C.U.SHAH UNIVERSITY
Summer Examination-2017

Subject Name : Industrial Data Communication

Subject Code : 4TE07IDC1   **Branch: B.Tech (IC)**

Semester : 7   Date : 31/03/2017   Time : 02:30 To 05:30   Marks : 70

Instructions:
   (1) Use of Programmable calculator & any other electronic instrument is prohibited.
   (2) Instructions written on main answer book are strictly to be obeyed.
   (3) Draw neat diagrams and figures (if necessary) at right places.
   (4) Assume suitable data if needed.

Q-1   **Attempt the following questions:**   **(14)**

  a) Which type of fiber has the highest modal dispersion?   01
      A Step-index multimode   B Graded-index multimode
      C Step-index single mode   D Graded index single mode

  b) The core of optical fiber cable has a _____.   01
      A Lower refracted index than air   B Lower refractive index than the cladding
      C Higher refractive index than the cladding D Similar refractive index with the cladding

  c) Among the given OSI model layers, which OSI layer is not present in HART protocol   01
      communications?
      A Data link layer   B Network layer
      C Physical layer   D Application layer

  d) The alternating pulse modulation of AS-Interface is based on coding of…   01
      A Manchester-   B Manchester-II
      C Manchester-I   D Manchester-VII

  e) For multi-drop communication of HART protocol, the data transfer rate is…   01
      A 1200 baud   B 1250 baud
      C 1230 baud   D 1150 baud

  f) How many slave devices are allowable for new version of AS-Interface V2.1?   01
      A 31 slaves   B 32 slaves   C 64 slaves   D 62 slaves

  g) Give the difference between EIA-232 Interface Standard and EIA-485 Interface   01
      Standard.

  h) Mention the working of session layer in OSI model.   01

  i) Draw HART data link frame format.   01

  j) Enlist the tools required for the troubleshooting of fiber optic network.   01

k) Draw master-call up slave response frame of AS-interface.   01

l) Why the splicing enclosures are necessary for the fiber optic network?   01

m) Enlist two techniques for isolating one circuit from another in detail.   01

n) Define dispersion.   01

Attempt any four questions from Q-2 to Q-8

Q-2	**Attempt all questions**	**(14)**
a)	Explain the radio modem configuration in brief with necessary diagram.	07
b)	Explain various earthling configurations with its requirements.	07

Q-3	**Attempt all questions**	**(14)**
a)	Explain OSI model in detail with necessary diagram.	07
b)	Describe shielding techniques and explain one of them.	07

Q-4	**Attempt all questions**	**(14)**
a)	State and explain the parameters of fiber optic communication.	07
b)	Describe the types of noises in electrical coupling and explain one of them with necessary diagram.	07

Q-5	**Attempt all questions**	**(14)**
a)	Explain point-to-point and multi-point communication for HART protocol with necessary diagram.	07
b)	Describe the types of fiber optic cables in terms of refractive index.	07

Q-6	**Attempt all questions**	**(14)**
a)	Explain two wire multidrop network for RS-485 with necessary diagram.	07
b)	Write a short note on Modbus protocol.	07

Q-7	**Attempt all questions**	**(14)**
a)	Explain physical layer of AS-interface with various topologies.	07
b)	Explain poll mode and burst mode of HART communication.	07

Q-8	**Attempt all questions**	**(14)**
a)	Explain Profibus protocol stack with necessary diagram.	07
b)	Explain EIA-232 Interface Standard with necessary pin diagram.	07