

Course No: ITGD3101
Course Title: Modern
Telecommunications
Date: 28 / 11/ 2010
No. of Questions: 3
Time: 1 hour
Using Calculator (YES)

University of Palestine



Midterm Exam
2nd quadmester
2010/2011
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 **(20/35)**

- a. A scrambler is used in some communication systems, explain clearly its function and benefits.
- b. A signal $x(t)$ has a bandwidth of 5MHz . Calculate the maximum sampling interval and the minimum sampling frequency if the signal is to be reconstructed exactly from its samples?

Q1 B2 **(15/35)**

Evaluate the transmission bandwidth for a signal with a pulse transmission rate of 100Kb/s using a roll-off factor of 35% according to Nyquist criterion.

Second Question **No. of Branches (2)** **(30/100)**

Q2 B1 **(15/30)**

Discuss the advantages and disadvantages of a bipolar line code.

Q2 B2 **(15/30)**

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

Third Question **No. of Branches (1)** **(35/100)**

Q3 B1

A signal $g(t)$ with bandwidth equals 12kHz , is sampled at a rate 40% higher than the Nyquist rate. The maximum quantization error in the sample amplitude is 0.2% of the peak amplitude m_p . Find the minimum bandwidth of a channel required to transmit the encoded signal if the quantized samples are binary coded. If a group of 20 such signals are time-division-multiplexed, calculate the minimum transmission bandwidth needed to transmit this group of signals.

End of Questions

Good Luck