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**Question Paper Code : 42449**

**B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2018**

**Fifth Semester**

**Electronics and Communication Engineering**

**EC2301 – DIGITAL COMMUNICATION**

**(Regulations 2008)**

**(Common to PTEC 2301 – Digital Communication for B.E. (Part-Time)**

**Fourth Semester – Electronics and Communication Engineering – Regulations 2009)**

**Time : Three Hours**

**Maximum : 100 Marks**

**Answer ALL questions**

**PART – A**

**(10×2=20 Marks)**

1. Draw a block diagram of a typical digital communication system.
2. Define the term Null-to-null bandwidth.
3. What is the Nyquist rate of sampling ?
4. What are the different types of analog encoders ?
5. For the binary data 0110100, what is the hamming weight ?
6. For the binary data 1011000, draw the unipolar and RZ signal.
7. What is meant by eye opening in the eye pattern ?
8. What is ISI ? How its eliminated ?
9. Draw a block diagram of QPSK modulator.
10. What is the spectral efficiency of an M-ary ASK ?

**PART – B**

**(5×16=80 Marks)**

11. a) Discuss the geometrical representation of signals in detail with neat sketch. (16)

**(OR)**

- b) Explain the mathematical models of communication channel in detail with neat block diagram. (16)

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12. a) Illustrate and describe the types of quantizer. Discuss the midtread and midrise type characteristics of uniform quantizer with a suitable diagram. (16)

(OR)

- b) Describe the comparison of different speech encoding methods with necessary diagrams. (16)

13. a) Derive and plot the power spectra of NRZ unipolar and bipolar format signals. (16)

(OR)

- b) Consider the (7, 4) linear block code whose geometric matrix is given below :

$$G = \begin{bmatrix} 1000:101 \\ 0100:111 \\ 0010:110 \\ 0001:011 \end{bmatrix}$$

- i) Find all the code vectors.  
ii) Find parity check matrix (H).  
iii) Find the minimum weight of the code. (16)
14. a) Describe the implement of the matched filter demodulator with a sample signal  $s(t)$  and its matched filter response  $h(t)$ . (16)

(OR)

- b) i) Describe how eye pattern is helpful to obtain the performance of the system in detail with a neat sketch. (8)  
ii) Explain the maximum likelihood detector with neat diagram. (8)

15. a) Describe the operation of modulation and demodulation of binary FSK signals. (16)

(OR)

- b) Describe the operation of ASK modulation and coherent ASK demodulation in detail. (16)