Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

FIFTH SEMESTER B.TECH DEGREE EXAMINATION, APRIL 2018

Course Code: CS307

Course Name: DATA COMMUNICATION (CS)

Max. Marks: 100 Duration: 3 Hours

PART A

Answer all questions, each carries 3 marks Marks

1		Mention the purpose of cladding in Optical Fibres?	(3)
2		What is the channel capacity for a teleprinter channel with a 300-Hz bandwidth and a signal-to-noise ratio of 3 dB, where the noise is white thermal noise?	(3)
3		What is Bandwidth? A periodic signal has a Bandwidth of 20 Hz. The Highest frequency is 60 Hz. What is the lowest Frequency? Draw the Spectrum if the signal contains all frequencies of same amplitude.	(3)
4		Indicate some significant differences between broadcast radio and microwave.	(3)

PART B

Answer any two full questions, each carries 9 marks

5	a)	Differentiate between Attenuation and Delay Distortion.	(4.5)
	b)	For a parabolic reflective antenna operating at 12 GHz with a diameter of 2 m, Calculate the effective area and the antenna gain.	(4.5)
6	a)	Briefly discuss Line of Sight Propagation.	(4.5)
	b)	Assume that a TV picture is to be transmitted over a channel with 4.5 MHz Bandwidth and a 35 dB SNR Ratio. Find the capacity of the channel.	(4.5)
7	a)	What is the thermal noise level of a channel with a bandwidth of 10 KHz carrying 1000 Watts of power operating at 50^{o}C?	(4.5)
	b)	Explain the followingterms: i) Direct broadcast satellite (DBS) ii) Isotropic antenna	(4.5)

PART C

Answer all questions, each carries 3 marks

8		Find the Bandwidth for a signal transmitting at 12 Mbps for QPSK. The value of d=0.	(3)
9		Encode the given bit stream using NRZ-I. 100010001111	(3)
10		What is CDMA? Explain.	(3)
11		Explain Space Division Multiplexing.	(3)

PART D

Answer any two full questions, each carries 9 marks

12	a)	Differentiate between Synchronous TDM and Statistical TDM. Why is a statistical time division multiplexer more efficient than a synchronous time division multiplexer?	(4.5)

	b)	With a neat Sketch discuss the various steps involved in PCM.	(4.5)
13	a)	Given the bit pattern 101110001. Encode the stream using BFSK and QPSK.	(4.5)
	b)	Explain frequency division multiplexing. How is interference avoided by using FDM?	(4.5)
14	a)	Explain the analog modulation techniques briefly.	(4.5)
	b)	Discuss Synchronous Optical NETwork (SONET).	(4.5)

PART E

Answer any four full questions, each carries 10 marks

15	a)	In a CRC error-detecting scheme, choose divisor polynomial P: $x^4 + x + 1$. Encode the bits 10010011011.	(7)
	b)	Why would you expect a CRC to detect more errors than a parity bit?	(3)
16	a)	What is meant by Hamming distance?	(3)
	b)	Derive a Hamming code for single bit error correction (For a data of length 7 Bit).	(7)
17	a)	Discuss synchronous transmission. How is synchronization provided for synchronous transmission?	(7)
	b)	What is a major disadvantage of asynchronous transmission?	(3)
18	a)	Explain the difference between datagram and virtual circuit operation.	(7)
	b)	What is the significance of packet size in a packet-switching network?	(3)
19	a)	What are the advantages of packet switching compared to circuit switching.	(7)
	b)	What is meant by setup phase in circuit switching?	(3)
20		Explain the following terms: i) DSSS ii) FHSS	(10)

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