

Code: 9A10505

B.Tech III Year I Semester (R09) Supplementary Examinations December 2015

**PRINCIPLES OF COMMUNICATIONS**

(Common to E.Con.E &amp; EIE)

Time: 3 hours

Max. Marks: 70

Answer any FIVE questions  
All questions carry equal marks

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- 1 (a) Find the Fourier transform of a periodic gate function with period  $T = 1/2$  and width  $\tau = 1/20$ .  
(b) Explain the power density spectrum & energy.
- 2 (a) Define modulation and give its need in communication systems.  
(b) Draw and explain the circuit diagram of a linear diode detector and derive a condition for choice of time constant.
- 3 Draw and explain the circuit diagram of the following FM detectors. Also give their merits and demerits:  
(a) Foster – Seeley discriminator.  
(b) Ratio detector.  
(c) Simple slope detector.
- 4 (a) Compare PWM and PPM.  
(b) What is the role of holding circuit in pulse modulation system?
- 5 (a) With neat block diagram, explain adaptive delta modulation and noise in delta modulation.  
(b) Explain the performance of binary and S-ary systems.
- 6 (a) With neat block diagram, explain the QPSK transmitter and receiver.  
(b) Explain differentially coherent PSK.
- 7 (a) What is the significance of Shannon limit? How can it be increased?  
(b) What is entropy? Show that the entropy is maximum when all the symbols are equi-probable, assume  $M = 3$ .
- 8 (a) What is coding efficiency? Show that the coding efficiency is maximum when  $P(0) = P(1)$ .  
(b) Encode the following for  $M = 4$ .  
 $[X] = [x_1 \ x_2 \ x_3 \ x_4 \ x_5 \ x_6 \ x_7 \ x_8]$   
 $[P(x)] = [0.2 \ 0.2 \ 0.15 \ 0.1 \ 0.1 \ 0.05 \ 0.05]$

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