**5E3104-P**

B. Tech. (Sem. V) (Main/Back) Examination, December - 2011
**Electrical & Electronics**
**5EX4 Analog Communication (Common with 5AI4 & 5EC4)**

Time : **3** Hours]

[Maximum Marks : **80**
[Min. Passing Marks : **24**

*Instructions to Candidates :*

*Attempt any **five questions** selecting **one question** from each*
***unit**. All questions carry **equal** marks. Schematic diagrams must*
*be shown wherever necessary. Any data you feel missing suitably*
*be assumed and stated clearly. Units of quantities used/calculated*
*must be stated clearly.*

Use of following supporting material is permitted during examination.
*(Mentioned in form No. 205)*

1. ___NIL___                    2. ___NIL___

## UNIT - I

1  (a)  Explain the different types of noise in communication system.
How we can reduce it ?

10

(b)  A resistor 25 K$\Omega$ is connected to input of amplifier. The
amplifier is performing at the frequency range of 11 to
12 MHz. Determine the rms noise voltage at input of amplifier
if ambient temperature is 25°C.

6

### OR

1  (a)  Define the noise figure and noise temperature. Calculate
noise figure and equivalent noise temperature of cascaded
stage.

10

(b)  A receiver with 5 dB noise figure, 10 dB gain and 50 kHz
noise band width is connected to an antenna that has noise
temperature of 1050 K. Calculate the overall noise figure.
(if reference temp. is 20°C).

6
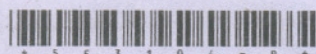
# UNIT - II

2 (a) Derive the equation and power relation in AM system. Compare AM, DSBSC and SSB transmission.

12

(b) A broad cast radio transmitter is 12 kW when modulation percentage is 65%. What will be the side band power ?

4

## OR

2 (a) With the help of block diagram explain the AM Receiver. Also compare it with FM Receiver.

12

(b) The antenna current of transmiter is 11.5 Amp when it is modulated to a depth 45% by audio sine wave. Determine unmodulated (carrier) current.

4

# UNIT - III

3 (a) Compare AM, FM and PM.

8

(b) A FM voltage is given as
$V = 15 \sin (6.5 \times 10^8 t + 5.55 \sin 1260\, t)$

Determine

(i) Modulating and carrier frequency

(ii) Modulation index and FM band width.

8

## OR

3 (a) Explain the principle of generation and detection of FM signal. Explain one method of FM detection in detail.

10

(b) Explain Preemphasis and Deemphasis.

6

# UNIT - IV

4  (a)  Calculate S/N ratio of square law demodulates and envelope detector.

12

(b)  A FM broad cast system with max. deviation of $= 75$ kHz and band width B $= 15$ kHz. Assume power spectral density $S_x = 1/2$, find the output SNR and calculate improvement (IndB) over base band system.

4

## OR

4  Calculate the signal to noise ratio (S/N) in AM (DSBFC), FM and PM and compare it.

6+5+5=16

# UNIT - V

5  Write short notes on following :

(a)  Sampling

(b)  Pulse amplitude modulation (PAM).

8×2=16

## OR

5  Write short notes on following :

(a)  Pulse width modulation (PWM)

(b)  Pulse position modulation (PPM).

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