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UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER II
SESSION 2016/2017

COURSE NAME	:	ELECTRONIC COMMUNICATION SYSTEM
COURSE CODE	:	BNR 20903
PROGRAMME	:	BND / BNF
EXAMINATION DATE	:	JUNE 2017
DURATION	:	2 HOURS 30 MINUTES
INSTRUCTION	:	ANSWER **ALL** QUESTIONS

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

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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)   Determine the difference between guided and unguided transmission medium in electronic communication system?

(4 marks)

(c)   A carrier signal with a peak voltage of 2.0V 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

(3 marks)

(ii)   The instantaneous voltage of the positive and negative envelope when the 10 kHz sine has completed 68µs of its cycle.

(3 marks)

(iii)   Illustrate the resulting AM waveform

(3 marks)

(d)   Briefly explain the folowing terms:

(i)   Electronic communication
(ii)   Susbsystem sychronization
(iii)   Transmission impairments

(6 marks)

Q2   (a)   For a Binary Phase Shift Keying modulator with an input bit rate of 8 Mbps and a carrier frequency of 90 MHz,

(i)   determine the maximum and minimum upper and lower side frequencies,

(3 marks)

(ii)   draw the output spectrum,

(3 marks)

(iii)   determine the minimum bandwidth.

(3 marks)

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

(6 marks)

(c)   For three cascaded amplifier stages, each with noise figures of 3 dB and power gains of 10 dB, determine the total noise figure.

(10 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. Determine its inductance per meter. If the diameter of the inner conductor is 0.584 mm, and the dielectric constant of the insulation is 2.23, determine the outer conductor diameter?

(9 marks)

(b)   Based on a Smith Chart, determine the input impedance and VSWR for a transmission line 1.12λ long with a characteristic impedance Z_0=20 Ω and a load impedance Z_L=20 + j60 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 the following:

(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 **Q4** (c) (i), calculate the corresponding voltage for each quantization level.

(4 marks)

(iii) Calculate the bandwidth, BW

(2 marks)

- END OF QUESTIONS -