



(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 131408

Roll No.

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B. Tech.

(SEM. IV) THEORY EXAMINATION, 2014-15 INFORMATION THEORY AND CODING

Time : 3 Hours]

[Total Marks : 100

SECTION-A

- 1 Attempt any four parts : **5×4=20**
- What do you mean by measure of information?
 - Give a review of probability theory.
 - Explain Average information content of symbol in long independent sequence.
 - Consider a discrete memory less source alphabet $A=\{s_0,s_1,s_2\}$ with respective probabilities $P_0=1/4$, $P_1=1/4$, $P_2=1/2$ find, the entropy of the source.
 - Show that if there are 'M' numbers of equally likely message then entropy of source is $\log_2 M$.
 - Explain Mark-off stastical model for information source in brief

SECTION - B

- 2 Attempt any four parts : **5×4=20**
- What do you mean by data compression and give its type ?

- b) Give an equation of Kraft-mcmillan equality and explain it.
- c) Write down Shanon's encoding algorithm.
- d) Write an algorithm for Shanon-fang-elias coding.
- e) Explain LZW compression algorithm with example.
- f) What is block code and write its properties.

SECTION-C

- 3 Attempt any two parts : 10×2=20
- a) Differentiate entropy and mutual information for continuous ensembles with suitable example.
 - b) Explain discrete communication channels in detail.
 - c) Write down channel capacity theorem.

SECTION-D

- 4 Attempt any two parts : 10×2=20
- a) Explain error correction and detection with examples.
 - b) Write a note on standard arrays and table look up for encoding.
 - c) What is an error? Give its types with example.

SECTION-E

- 5 Attempt any two parts : 10×2=20
- a) What is burst error correcting code and convolution code?
 - b) Explain the encoding using an (n-k) bit shift register.
 - c) Write short note on
 - i) BCH code
 - ii) GOLAY code.

