Nepal college of information technology

(Unit test)

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| Level: Bachelor | Semester- Fall- 2014 | Full Marks: 70 | |
| Programme: BE IT Morning and Day | | Pass Mark: 35 | |
| Course: Principal of Communication | | Time : 2hrs. | |
| *Candidates are required to give their answers in their own words as far as practicable.* | | |
| *The figures in the margin indicate full marks.* | | |
| Attempt all the questions. | | |

1. a) Draw and explain the block diagram of a digital communication system. In a discrete memory less communication system, a coded message source produces sequences of letter chosen from among the letters a, b, c, d with probabilities 0.2, 0.3, 0.4 and 0.1 respectively where successive symbols are chosen independently. What is the entropy per symbol? **(8)**

b) Explain channel capacity theorem.A Channel bandwidth of 9 KHz and a signal to noise ratio (S/N) of 85. Determine the bandwidth needed if the signal to noise ratio is reduced to 35. What will be the signal power required if the bandwidth is reduced to 4 KHz. **(7)**

2. a) Explain power spectral density and auto-correlation function of a signal.Write down the properties of Fourier Series. **(8)**

b) What will be the Fourier transform of the rectangular pulse or gate function shown in the figures? **(7)**

x(t) x(t)

1 1

-T/2 T/2 t T t

3. a) Differentiate between energy and power signals.Check whether x(t)=Acoswt is energy or power type signal. **(8)**

b) Explain the different types of Bandwidth of signals. **(7)**

4. a) Sketch the wave form and show how to generate PAM signals. **(8)**

b) State and prove sampling theorem. **(7)**

5. Write short notes on(any two) **(2\*5)**

a) Deterministic and Random signals

b) Aliasing

c) Propagation of Electromagnetic wave