

Course No: ITGD3101
Course Title: Modern
Telecommunications
Date: 25 / 03/ 2012
No. of Questions: 3
Time: 1 hour
Using Calculator (YES)

University of Palestine



Midterm Exam
2nd semester 2011/2012
Total Grade: 100

Instructor Name: Dr. Anwar
Mousa

Student No.: _____

Student Name: _____

College Name: Faculty of
Information Technology

Dep. / Specialist: _____

Using Dictionary (No)

• Answer all Questions

First Question **No. of Branches (2)** **(35/100)**

Q1 B1 **(15/35)**

According to Nyquist criterion, calculate the transmission bandwidth for a signal with a pulse transmission rate of 200K symbol/sec using a roll-off factor of 25%.

Q1 B2 **(20/35)**

A signal $x(t)$ has a bandwidth of 10KHz. The signal is tried to be reconstructed from its samples? Explain what will happen if the sampling frequency was equal to:

- a. 18000 sample/sec
- b. 20000 sample/sec
- c. 24000 sample/sec

Second Question **No. of Branches (2)** **(35/100)**

Q2 B1 **(20/35)**

- a. Explain how we could achieve a DC Null in PSD for Polar line code by pulse shaping.
- b. Discuss the advantages and disadvantages of a bipolar line code.

Q2 B2 **(15/35)**

Compare bipolar and polar line codes in terms of spectrum efficiency, transparency, error detection and timing.

Third Question **No. of Branches (1)** **(30/100)**

Q3 B1

The maximum quantization error in the sample amplitude is 0.2% of the peak amplitude m_p for a signal $g(t)$ with bandwidth equals 20 kHz. The signal is sampled at a rate 25% higher than the Nyquist rate. Find the minimum bandwidth of a channel required to transmit the encoded signal if the quantized samples are binary coded. If a group of 30 such signals are time-division-multiplexed, calculate the minimum transmission bandwidth needed to transmit this group of signals.

End of Questions

Good Luck