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Total No. of Questions : 10]

SEAT No. :

P1752

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[Total No. of Pages : 3

T.E.(Computer Engineering)

DATA COMMUNICATION AND WIRELESS SENSOR NETWORK

( 2013Course) (310243) (Semester-I)

Time : 2.5 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) Question 1 2 3 4 (10 marks each). Solve either question 1 or Question 2 and Question 3 or Question 4.
- 2) Question 7 and 8 (18 Marks) solve any one.
- 3) Question 5,6,9,10(16 Marks each) solve either Question 5 or Question 6 and Question 9 or Question 10
- 4) Neat diagrams must be drawn wherever necessary.
- 5) Assume Suitable data if necessary.
- 6) Figurs to the right indicate full marks.

Q1) a) We have four sources, each creating 250 characters per second. If the interleaved unit is a character and each synchronizing bit is added to each frame find [6]

- i) The data rate of each frame
- ii) The duration of each character in each source
- iii) The frame rate
- iv) The duration of each frame
- v) The number of bits in each frame
- vi) The data rate of the link

b) Explain RFID Based Data Communication [4]

OR

Q2) a) Write key Definitions of following components of Sensor Networks

- i) Sensor
- ii) Sensor Node
- iii) Routing
- iv) Data Centric routing
- v) Collaborative processing
- vi) Localization and tracking

[6]

b) Explain the Scrambling technique in encoding . What are different types of scrambling techniques? [4]

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**Q3) a)** Explain ALOHA, SLOTTED ALOHA and CSMA/CD, Comment on the efficiency of each random access technique. [6]

b) Write short note on:

i) Bluetooth architecture

ii) Virtual private networks. [4]

OR

**Q4) a)** Explain stop and wait ARQ, GO back-n ARQ and selective repeat ARQ. Comment on the performance of each. [6]

b) Explain in detail Delta modulation. Draw block diagram of delta modulator and demodulator, What are its advantages on PCM. [4]

OR

**Q5) a)** Define the following related to WSN and explain in brief

i) Unit node identifier

ii) Mach address

iii) Resource Identifier

iv) Network indentifier [8]

b) With the help of detail flow schematic diagram explain

i) Slotted CSMA-CA protocol.

ii) CSMA-CD protocol [8]

**Q6) a)** Explain the concept of low duty cycle protocol with wakeup period Also explain how it differs from Sparse Topology and Energy Management (STEM) Protocol. [8]

b) Explain the following with respect to WSN

i) Forward Error Correction (FEC)

ii) Block Coded FEC

iii) Convolutional codes

iv) Interleaving [8]

**Q7) a)** Explain the concept of range based localization in WSN

Explain "Range based" localization with distance measurement giving example. [8]

b) Explain following terminologies related to attribute based routing in WSN [6]

- i) Direct diffusion
- ii) Rumor Routing
- iii) Geographical hash tables

c) Enlist different routing challenges in WSN and Enlist the design issues in WSN? [4]

OR

Q8) a) Explain in brief: [8]

- i) PICONET
- ii) Tunneling protocol

b) What are different types of routing strategies/ protocols [6]

c) Write a short note on :

- i) SPIN-PP
- ii) SPIN-EC [4]

Q9) a) Write short note on:

- i) Tiny OS
- ii) Magnet OS [8]

b) What do you mean by Content Delivery Network (CDN)? What are different services provided by CDN? [8]

OR

Q10) a) Explain with the help of suitable architectural diagram of Nano-RK OS [8]

b) Write short notes on:

- i) Task driven Sensing
- ii) LiteOS [8]

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