

**B.TECH. SEM -V INFO. TECH. 2014 COURSE (CBCS) :**  
**SUMMER - 2018**  
**SUBJECT: ELECTIVE-I 4) INFORMATION THEORY & CODING**

**Day: Friday**  
**Date: 25/05/2018**

**S-2018-2364**

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

**N.B:**

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Use of non-programmable **CALCULATOR** is allowed.
- 4) Draw neat and labeled diagrams **WHEREVER** necessary.

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**Q.1** Explain average information contents of symbols in long independent sequences and long dependent sequences. **(10)**

**OR**

**Q.1** Explain Information Theory, uncertainty and information, number theory. **(10)**

**Q.2** Explain Shannon's encoding algorithm **(10)**

**OR**

**Q.2** Explain information capacity theorem, Entropy and information rate of mark-off source. **(10)**

**Q.3** Encode string COMPUTER ENGINEERING using Shannon-Fano algorithm. **(10)**

**OR**

**Q.3** Explain Lempel-ziv algorithm. **(10)**

**Q.4** Explain generator polynomial for BCH codes for  $m = 4, t = 3$ , BCH code over  $GF(2^4)$ . **(10)**

**OR**

**Q.4** Explain Polynomials and division algorithm for polynomials. **(10)**

**Q.5** For the data  $k=1, n=2, k=3$  Find **(10)**

- 1) Convolution code.
- 2) State diagram representation.
- 3) Trellis diagram representation.
- 4) Encoding using Trellis representation.

**OR**

**Q.5** Explain Turbo codes and Turbo decoding. **(10)**

**Q.6** What is TCM? Explain example of TCM and Ungerboeck's TCM design rules. **(10)**

**OR**

**Q.6** Consider 8-PSK channel signals with  $E |a_{n2}| = 1$  using mapping by set partitioning. **(10)**