* R N - 6 8 0 3 / 5 0 0 *

RN-6803

B. E. (Sem. V) (Electrical) Examination

May / June – 2010

Communication Engineering

Time : **3** Hours] [Total Marks : **100**

Instructions :

(1)

નીચે દર્શાવેલ ☛ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
Fillup strictly the details of ☛ signs on your answer book.

Name of the Examination :

☛ **B. E. (Sem. 5) (Electrical)**

Name of the Subject :

☛ **Communication Engineering**

☛ Subject Code No. : **6 8 0 3** ☛ Section No. (1, 2,.....) : **1&2**

Seat No. :

Student's Signature

(2) Attempt all questions.

(3) Figures to the right indicate full marks.

(4) Assume suitable data whenever necessary.

(5) Use scientific calculator fx 82/83/100 or equivalents.

SECTION - I

1 Answer the following :

(a) (MCQ type 10 × 1) = **10**

(i) In a communication system, noise is most likely to affect the signal

(a) at the transmitter

(b) in the information source

(c) in the channel

(d) at the receiver

(ii) The value of resistor creating thermal noise is doubled. The noise power generated is therefore

(a) Doubled (b) Quadrupled

(c) Unchanged (d) Halved

(iii) Indicate the 'false' statement. An amplitude modulated signal contains

(a) W_c (b) $W_c + W_m$

(c) $W_c - W_m$ (d) W_m

(iv) If the carrier of 100% modulated AM wave is suppressed, the percentage power saving will be

(a) 100 (b) 50

(c) 150 (d) 66.67

(v) Theoretically the bandwidth required for a frequency modulated signal is

(a) Double the modulating signal frequency

(b) Equal to the modulating signal frequency

(c) Ten times the modulating signal frequency

(d) Infinite

(vi) Indicate which one of the following systems cannot be used to remove the unwanted sideband in SSB

(a) Phase-shift method

(b) Weaver's method

(c) Balanced modulator

(d) Filter method

(vii) Sensitivity of superheterodyne receiver is governed by

(a) both R.F. and I.F. section

(b) only R.F. section

(c) only I.F. section

(f) Only audio section

(viii) Indicate which one of the following is not an advantage of FM over AM.

(a) Lower Bandwidth is required

(b) The transmitted power is more useful

(c) Better noise immunity is provided

(d) Less modulating power is required.

(ix) Bandwidth of amplitude modulated signal is given by

(a) w_m

(b) $2 \cdot w_m$

(c) w_c

(d) $2 \cdot w_c$

(x) Thermal noise power (P_n) is given by

(a) $K \cdot T \cdot B_n$

(b) $\sqrt{4 \cdot R \cdot K_T \cdot B_n}$

(c) $4 \cdot G \cdot K_T \cdot B_n$

(d) None of the above

(b) Answer the following :

(i) What is demodulation? Write detectors used for demodulation of AM signal.

(ii) Write an expression for AM wave.

(iii) What is transmission Bandwidth for F.M. ?

(iv) What do you mean by the term "Noise" used in communication system.

(v) What are the main functions of Radio Receiver?

2 Answer the following :

(a) Explain in detail phasing method for the generation of SSB signals. Also state its Advantages and dis-advantages. **7**

(b) (i) Derive for current content in AM wave. **3**

(ii) The antenna current of AM transmitter is 8 Amp, if only the carrier is sent, but it increases to 8.93 Amp, if the carrier is modulated by a single sinusoidal wave. Determine the percentage modulation. Also find the antenna current if the percent of modulation changes to 0.8.

OR

(a) Explain each block of superheterodyne radio receiver and also draw a wave form at each point. **7**

(b) What is sinusoidal FM? Explain in detail. Also derive for average power in sinusoidal F.M. **8**

3 Attempt any **three** : **5×3=15**

(i) In a casecade two stage amplifier first stage has a noise figure of 2dB and a power gain of 12 dB. The second stage has a noise figure of 6dB and a power gain of 10 dB. Find the overall noise figure in dB.

(ii) Write a short note on AGC.

(iii) Write a short note on Envelope Detector.

(iv) Write a short note on generation of SSB signal using third method.

(v) Write a short-note of pre. emphasis and de-emphasis.

SECTION - II

4 Answer the following : (any **four**) **20**

(a) What are the different modulation techniques in digital communiction? Explain any one.

(b) Explain satellite attitude control.

(c) Explain any one light source for optical fiber.

(d) What is the working principle of cathode ray tube?

(e) Explain working principle of RADAR with necessary block diagram.

5 (a) Draw and explain block diagram of colour TV. **10**

(b) Explain working principle of colour TV picture tube. **5**

OR

5 (a) Discuss factors that will affect the radar range. **8**

(b) Explain uplink power budget calculation for satellite with necessary derivations. **7**

6 Write short notes : (any **three**) **15**

(a) Losses in fibers

(b) Photo detector

(c) CW RADAR

(d) Radio aids to navigation

(e) Multiple access methods.
