Roll No .....

CS/IT/EE-405 (GS)

B.E. IV Semester Examination, June 2020

Grading System (GS)

Analog and Digital Communication

Time : Three Hours

Maximum Marks : 70

Note: i) Attempt any five questions.
ii) All questions carry equal marks.

1. Define modulation index for FM and PM and obtain the relation between modulation index and modulating signal for FM and PM.

2. Determine the Power Spectral Density (PSD) of a random process whose autocorrelation function is given as Ra (t) = A2/2.

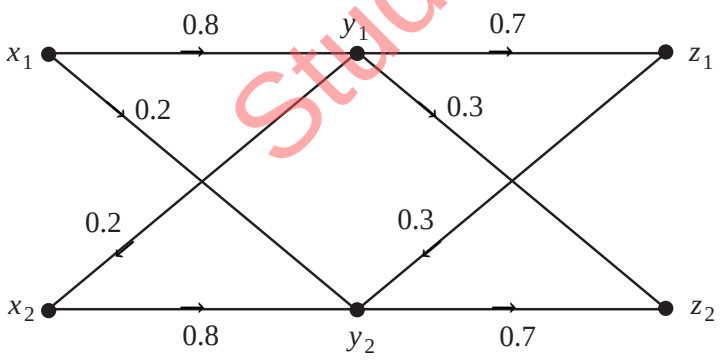
3. An Amplitude Modulated wave:

   $10\left[1 + 0.6\cos 2\pi 10^3 t\right]\cos 2\pi 10^6 t$ is to be detected by a linear diode detector Find:

   i) The time constant τ
   ii) The value of resistance R if the capacitor used is 100pF

4. Write short notes on:
   i) Companding
   ii) Quantization

5. Find the Channel Capacity of the cascaded channel shown in Fig.



6. How the phase changes in QPSK? Explain in detailed, also discuss advantages and disadvantages of QPSK.

OR

Draw and explain the circuit diagram of a envelope detector and derive the condition for choice of time constant.

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7. With a block diagram, explain the adaptive Delta Modulation technique.

OR

Prove the following :

i) $r_{xy}(1) = r_{yx}(-1)$

ii) $r_{xy}(1) = x(1)^{*} y(-1)$

8. Answer any three of the following :

a) Explain causal and non-causal systems.

b) State convolution theorem.

c) Draw the amplitude modulation wave forms with modulation Index m = 1, m<1,m>1.

d) Construct NRZ and RZ format for 011010.

e) Sketch the waveform of PSK for binary sequence 1100101.

f) Distinguish between a cyclic code and convolutional code.

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