

C.U.SHAH UNIVERSITY**Summer Examination-2018****Subject Name: Industrial Data Communication****Subject Code: 4TE07IDC1****Branch: B.Tech (IC)****Semester: 7****Date: 02/04/2018****Time: 10:30 To 01:30****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 of the following does not include the major characteristics of EIA-232 standards?
- | | | | |
|--------------------------------------|--------------------------------------|---|--|
| a) Electrical signal characteristics | b) Mechanical signal characteristics | c) Functional description of interchange circuits | d) Computational circuit Characteristics |
|--------------------------------------|--------------------------------------|---|--|
- b) How many transmitters and receivers are allowed to connect in EIA-485 balanced system?
- | | | | |
|------|-------|-------|------|
| a)64 | b) 16 | c) 32 | d) 8 |
|------|-------|-------|------|
- c) Which of the following is limitation of Modbus?
- | | | | |
|-------------------------------|------------------------|-------------------------------|--------------------|
| a)Single-master communication | b)Multivendor protocol | c)High speed at long distance | d) Public protocol |
|-------------------------------|------------------------|-------------------------------|--------------------|
- d) Physical layer of the HART protocol is based on....
- | | | | |
|--------|-----------------|-----------------|--------|
| a) FSK | b) 4-20 ma loop | c) Both a and b | d)None |
|--------|-----------------|-----------------|--------|
- e) In industries Profibus-PA is used at which Network
- | | | | |
|--------------------|-------------------|------------------|----------|
| a) Control network | b) Device network | c) Field network | d) None. |
|--------------------|-------------------|------------------|----------|
- f) What three things make up a Modbus frame?
- | | | | |
|------------------------------------|-----------------------------------|--|---------|
| A. address, function code and data | B. address, data transaction code | C. data, function code and window size | D. none |
|------------------------------------|-----------------------------------|--|---------|
- g) In RS-232 DTE stands for
- h) Modbus Plus is open source protocol. Is it true or false?
- i) TCP stands for
- j) Define: protocol.
- k) Define: Breakout Box



- l) How many version of ProfiBus protocol are available in industry?
- m) Give type of topology use for master to slave device communication
- n) Enlist forms of coupling of electrical noise in sensitive data communication circuits.

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

- Q-2 Attempt all questions (14)**
- a) Explain Physical Layer and operating characteristics of AS-i protocol. (07)
 - b) What are the features of smart instrumentation? Explain the industrial data communication with graphical representation. (07)
- Q-3 Attempt all questions (14)**
- a) Give: Types of optical fiber in detail. (07)
 - b) Discuss Gigabit Ethernet and it's design consideration. (07)
- Q-4 Attempt all questions (14)**
- a) Explain the Device net protocol with OSI layers. (07)
 - b) Draw and explain IPV-4 header.. (07)
- Q-5 Attempt all questions (14)**
- a) Explain briefly Fiber Optic cable parameters. (07)
 - b) Explain Media Access Control techniques of Data Link Layer of Profibus Protocol. (07)
- Q-6 Attempt all questions (14)**
- a) Explain physical layer and encoding technique of Foundation Field bus. (07)
 - b) Has physical interface been defined in Modbus protocol? Explain Modbus protocol structure. (07)
- Q-7 Attempt all questions (14)**
- a) Explain briefly Hart protocol and Draw HART point to point and Multidrop communication network (07)
 - b) Draw and Explain 20mA current loop interface hardware. (04)
 - c) Give block diagram of EIA-232 to EIA-485 converter. (03)
- Q-8 Attempt all questions (14)**
- a) Enlist out the common causes of industrial communication problems and write step wise procedure to troubleshoot the communication system. (08)
 - b) Explain the Null Modem connections. (03)
 - c) Discuss the requirement of Earthing and Grounding. (03)

