

PRINCIPLES OF COMMUNICATIONS

(Electronics and Instrumentation Engineering)

Time: 3 hours

Max. Marks: 70

PART – A
(Compulsory Question)

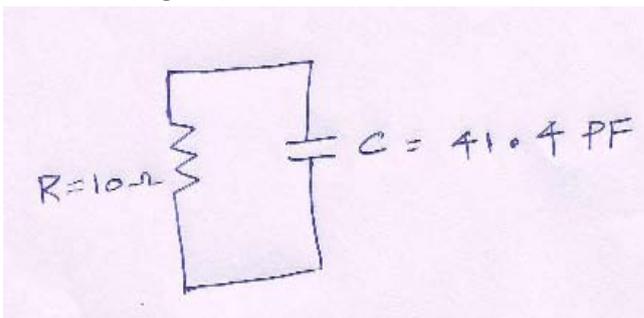
- 1 Answer the following: (10 X 02 = 20 Marks)
- Draw the block diagram of electrical communication system.
 - List the types of fluctuation noise.
 - Define modulation index for amplitude modulation.
 - List the advantages of SSB-SC modulation over DSB-SC modulation.
 - Draw the circuit diagram for zero order hold circuit.
 - What is meant by aliasing effect?
 - Why ASK is called as ON-OFF keying?
 - Define quantization error.
 - An event has six possible outcomes with the probabilities $P_1 = 1/2$, $P_2 = 1/4$, $P_3 = 1/8$, $P_4 = 1/16$, $P_5 = 1/32$ and $P_6 = 1/32$. Find the entropy of the system.
 - Mention the methods used for error correction.

PART – B

(Answer all five units, 5 X 10 = 50 Marks)

UNIT – I

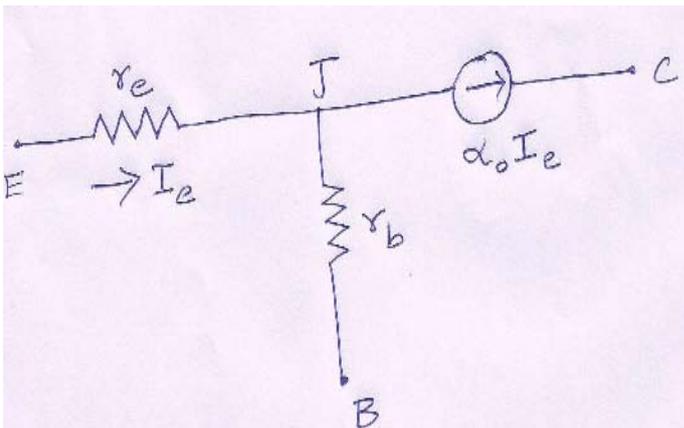
- 2 (a) Find the root mean square value of the noise voltage at 27°C developed across the capacitor terminal of the circuit given below.



- (b) Explain in detail about resistor noise.

OR

- 3 Determine the various noise sources of a common base transistor amplifier is shown in figure below.



UNIT – II

- 4 (a) Draw and explain the block diagram of squaring loop.
(b) Explain in detail about the frequency discrimination method and its limitations for generation of SSB-SC signals.

OR

- 5 (a) A single tone modulating signal $f(t) = E_m \cos \omega_m t$. Find the frequency deviation.
(b) Compare between amplitude modulation and frequency modulation.

UNIT – III

- 6 State and explain sampling theorem for band limited signals.

OR

- 7 (a) Compare FDM and TDM technique.
(b) Explain the generation of pulse position modulation using PPM modulator circuit.

UNIT – IV

- 8 Explain in detail about QPSK transmitter and receiver with neat sketches.

OR

- 9 (a) Explain the block diagram of transmitter and receiver for pulse code modulation.
(b) Write notes on limitations of delta modulation.

UNIT – V

- 10 Find the average code word length and coding efficiency for the message with eight probabilities $P_0 = 1/4, P_1 = 1/8, P_2 = 1/16, P_3 = 1/16, P_4 = 1/16, P_5 = 1/4, P_6 = 1/16, P_7 = 1/8$ using Shannon Fano coding.

OR

- 11 Find all the code vectors for the generator polynomial of a (7, 4) cyclic code is $g(x) = 1 + x + x^3$.
