

C.U.SHAH UNIVERSITY

Summer Examination-2018

Subject Name : Control System Architecture

Subject Code : 4TE08CSA1

Branch: B.Tech (IC)

Semester : 8

Date : 24/04/2018

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.
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- Q-1 Attempt the following questions:** **(14)**
- a) Which of the following supports Functional Block diagram (FBD) structure?
a) PLC only
b) DCS only 01
c) Both a & b
d) None of these
- b) The 'A' in AI & AO in controller indicates _____.
a) Alarm
b) Analog 01
c) Analyser
d) None of these
- c) Distributed Control System is used for _____.
a) Small Area
b) Large Area 01
c) Medium Area
d) None of these
- d) Real time system have _____.
a) Deadline for the response
b) No deadline for the response 01
c) Both a & b
d) None of these
- e) RTOS means _____.
a) Real Time Operating System
b) Real Time Operator System 01
c) Repeat Time Operator System
d) None of these
- f) Higher-level programming is covered in _____.
a) IEC 8652:1995 standard 01
b) IEC 8652:2012 standard



- c) IEC 61131-3 standard
d) None of these
- g) Which of the following communication protocol supports both analog and digital?
a) HART
b) Modbus 01
c) Profibus
d) None of these
- h) Hybrid is a combination of which process?
a) Continuous
b) Discrete 01
c) Both a & b
d) None of these
- i) Programmable control system is also called _____.
a) Soft wire subsystem
b) Hard wire subsystem 01
c) Both a & b
d) None of these
- j) Which structure of controller is more preferred hardware or software? 01
- k) What do you mean by RTU? 01
- l) When DCS is preferred over PLC in industry? 01
- m) State the advantage of using DCS in industry. 01
- n) Give the full form of SCADA. 01

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

- Q-2 Attempt all questions (14)**
- a) Explain typical SCADA system and its hierarchy. 07
b) State the differences between DCS and SCADA. Draw the hardware structure layout for typical RTU. 07
- Q-3 Attempt all questions (14)**
- a) Describe the applications of DCS in power plant industry. 07
b) Write a note on 'Isolation and protection in automation system'. 07
- Q-4 Attempt all questions (14)**
- a) Explain with diagram the hardware structure of controller. 07
b) Write a note on 'Hierarchical structure of automation'. 07
- Q-5 Attempt all questions (14)**
- a) Discuss the structure of control sub system and explain various steps performed by it. 07



- b) Write note Hazard and Operability Studies (HAZOP). 07
- Q-6 Attempt all questions (14)**
- a) Explain briefly hybrid control strategy. 07
- b) List various components required in instrumentation sub-system for input switching instrumentation devices and explain their input/output relationship. 07
- Q-7 Attempt all questions (14)**
- a) Explain various displays available within DCS system. 07
- b) State the advantages and disadvantages of Centralized I/O (CIO), Remote I/O (RIO) and Fieldbus I/O (FIO). 07
- Q-8 Attempt all questions (14)**
- a) Explain different types of programming structure available in DCS. 07
- b) Write a note on Alarm management in DCS 07

