ROLL NO. _____

Code: AE15 **Subject: COMMUNICATION ENGINEE**

AMIETE – ET (OLD SCHEME)

Time: 3 Hours **JUNE 2012** **Max. Marks: 1**

PLEASE WRITE YOUR ROLL NO. AT THE SPACE PROVIDED ON EACH PAGE IMMEDIATELY AFTER RECEIVING THE QUESTION PAPER.

NOTE: There are 9 Questions in all.

- **Question 1 is compulsory and carries 20 marks. Answer to Q.1 must be written in the space provided for it in the answer book supplied and nowhere else.**
- **The answer sheet for the Q.1 will be collected by the invigilator after 45 minutes of the commencement of the examination.**
- **Out of the remaining EIGHT Questions answer any FIVE Questions. Each question carries 16 marks.**
- **Any required data not explicitly given, may be suitably assumed and stated.**

Q.1 Choose the correct or the best alternative in the following: **(2×10)**

a. Recovering information from a carrier is known as

(A) demultiplexing **(B)** modulation
(C) demodulation **(D)** carrier recovery

b. Single sideband system require

(A) more band width **(B)** high power
(C) more modulation index **(D)** Complex Receiver Circuit

c. In a DM system, the granular noise occurs when the modulating signal

(A) increases rapidly **(B)** remains constant
(C) decreases rapidly **(D)** the nature of modulating signal has no effect on noise

d. A zero source generates two messages with prob 0.8 and 0.2 These are coded as 1 and 0. The code efficiency is

(A) 0.2 **(B)** 0.5
(C) 0.7 **(D)** 1.0

e. 13 dBm is equivalent to

(A) 2 mW **(B)** 20 W
(C) 20 mW **(D)** 2 W

f. For uniform quantization with 32 levels, the quantized output can be represented by a binary digits where n is

(A) 5 **(B)** 8
(C) 6 **(D)** 4

g. In forward error correction, if the data unit is 111111 and the divisor is 1010, them the dividend at the transmitter is

(A) 1111111000 **(B)** 1111111010
(C) 111111 **(D)** 1111110000

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h. Hamming code has a capability of

(A) Error detection **(B)** Error correction
(C) Error detection and correction **(D)** Error encapsulation

i. The probability density function of the envelope of narrowband noise is

(A) Poisson **(B)** Gaussian
(C) Rayleigh **(D)** Rician

j. The Ring Modulator is used for the generation of

(A) SSB-SC signal **(B)** DSB-SC signal
(C) FM signal **(D)** AM signal

Answer any FIVE Questions out of EIGHT Questions.
Each question carries 16 marks.

Q 2. a. Differentiate between analog and digital signals. **(4)**

b. Draw and explain block diagram of a communication system. **(6)**

c. Find the mathematical representation of narrow band noise. **(6)**

Q 3. a. Explain the different types of internal noise in brief. **(8)**

b. Derive the expression for Noise in a two stage cascaded amplifier. **(8)**

Q 4. a. Define modulation index with respect to amplitude modulation. Derive the power relation and efficiency in A.M. modulated wave. **(10)**

b. Drive the mathematic expression for double sideband suppressed carrier. (DSB-SC) **(6)**

Q5. a. What will happen if a PM signal is received by an FM receiver and vice versa? Also describe the narrowband frequency modulation. **(8)**

b. If a sinusoidal message signal is modulated with modulation index of 0.4 and 0.5, then
(i) Find the efficiency of AM signal.
(ii) When 100% modulation is achieved. **(8)**

Q6. a. State and proof the sampling theorem for the low pass signals. **(8)**

b. Explain the principle of Adaptive delta modulation. How does it differ from delta modulation? **(8)**

Q7. a. Describe the Hamming code, Hamming distance and Entropy. **(8)**

b. A DMS X has five symbols x_1, x_2, x_3, x_4 and , x_5 with P (x_1) = 0.4 P (x_2) = 0.19, P (x_3) = 0.16, P (x_4) = 0.15 and P (x_5) = 0.1
Construct the Shannon-Fano code for X and calculate the efficiency of code. **(8)**

Q8. a. Describe the operation of a CW Doppler radar can we use a CW radar for range measurement? Discuss. **(8)**

b. Explain the importance of Blanking and synchronizing pulse in T.V transmission. **(8)**

Q9. Write short notes on

(i) Pulse Amplitude Modulation (PAM)
(ii) Optimum Receiver
(iii) SNR of PCM
(iv) Channel capacity of a Gaussian channel **(4×4)**