Total No. of Questions : 6]

SEAT No. :

P4897

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# T.E./Insem. - 148

## T.E. (Computer Engineering)

## DATA COMMUNICATION AND WIRELESS SENSOR NETWORK

## (2012 Pattern) (Semester - I)

*Time : 1 Hour]* *[Max. Marks : 30*

***Instructions to the candidates:***

1) ***Solve Que. 1 or 2, Que.3 or 4, Que. 5 or 6.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Assume suitable data if necessary.***
4) ***Figures to the right indicate full marks.***

***Q1)*** a) Encode the following binary data stream into polar (RZ, NRZ), Manchester and differential Manchester codes for given Data stream : 11100101. **[5]**

b) Give definitions: **[3]**

i) Baud rate.

ii) Bit rate.

iii) SNR.

c) Write a note on Zigbee. **[2]**

OR

***Q2)*** a) Explain what is meant by slope overload and granular noise distortion? Also explain how adaptive delta modulation improves system tolerance to slope overload. **[6]**

b) With the help of waveform, explain sampling, quantization and encoding. **[4]**

***P.T.O.***

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***Q3)*** a) Draw and explain diagram of Frequency Hopping Spread Spectrum (FHSS) and Direct Sequence Spread Spectrum (DSSS). **[6]**

b) Consider Stop-and-wait ARQ system, the bandwidth of the line is 01 Mbps and 1 bit takes 20ms to make a round trip. What is the bandwidth-delay product? If the system data frames are 1000 bits in length. What is the utilization percentage of the link? **[4]**

OR

***Q4)*** a) A pure ALOHA network transmits 200-bit frame on a shared channel of 200 kbps. What is the throughput if the system (all stations together) produces **[4]**

i) 1000 frames per second.

ii) 500 frames per second.

b) Explain stop and wait ARQ, GO back-n ARQ and selective repeat ARQ. Comment on the performance of each. **[6]**

***Q5)*** a) Explain block diagram of RFID reader and RFID Tag. **[4]**

b) Define sensor network? Draw basic architecture and list its applications. **[6]**

OR

***Q6)*** a) Explain typical sensing nodes architecture, how this sensing node is different from the nodes in other networks? **[6]**

b) Explain the use of sensors in Robots. **[2]**

c) What are advantages of RFID over bar code. **[2]**



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