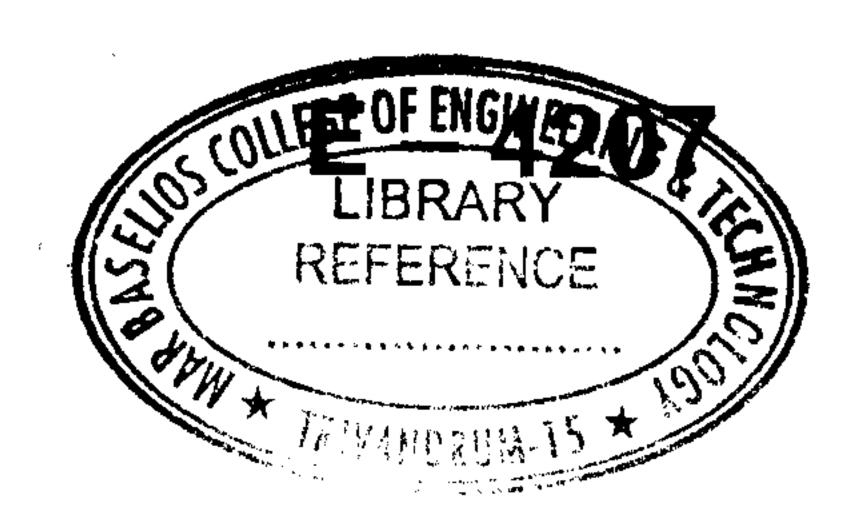
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(Pages : 3)

Reg. No.	
Name :	



Fourth Semester B.Tech. Degree Examination, August 2018 (2013 Scheme) 13.404 : DATA COMMUNICATION (FR)

Time: 3 Hours Max. Marks: 100

PART - A

Answer all questions. Each question carries 4 marks.

- 1. What are the possible propagation modes when propagating light along optical channels?
- 2. Show the Manchester and differential Manchester encoding for the bit pattern 1001111100010001.
- 3. Distinguish between forward error correction versus error correction by retransmission.
- 4. Suppose the message 1011001001001011 is protected from errors using the polynomial $x^8 + x^2 + x^1 + 1$. Determine the message that should be transmitted.
- 5. Write down the advantages of packet switching over circuit switching.

PART - B

Answer one full question from each Module.

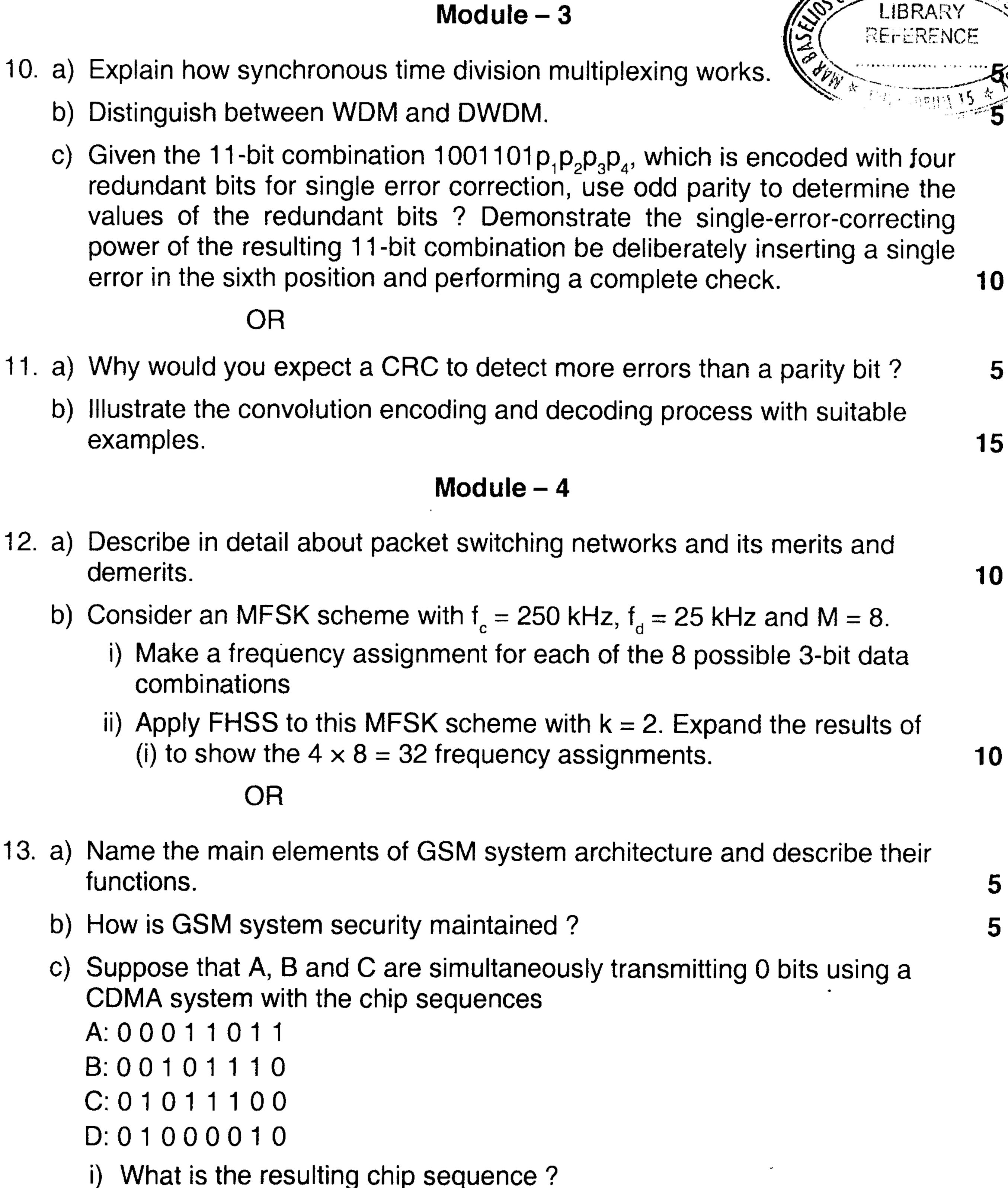
Module - 1

- 6. a) Given a channel with an intended capacity of 20 Mbps, the bandwidth of the channel is 3 MHz. Assuming white thermal noise, what is the signal-to-noise ratio required to achieve this capacity?
 - b) What are the major advantages and disadvantages of microwave transmission?

P.T.O.

	c)	Explain the following :	
		i) Interlacing	
		ii) Signal-to-noise ratio	
		iii) Intersymbol interference.	8
		OR	
7.	a)	A line has a signal-to-noise ratio of 2000 and a bandwidth of 5000 KHz. What is the maximum data rate supported by his line?	•
	b)	Discuss in detail about antennas used for microwave communication.	(
	c)	How do you measure the theoretical channel capacity using Shannon formula? Explain with example.	{
		Module – 2	
8.	a)	Consider a PCM system in which 30 channels are to be time division multiplexed. The bandwidth of each channel is 3 kHz. The sampling rate is 33.33% higher than the theoretical minimum and 8 bits are used for each sample. Determine the required bit rate and find the minimum required transmission bandwidth.	*
	b)	Explain the approaches by which Shannon and Nyquist places an upper imit on the bit rate of a channel. How they are related with each other?	{
	c)	Write short notes on FSK method.	4
		OR	
9.	a)	Given the narrow audio bandwidth of a telephone transmission facility, a nominal SNR of 56dB and a certain level of distortion,	r
		i) What is the theoretical maximum channel capacity of traditional telephone lines ?)
		i) What is the actual maximum channel capacity?	
		i) Repeat (i) and (ii) for 0.2% of distortion.	1 (
	b)	With suitable examples, illustrate the various methods used to encode the analog data into digital signals.	1 (

Module – 3



ii) A CDMA receiver gets the following chip (-1+1-3+1-1-3+1).

stations transmitted and which bits did each one send?

Assuming the chip sequences defined in the above problem, which