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FIFTH SEMESTER B.TECH. (ENGINEERING) DEGREE EXAMPLE DECEMBER 2008

EE 2K 502/PTEE 2K 403 ANALOG AND DIGITAL COMMUNICATION SYSTEM
Time : Three Hours
Maximum : 100 Marks

- I. (a) Define :
 - (i) Convolution.
 - (ii) Correlation.
 - (b) What is stationarity ? Explain.
 - (c) Derive the modulation Index of a frequency modulated wave.
 - (d) Briefly explain the operation of a Foster-Seeley Discriminator.
 - (e) Explain the modulation and demodulation of a PAM signal.
 - (f) Compare ASK, FSK and PSK.
 - (g) What are linear block codes?
 - (h) Briefly explain the various network topologies.

$(8 \times 5 = 40 \text{ marks})$

II. (a) State and prove the sampling theorem.

Or

- (b) Derive the response of an LTI system to White Gaussian noise.
- III. (a) (i) Derive the signal-to-noise ratio for an envelop detection.
 - (ii) With the advantages, explain any one single-stdeband generation technique.

Or

- (b) Derive an expression for the FM wave and prove that it has infinite number of sidebands using Bessel's function.
- IV. (a) (i) Explain in detail about the generation and detection of PWM wave.
 - (ii) Explain in detail about the Natural sampling and Flat-top sampling.

Or

- (b) Explain in detail about the :
 - (i) Synchronization.

(ii) Equalization.

Turn over

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(a) An analog signal band limited to 10 kHz is quantized in 8 levels of a PCM system with probabilities of $\frac{1}{4}$, $\frac{1}{5}$, $\frac{1}{5}$, $\frac{1}{10}$, $\frac{1}{20}$, $\frac{1}{20}$ respectively. Calculate the entropy and the rate of information.

Or

(b) Explain in detail about the various layers of an ISO-OSI model.

 $(4 \times 15 = 60 \text{ marks})$