UTHM
Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER II
SESSION 2015/2016

COURSE NAME	:	ELECTRONIC COMMUNICATION SYSTEM
COURSE CODE	:	BNR 20903
PROGRAMME	:	BND
EXAMINATION DATE	:	JUNE / JULY 2016
DURATION	:	2 HOURS 30 MINUTES
INSTRUCTION	:	ANSWER **ALL** QUESTIONS

THIS QUESTION PAPER CONSISTS OF **FOUR (4)** PAGES

Q1 (a) For a three stage system $P_{in} = -30dB_m$ and power gains of the three stages as $AP_1 = 20dB$, $AP_2 = 10dB$, and $AP_3 = -8dB$. Determine the output power in dBm and watts.

(6 marks)

(b) Discuss the difference between correlated noise and uncorrelated noise

(4 marks)

(c) Two resistors of 20 kΩ and 50 kΩ are at room temperature (290 K). For a bandwidth of 100 kHz, calculate the thermal noise voltage generated by

(i)   each resistor
(ii) the two resistor in series
(iii) the two resistor in parallel

(15 marks)

Q2 (a) A carrier signal with a peak voltage of 2.0 V is amplitude modulated with a 10 kHz sine wave. The modulation voltage has an effective value of 750mV. Compute the following:

(i)   The percent modulation, M
(ii) The instantaneous voltage of the positive and negative envelope when the 10 kHz sine has completed 68 μs of its cycle.
(iii) Sketch the resulting AM waveform

(10 marks)

(b) For a Binary Phase Shift Keying (BPSK) modulator with an input bit rate if 8 Mbps and a carrier frequency of 90 MHz.

(i)   Determine the maximum and minimum upper and lower side frequencies
(ii) Draw the output spectrum.
(iii) Determine the minimum bandwidth

(9 marks)

(c) Modulation is an important process in electronic communication system. Without modulation process, transmitting signal to receiver is impractical. Discuss why?

(6 marks)

Q3 (a) A piece of RG-59B/U coaxial cable has a 80 Ω characteristic impedance and a nominal capacitance of 72 pF/m.

(i) What is its inductance per meter?
(ii) If the diameter of the inner conductor is 0.584 mm, and the dielectric constant of the insulation is 2.23, what is the outer conductor diameter?

(9 marks)

(b) Based on a Smith Chart, determine the input impedance and VSWR for a transmission line 1.35λ long with a characteristic impedance Z_0=50 Ω and a load impedance Z_L=30 – j40 Ω

(16 marks)

Q4 (a) Discuss why in public system switched telephone network, pulse code modulation is a preferable method for communication.

(6 marks)

(b) Briefly explain what are:

(i) Digitization
(ii) Sampling
(iii) Quantization

(9 marks)

(c) The analogue signal with frequency of 4 kHz, Maximum and minimum voltage of 8 V and -4 V respectively is sampled with the sampling frequency which is 50% higher than the minimum sampling frequency of the Nyquist rate. The bit rate of this Pulse code modulation (PCM) transmission is fixed at 24 kbps.

(i) Determine the quantization level

(4 marks)

(ii) Based on the quantization level that you state in (i), calculate the corresponding voltage for each quantization level.

(4 marks)

(iii) Calculate the bandwidth, BW

(2 marks)

- END OF QUESTION -