Draw GPRS System Architecture. Discuss GPRS network enhancement over GSM. **(Old_May_2017) (Old_Dec_2018) (Old_May_2019) [L.J.I.E.T]**	7
3.	Explain the GPRS system architecture. **(Old_June_2012) [L.J.I.E.T]**	8
4.	Discuss the network elements in GPRS that are different from GSM. Also discuss applications and limitations of GPRS. **(New_Nov_2016) (New_Nov_2018) [L.J.I.E.T]**	7
5.	Define SGSN and GGSN. **(Old_Dec_2013) [L.J.I.E.T]** Explain SGSN and GGSN? **(New_Aug_2021) [L.J.I.E.T]**	3
6.	Describe what are the limitations of GPRS? **(Old_Dec_2012) [L.J.I.E.T]** Write a short note on limitations of GPRS **(Old_Dec_2013) [L.J.I.E.T]**	3
7.	Limitations of GPRS **(Old_Dec_2013) [L.J.I.E.T]**	3.5
8.	Explain the limitations of GPRS. **(Old_Dec_2016) [L.J.I.E.T]**	7
9.	Discuss briefly: Limitations of GPRS. **(New_Nov_2018) [L.J.I.E.T]**	4
10.	Explain GPRS system architecture. Also discuss limitations of GPRS.**(Old_May_2018) [L.J.I.E.T]**	7
11.	Explain the GPRS functional architecture and application. **(Old_Dec_2012) [L.J.I.E.T]** Explain the GPRS functional architecture and its application. **(Old_Dec_2014) [L.J.I.E.T]** Discuss GPRS-Specific Applications. **(Old_Dec_2013) [L.J.I.E.T]** Discuss GPRS specific applications along with limitations of GPRS. **(Old_May_2019) [L.J.I.E.T]**	7
12.	Describe the applications for GPRS. **(Old_Nov_2011) (Old_Dec_2016) [L.J.I.E.T]** Describe the applications for GPRS. **(New_Dec_2019) [L.J.I.E.T]**	7
13.	Discuss GPRS specific applications along with limitations of GPRS. **(Old_May_2017) [L.J.I.E.T]**	7
14.	Explain Term: Application and tunneling modes in GPRS **(Old_June_2014) [L.J.I.E.T]**	3.5
15.	Discuss data services in GPRS. Describe applications suitable for GPRS. **(Old_Dec_2014) (Old_May_2015) [L.J.I.E.T]**	7
16.	Write a note on PDP context activation procedure with respect to GPRS. **(Old_Dec_2013) [L.J.I.E.T]**	4
17.	What is PDP Address? Explain PDP Context Activation in GPRS. **(Old_May_2016) (Old_May_2019) [L.J.I.E.T]**	7
18.	Explain the PLMN Interface. **(New_May_2018) [L.J.I.E.T]**	3
19.	What is a PLMN? How is a PLMN connected to PSTN and PDN? **(Old_Dec_2016) [L.J.I.E.T]**	7
20.	How the packets are routed in GPRS. Explain GPRS packet routing for Inter & Intra PLMN. **(Old_Dec_2014) [L.J.I.E.T]** Explain routing between PLMNs for GPRS system. **(Old_June_2014) [L.J.I.E.T]** Establish the relationship between PLMN and GPRS. Explain it using block diagram. **(Old_Dec_2015) [L.J.I.E.T]** Explain Routing between PLMNs of GPRS. **(Old_May_2016) [L.J.I.E.T]** Explain the data routing in GPRS. **(Old_Dec_2016) [L.J.I.E.T]**	7
21.	Explain Voice and Data Routing in GPRS with proper diagram. **(New_Nov_2019) [L.J.I.E.T]**	3
22.	Explain call routing in the context of GPRS networks. **(Old_May_2013) (Old_May_2015) [L.J.I.E.T]**	7
23.	How is data routing done in GPRS? In what respect is data routing different from voice routing? **(Old_May_2013) [L.J.I.E.T]**	7
24.	Discuss Billing and Charging in GPRS network. **(Old_June_2014) (Old_May_2015) [L.J.I.E.T]**	7

25.	What is GPRS? How billing and charging is done in GPRS? **(New_Nov_2017) [L.J.I.E.T]** How billing and charging functions are handled in GPRS? **(New_Nov_2018) [L.J.I.E.T]**	4
26.	Draw and Explain Transmission Plane Protocol Architecture of GPRS**. (Old_Dec_2014) [L.J.I.E.T]** Explain the GPRS Transmission Protocol Stack with the neat diagram. **(New_May_2018) [L.J.I.E.T]** Draw and explain the GPRS transmission plane protocol model. **(New_May_2019) [L.J.I.E.T]** Explain the GPRS transmission plane protocol model **(New_Aug_2021) [L.J.I.E.T]**	7
27.	What is the difference between GSM and GPRS? What are the network elements in GPRS that area different from GSM? What are the limitations of GPRS. **(Old_May_2013) [L.J.I.E.T]** What is the difference between GSM and GPRS? What are the network elements in GPRS that are different from GSM? **(Old_Dec_2016) [L.J.I.E.T]**	7
28.	Differentiate the GSM and GPRS. **(New_May_2018) [L.J.I.E.T]**	4
29.	What is the difference between GSM and GPRS? How is data routing done in GPRS? **(Old_May_2015) [L.J.I.E.T]**	7
30.	Compare the Following : (i) GSM and GPRS (ii) Wimax and WiFi **(New_May_2017) [L.J.I.E.T]**	7
31.	Draw and explain the GPRS transmission plane protocol model **(New_Oct_2020) [L.J.I.E.T]**	7
32.	List and explain functionality of Serving GPRS Support Node(SGSN) and Gateway GPRS Support Node(GGSN). **(New_Jan_2021) [L.J.I.E.T]**	3
	TOPIC 4. Wireless system operations and standards	
	DESCRIPTIVE QUESTIONS	
1.	Write a note on DECT frame format. **(New_Nov_2016) [L.J.I.E.T] (New_Oct_2020) [L.J.I.E.T]**	4
2.	Explain DECT Protocol Architecture. (**New_Nov_2017) [L.J.I.E.T]**	3
3.	Explain architecture of IEEE 802.16 standard **(Old_Dec_2012) [L.J.I.E.T]**	7
4.	Explain WiMAX three layer architecture. **(Old_May_2013) [L.J.I.E.T]**	7
5.	Explain WiMax **(Old_Dec_2013) [L.J.I.E.T]**	3.5
	TOPIC 5. Mobile IP and Wireless Application Protocol	
	DESCRIPTIVE QUESTIONS	
1.	What are limitations of traditional IP to support the mobile technology? How does Mobile IP works? **(Old_June_2012) [L.J.I.E.T]**	8
2.	Explain how does mobile IP work? What are the challenges with mobile IP with respect to high speed mobility? How does cellular IP solve some of these challenges? **(Old_Dec_2012) [L.J.I.E.T]**	7
3.	What is cellular IP? Establish its relationship with mobile IP. **(Old_June_2014) [L.J.I.E.T]**	7
4.	Why conventional network IP is not suitable for mobile environment? How Mobile IP works? **(Old_May_2013) [L.J.I.E.T]**	6
5.	Why conventional network IP is not suitable for mobile environment? Describe the way in which Mobile IP works? **(Old_Dec_2014) [L.J.I.E.T]**	7
6.	Compare: IP and Mobile IP. **(Old_June_2014)(Old_Dec_2015) [[L.J.I.E.T]**	7
7.	How does the Mobile IP work? Explain its architecture. **(Old_Dec_2013) (Old_May_2015) [L.J.I.E.T]** What do you mean by mobile IP? How does mobile IP work? **(Old_Dec_2016) [L.J.I.E.T]** Explain operation of Mobile IP. **(New_Nov_2016) [L.J.I.E.T]** Discuss Mobile IP. **(New_May_2019) [L.J.I.E.T] (New_Oct_2020) [L.J.I.E.T]** What do you mean by mobile IP? How does mobile IP work? **(New_Dec_2019) [L.J.I.E.T]**	7
8.	Explain how the Mobile IP works. **(New_May_2018) [L.J.I.E.T]**	3
9.	Identify the use of Mobile IP. How does Mobile IP work? **(New_Nov_2019) [L.J.I.E.T]**	4

10.	How does Mobile IP works? Also briefly explain Mobile Computing OS. **(Old_Dec_2014) [L.J.I.E.T]**	7
11.	Explain tunnelling operation in Mobile IP. Discuss the new fields in Mobile IP other than IP. **(Old_May_2017) [L.J.I.E.T]**	7
12.	Explain tunnelling and encapsulation in mobile IP. **(Old_Nov_2011) [L.J.I.E.T]**	7
13.	What is Mobile IP? Explain the tunnelling in context of Mobile IP. **(Old_May_2013) (Old_May_2015) (Old_May_2019) [L.J.I.E.T]** How mobile IP works? Explain tunnelling with mobile IP. **(Old_Dec_2015) [L.J.I.E.T]**	7
14.	Explain the tunnelling Operation in Mobile IP. **(Old_May_2013) [L.J.I.E.T]**	8
15.	What is a mobile IP? Explain discovery, registration and tunnelling with mobile IP. **(Old_June_2014) (Old_May_2016) (New_Nov_2017) (Old_May_2018) (New_Nov_2018) (Old_Dec_2018) [L.J.I.E.T]**	7
16.	What are the needs of Mobile IP? Explain handoff operation in Mobile IP. **(New_May_2017) [L.J.I.E.T]**	7
17.	Explain : Spread Spectrum and WAP. **(Old_June_2014) (Old_Dec_2015) [L.J.I.E.T]**	7
18.	Write a short note on: WAP **(Old_Dec_2016) (Old_May_2018) (Old_Dec_2018) [L.J.I.E.T]** Write a short note on WAP **(New_Dec_2019) [L.J.I.E.T]**	7
19.	Describe the WAP protocol stack. What are the functions of different layers in this protocol stack? **(Old_Dec_2012) [L.J.I.E.T]** Describe the WAP protocol stack while enumerating the functions of different layers. **(Old_May_2013) [L.J.I.E.T]** Explain the WAP Layered architecture and protocol stack. **(Old_Dec_2014) [L.J.I.E.T]** Explain Wireless Application Protocol (WAP) in detail. **(New_Nov_2017) [L.J.I.E.T]**	7
20.	Explain the WAP Layered architecture and protocol stack. **(Old_May_2013) [L.J.I.E.T]**	6
21.	Explain the WAP Stack with neat diagram. **(New_May_2018) [L.J.I.E.T]**	3
22.	State the requirements of WAP and explain different layers of WAP. What are the advantages of WML Script over WML**? (Old_Nov_2011) [L.J.I.E.T]**	7
23.	Wireless Transaction Protocol (WTP). **(Old_Dec_2013) [L.J.I.E.T]**	3.5
24.	Explain the Wireless Session Protocol Primitives and Parameters. **(New_May_2018) [L.J.I.E.T]**	3
25.	What is a WAP gateway? What are its functions**? (Old_Dec_2012) [L.J.I.E.T]**	4
26.	Discuss the WAP gateway for coding and encoding. **(Old_June_2014) (Old_May_2019) [L.J.I.E.T]**	7
27.	Explain WAE logical model. **(Old_Dec_2013) [L.J.I.E.T]** What is WAE? Draw its model with client, gateway and server.**(Old_June_2014) (Old_Dec_2015) (Old_May_2016) [L.J.I.E.T]**	7
28.	Describe Wireless application protocol. **(New_Jan_2021) [L.J.I.E.T]**	3
29.	Define Mobile IP. Explain Agent discovery, Registration and Data transfer in Mobile IP. **(New_Jan_2021) [L.J.I.E.T]**	7
30.	Explain Mobile IP **(New_Aug_2021) [L.J.I.E.T]**	7
	CHAPTER NO -4: **Wi-Fi and the IEEE 802.11 Wireless LAN Standard:**	
	DESCRIPTIVE QUESTIONS	
1.	Explain IEEE 802.11 standards in details. **(Old_Dec_2015) [L.J.I.E.T]**	7
2.	List all and explain any five IEEE 802.11 services. **(New_Nov_2016) [L.J.I.E.T] (New_Oct_2020) [L.J.I.E.T]**	7
3.	Define Mobile Ad hoc Networks. Discuss its characteristics and limitations.**(Old_Dec_2018) [L.J.I.E.T]**	7
4.	Draw and Explain the IEEE 802.11 Architecture in Details? **(New_May_2017) [L.J.I.E.T]**	7

	Explain IEEE 802.11 architecture and services. **(New_Nov_2018) [L.J.I.E.T]** Explain IEEE 802.11 architecture and its services **(New_Aug_2021) [L.J.I.E.T]** Draw and explain the IEEE 802.11 architecture in detail. **(New_Oct_2020) [L.J.I.E.T]**	
5.	Explain IEEE 802.11 Architecture. **(New_Nov_2017) [L.J.I.E.T]** Explain the IEEE 802.11 Architecture with the neat diagram. **(New_May_2018) [L.J.I.E.T]** Draw and Explain IEEE 802.11 protocol architecture. **(New_Nov_2019) [L.J.I.E.T]**	4
6.	Discuss with suitable diagram distributed coordination function with IEEE 802.11 medium access control logic. **(New_Nov_2016) [L.J.I.E.T]**	7
7.	Enlist and Explain services provided by IEEE 802.11. **(New_Nov_2019) [L.J.I.E.T]**	3
8.	Explain Wireless LAN standards and Wireless LAN architecture. **(Old_June_2014) (Old_May_2015) [L.J.I.E.T]**	7
9.	List and explain different types of wireless LAN. **(Old_Dec_2013) [L.J.I.E.T]**	7
10.	List types of wireless LAN. Difference between Ad hoc verses infrastructure mode. **(Old_May_2015) [L.J.I.E.T]**	7
11.	Give advantages of Wireless LAN. **(Old_May_2017) [L.J.I.E.T]**	7
12.	Mention some of the advantages and dis advantages of WLANS? Mention the design goals of WLANS? **(Old_Nov_2011) [L.J.I.E.T]**	7
13.	What are the advantages of WLAN. **(New_May_2019) [L.J.I.E.T]**	3
14.	Draw and explain MAC frame Format in WLAN. **(New_Nov_2019) [L.J.I.E.T]**	3
15.	What re the advantages and disadvantages of wireless LAN? Under what situation is a wireless LAN desirable over wired LAN? **(Old_Dec_2012) [L.J.I.E.T]**	7
16.	Describe Wireless LAN advantages. Also explain mobility in wireless LAN. **(Old_Dec_2014) [L.J.I.E.T]**	7
17.	How are mobility and handoff managed in wireless LAN? **(Old_Dec_2012) [L.J.I.E.T]**	7
18.	How authentication is possible in wireless LAN? List and discuss the possible attacks on such networks. **(Old_June_2014) [L.J.I.E.T]**	7
19.	Explain Wireless LAN security issues and also explain hidden & exposed terminal problem in wireless LAN. **(Old_Dec_2012) (Old_May_2016) (Old_May_2018) [L.J.I.E.T]** List Wireless LAN security issues and What do you understand by hidden & exposed terminal problem in wireless LAN. **(Old_Dec_2014) [L.J.I.E.T]** Discuss security issues with wireless networks. **(Old_Dec_2015) [L.J.I.E.T]** Explain wireless LAN security. **(Old_May_2018) [L.J.I.E.T]**	7
20.	Compare Wifi Vs. 3G and also discuss wireless LAN security issues. **(Old_Nov_2011) [L.J.I.E.T]** Describe the contrast between 3G and Wi-Fi technologies. **(Old_May_2013) (Old_Dec_2014) (Old_May_2015) [L.J.I.E.T]** Discuss 3G versus Wifi **(Old_May_2015) [L.J.I.E.T]**	7
21.	Compare the WiFi and 3G Technologies. **(Old_May_2013) [L.J.I.E.T]**	6
22.	Differentiate the WiMAX and WiFi Technologies. **(Old_June_2012) [L.J.I.E.T]**	6
23.	Explain Wi-Fi and Wi-Max technology in detail. Also discuss the differences. **(Old_Dec_2015) [L.J.I.E.T]** Explain WiFi and WiMax technology in detail. **(Old_May_2016) (Old_Dec_2018) (Old_May_2019) [L.J.I.E.T]**	7
24.	What is WiMax? How it is differ from WiFi? **(New_Dec_2019) [L.J.I.E.T]**	7
25.	What is WiMax?How is it different from WiFi? **(Old_May_2017) (Old_May_2018) [L.J.I.E.T]**	
26.	Differentiate the WiMAX and WiFi. **(New_May_2018) [L.J.I.E.T]** What is WiMax? How is it different from WiFi? (**Old_Dec_2012) [L.J.I.E.T]**	3
27.	Explain Term : WiFi v/s WiMax. **(Old_June_2014) [L.J.I.E.T]**	3.5
28.	Compare and contrast WiMAX and WiFi technologies. **(Old_Dec_2013) [L.J.I.E.T]** What is WiMax? How is it different from WiFi? (**Old_May_2017) [L.J.I.E.T]**	7
29.	Classify and express Services provided by IEEE 802.11. **(New_Jan_2021) [L.J.I.E.T]**	3

	CHAPTER NO -5: Bluetooth:	
	DESCRIPTIVE QUESTIONS	
1.	What is an ISM band? "It is a free band" Justify**. (Old_Dec_2013) [L.J.I.E.T]**	3
2.	Explain: Blue tooth **(Old_June_2014) (Old_May_2015) (Old_Dec_2015) [L.J.I.E.T]**	4
3.	Explain the power saving states of Bluetooth device. **(New_May_2019) [L.J.I.E.T]**	3
4.	List the merits and demerits of Bluetooth. **(Old_Dec_2012) [L.J.I.E.T]**	2
5.	Explain concept of Bluetooth Architecture. What is the difference between infrastructure and ad-hoc networks? **(Old_Nov_2011) [L.J.I.E.T]**	7
6.	Differentiate infrastructure and ad-hoc network. **(New_May_2019) [L.J.I.E.T]**	3
7.	What is an ad-hoc network? **(Old_Dec_2012) [L.J.I.E.T]**	2
8.	Ad hoc v/s Infrastructure mode for wireless architecture. **(Old_Dec_2013) [L.J.I.E.T]**	3.5
9.	Explain following protocol used in the Bluetooth technology **(Old_June_2012) [L.J.I.E.T]** 1. Link Manager Protocol. 2. Logical Link Control and Adaptation Protocol. 3. Service Discovery protocol. 4. RFCOMM	8
10.	Explain L2CAP protocol of Bluetooth. (**New_May_2019) [L.J.I.E.T]** Explain L2CAP protocol of Bluetooth **(New_Oct_2020) [L.J.I.E.T]**	4 3
11.	What is Bluetooth? Elaborate Bluetooth protocol stack **(Old_Dec_2013) [L.J.I.E.T]** Explain Bluetooth Protocol Stack. **(Old_Dec_2014) (Old_May_2018) [L.J.I.E.T]** Describe protocol stack of Bluetooth **(Old_Dec_2018) (Old_May_2015) [L.J.I.E.T]** Explain Bluetooth Protocol Stack in detail **(Old_May_2016) [L.J.I.E.T]** Draw and explain the Bluetooth protocol stack. **(Old_Dec_2016) [L.J.I.E.T]** Draw and explain Bluetooth Protocol Architecture. **(New_May_2017) (New_Nov_2017) (New_May_2018) (New_Nov_2018) [L.J.I.E.T]** Write a note on Bluetooth protocol stack. **(New_May_2019) [L.J.I.E.T] (New_Aug_2021) [L.J.I.E.T]** Draw and explain Bluetooth protocol stack. **(New_Nov_2016) [L.J.I.E.T] (New_Oct_2020) [L.J.I.E.T] (New_Jan_2021) [L.J.I.E.T]** Explain each layer of Bluetooth Protocol Stack. **(New_Nov_2019) [L.J.I.E.T]** Explain Bluetooth Protocol Stack in detail. **(New_Dec_2019) [L.J.I.E.T]** Draw and explain the Bluetooth protocol stack. **(Old_May_2019) [L.J.I.E.T]**	7
12.	Explain Bluetooth Protocol Stack in detail. Define piconet and scatternet. **(Old_Dec_2013) [L.J.I.E.T]**	7
13.	Draw the Bluetooth protocol stack and explain the host controller interface. **(Old_June_2014) [L.J.I.E.T]**	7
14.	Bluetooth Protocol Stack**. (Old_Dec_2015) [L.J.I.E.T]**	3.5
15.	What is piconet? What is scatternet? Explain how they form in Bluetooth radio technology? Also give the answer of following questions. **(Old_June_2012) [L.J.I.E.T]** 1. Which ISM frequency band it is use? 2. How many maximum channel it is sup port? 3. How many maximum slave can be communicate with Master at a time?	8
16.	What is piconet and scatternet? Explain. How many maximum numbers of devices can communicate within one piconet? **(Old_May_2013) [L.J.I.E.T]** What is piconet and scatternet? Explain both in brief with appropriate diagrams. **(Old_Dec_2014)[L.J.I.E.T]**	7
17.	State the applications of Bluetooth and differentiate between Piconet and Scatternet with neat diagram. **(New_Nov_2019) [L.J.I.E.T]**	7

18.	Piconet in Bluetooth**. (Old_Dec_2015) [L.J.I.E.T]**	3.5
19.	Write a note on piconet and scatternet. **(New_Nov_2016) [L.J.I.E.T]** Discuss Piconet and Scatternet. **(New_May_2019) [L.J.I.E.T]** Explain piconet and scatternet. **(New_Oct_2020) [L.J.I.E.T] (New_Aug_2021) [L.J.I.E.T]**	3
20.	How does a new Bluetooth device discover a Bluetooth network? For interoperability, the system needs to be open. Describe the security principles in Bluetooth. **(Old_Dec_2012) [L.J.I.E.T]** How does a new Bluetooth device discover a Bluetooth network? Describe the security principles in Bluetooth. **(Old_May_2013) [L.J.I.E.T]**	7
21.	Difference between SOC and AOC client. **(Old_Dec_2012) [L.J.I.E.T]**	3.5
22.	What SOC and AOC Clients? Compare them. **(Old_May_2013) [L.J.I.E.T]** Compare SOC and AOC clients **(Old_May_2017) [L.J.I.E.T]** What is mobile computing? Compare SOC and AOC clients. **(Old_May_2018) [L.J.I.E.T]** What is mobile computing? Compare SOC and AOC clients. **(New_Dec_2019) [L.J.I.E.T]**	7
23.	List the functionality of Service Discovery Protocol(SDP). **(New_Jan_2021) [L.J.I.E.T]**	3
24.	Explain Piconet and Scatternet. **(New_Jan_2021) [L.J.I.E.T]**	4
	CHAPTER NO -6: Android:	
	DESCRIPTIVE QUESTIONS	
1.	Draw Android Architecture. Also explain Android Application Framework in brief.**(New_Nov_2017) [L.J.I.E.T]** Explain Android architecture with diagram. **(New_Nov_2018) [L.J.I.E.T]** Explain Android platform architecture. **(New_May_2019) [L.J.I.E.T] (New_Aug_2021) [L.J.I.E.T]**	7
2.	Explain the Android Architecture with the neat diagram. **(New_May_2018) [L.J.I.E.T]**	4
3.	Explain Android application framework with their components. **(New_May_2017) [L.J.I.E.T]**	7
4.	Describe Android application Architecture. **(New_Nov_2019) [L.J.I.E.T]**	7
5.	Explain Content Provider in Android. **[L.J.I.E.T]**	4
6.	Explain types of Intents. **(New_May_2019) [L.J.I.E.T] (New_Aug_2021) [L.J.I.E.T]**	3
7.	Discuss the manifest file with example. **(New_May_2019) [L.J.I.E.T] (New_Oct_2020) [L.J.I.E.T] (New_Aug_2021) [L.J.I.E.T]**	4
8.	Explain Lifecycle of android API. **[L.J.I.E.T]**	7
9.	Discuss Activity life cycle in Android. **(New_May_2019) [L.J.I.E.T]** Discuss Activity life cycle in Android **(New_Aug_2021) [L.J.I.E.T]**	4 3
10.	Define Android layout. Explain various Android layouts. **(New_Nov_2016) (New_May_2018) [L.J.I.E.T] (New_Oct_2020) [L.J.I.E.T]** Explain different layouts in android. **(New_Nov_2018) [L.J.I.E.T]**	7
11.	Enlist & Explain common layouts available in android. **(New_Nov_2019) [L.J.I.E.T]**	7
12.	Explain Android EditText and TextView control with an example. **(New_Nov_2016) [L.J.I.E.T] (New_Oct_2020) [L.J.I.E.T] (New_Aug_2021) [L.J.I.E.T]**	4
13.	Explain Android TextView control with an example. **(New_Nov_2018) [L.J.I.E.T]**	3
14.	Explain Android ButtonView control with an example. **(New_Nov_2018) [L.J.I.E.T]**	3
15.	What are the common layouts available in Android? Elaborate any two layouts. **(New_Jan_2021) [L.J.I.E.T]**	4
16.	Define and explain Android Framework **(New_Jan_2021) [L.J.I.E.T]**	3
17.	Sketch and express meaning of every component of Android architecture. **(New_Jan_2021) [L.J.I.E.T]**	7