

Course No: ITGD3101
 Course Title: Modern
 Telecommunications
 Date: 18 / 01/ 2011
 No. of Questions: 4
 Time: 2 hours
 Using Calculator (YES)

University of Palestine



FINAL Exam
 2010/2011
 Total Grade: 100

Instructor Name: Dr. Anwar
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 Student No.: _____
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 College Name: Faculty of
 Information Technology
 Dep. / Specialist: _____
 Using Dictionary (No)

• *Answer all Questions*

First Question	No. of Branches (4)	(30/100)
Q1 B1		(10/30)
Baseband signals can not be transmitted over a radio link or satellites! Explain the reason and propose a solution for this problem.		
Q1 B3		(20/30)
Compare multi-amplitude (M-ary) signaling with binary signaling in terms of a. data rate b. bandwidth c. power		
Second Question	No. of Branches (2)	(30/100)
Q2 B1		(10/30)
For the following two vectors: X(3, -4, 0.5, 0), Y(-2, -1.5, 0, 7.5) Calculate the scalar product and describe the relationship between them.		
Q2 B2		(20/30)
a. Represent the following signals on two dimension signal space: S ₁ = (1, -2.5), S ₂ = (-0.5, 1), S ₃ =(0, -1) and S ₄ = (2.5, 1). b. Find two orthogonal signals and verify their orthogonality on signal space. c. Find the energy of S ₃ .		
Third Question	No. of Branches (1)	(20/100)
Q2 B1		(20/20)
For a (6, 3) code, the generator matrix G is		
$G = \left[\begin{array}{ccc ccc} 1 & 0 & 0 & 1 & 0 & 1 \\ 0 & 1 & 0 & 0 & 1 & 1 \\ 0 & 0 & 1 & 1 & 1 & 0 \end{array} \right]$ <div style="display: flex; justify-content: center; gap: 20px; margin-top: -10px;"> <div style="text-align: center;">I_k</div> <div style="text-align: center;">P</div> </div>		
Find the corresponding code words for the following data words: a. d=011 b. d=001		
Fourth Question	No. of Branches (1)	(20/100)
Q4 B1		(20/20)
Find the detection error probability for: Bipolar, Polar and On-Off signaling if a peak pulse amplitude $A_p=5.5$ milli-volt and the channel noise rms value = 192.3 micro-volt (1 and 0 are equally likely and threshold detection is used).		

End of Questions

Good Luck