King Saud University
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Department of Electrical Engineering

Communication Systems EE424	Prof. Adel Ahmed Ali adelali@ksu.edu.sa

Test #1 **Time: 45 minutes** **March 16, 2006**

Student Name ID

Each question is assigned two marks.

1. Contrast bit rate and Symbol rate. What is the relation between the two rates?
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2. A 100 kHz base-band channel is used by a digital transmission system. Ideal pulses are sent at the Nyquist rate, and the pulses can take 16 levels. What is the bit rate of the system?
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3. Suppose we wish to transmit at a rate of 40 kbps over a 3 kHz telephone channel. What is the minimum SNR required to accomplish this?
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4. What are the differences between subscriber and trunk lines signals?
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5. Compare Cat4 and Cat5 TP cables for data rate, application, and bandwidth
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6. Compare TP and Fiber for cost, performance and application
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7. Frequency reuse is maximized by increase the size of cells: (True False)

8. TP attenuation is (0.2 1 10 100) and for optical fibre (0.2 1 10 100) dB/km

9. Insert the DSL type: ADSL, CDSL, VDSL

Service	Download	Upload	Mode of Operation
-----DSL	1 Mbps	16—160 Kbps	Now ratified as DSL-lite. No splitters. One pair wire.
-----DSL	13—52 Mbps	1.5—6.0 Mbps	Fiber needed and ATM probably used.
------DSL	1.5--8.192 Mbps	16—640 Kbps	Different up and down speeds, one pair wire

10. An analog signal has a bandwidth of 2 MHz. If converted to a digital PCM format, what is the:
    a) sample rate ……..

    b) bit rate?……

11. Insert the proper code:
    (a) Narrowband, (b) Wideband, (c) Broadband

Integrated voice, high speed data, full motion color video, 1-to-100 Mbps (and greater)	
Voice, low speed data, Wide area coverage, 10-to-100 kbps	
Higher speed data, images, Wide area coverage, 100-to-1000 kbps	

12. What is the meaning of?
    i. 10BASE5……
    ii. 100BASE-T ……
    iii. 1000BASE-X ……

13. DSL use (PCM MQAM FM None) modulation

14. How much is the increase in attenuation (dB), when the link distance is doubled?

    i. Wireless (free space) link …… ……..
    ii. Twisted pair link ……..

15. State 2 good points and 2 bad points about this course