

**B.Tech. SEM -V Info. Tech. 2014 Course (CBCS) : SUMMER - 2019**  
**SUBJECT: ELECTIVE – I : INFORMATION THEORY AND CODING**

Day: Wednesday  
 Date : 15/05/2019

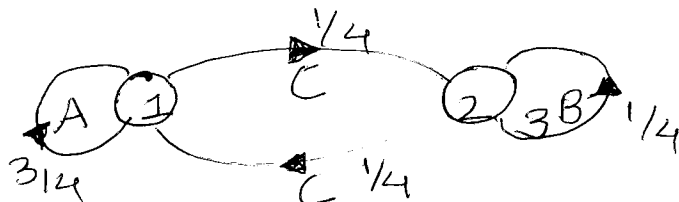
S-2019-2684

Time : 10.00 AM TO 01.00 PM  
 Max.Marks: 60

**N.B.:**

- 1) All the questions are **COMPULSORY**.
- 2) Figure to the right indicates **FULL** marks.
- 3) Draw the neat and labeled diagram **WHEREVER** necessary.
- 4) Assume suitable data, if necessary.

**Q.1** For the information source given draw the tree diagram and the probabilities (10)  
 of messages of lengths 1, 2, 3.



Source given emits one of three symbols A,B and C

**OR**

Explain Mark-off statistical model for information source (10)

**Q.2** Explain Mathematical model for Discrete communication channels (10)

**OR**

A binary channel has the following noise characteristics (10)

P(Y/X)		Y	
		0	1
X	0	2/3	1/3
	1	1/3	2/3

If the input symbols are transmitted with probabilities  $\frac{3}{4}$  and  $\frac{1}{4}$  respectively,  
 Find  $H(X)$ ,  $H(Y)$ ,  $H(XY)$ ,  $H(Y/X)$ .

**Q.3** Explain Shannon-Fano coding. (10)

**OR**

Explain Huffman coding.

**Q.4** Find the generator polynomial of triple code correcting BCH code with block (10)  
 length  $n=31$  over  $GF(2^5)$ .

**OR**

Explain circuit implementation of cyclic codes.

**Q.5** Explain Viterbi decoding of convolution codes (10)

**OR**

Explain turbo codes and turbo decoding. (10)

**Q.6** State and Explain applications of coding technique in cryptography. (10)

**OR**

Explain application and use cases of ITCT. (10)