

Code: 9A10505

**R9**

B.Tech III Year I Semester (R09) Supplementary Examinations, May 2013

**PRINCIPLES OF COMMUNICATIONS**

(Common to E.Con.E and EIE)

Time: 3 hours

Max Marks: 70

Answer any FIVE questions  
All questions carry equal marks

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- 1 (a) Explain the block diagram of electrical communication system.  
(b) Find whether the given signal is energy signal or power signal  $x(t) = 24 \omega \text{ sinc}(2 \omega t)$ . Also find its power/energy.
- 2 (a) With the aid of sketches explain operation of DSB modulator.  
(b) A channel has a uniform noise power density spectrum  $S_n(f) = 0.25 \times 10^{-3}$  watts/Hz. A DSB-SC signal with carrier frequency of 200 KHz, is transmitted over this channel. The modulating signal  $f(t)$  is band limited to 4 KHz. The power of this sideband signal is 5 KW. This incoming signal at the receiver is filtered through an ideal band pass filter before it is fed to the demodulator. Find what is the transfer function of this filter at receiver?
- 3 (a) Explain about the parameter variation method of FM generation.  
(b) Explain narrow band and wide band FM.
- 4 (a) State and explain the sampling theorem for band limited signal.  
(b) With suitable circuit diagram, explain the generation of PWM signal.
- 5 (a) Explain the principle of operation of ADM.  
(b) What are the different types of quantization techniques used in PCM system? Explain one.
- 6 (a) Explain the modulation and demodulation of non-coherent PSK system.  
(b) Write the differences between ASK, FSK, PSK QPSK.
- 7 (a) Write a short notes on:  
(i) Entropy. (ii) Redundancy. (iii) Channel capacity.  
(b) Derive the condition for the maximum entropy and find the maximum entropy of a source. Transmitting 3 messages  $M_1, M_2, M_3$  with respective probabilities of  $P_1, P_2, P_3$ .
- 8 (a) Design an encoder for a (7, 4) binary cycle, code with the generating polynomial.  $g(x) = 1 + x^2 + x^3$  and using the encoder find the code word for the message word 1110 and 0101.  
(b) What is difference between convolutional codes and linear block code?

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