E/INST/SEM-VII/C-2019/ DEC. 2023

Paper / Subject Code: 42771 / Instrumentation Project Documentation & Execution

Duration 3 hours **Total marks 80**

Note:

1. **Question No.1 is compulsory**
2. **Solve any THREE questions out of remaining Four questions.**
3. **Figure to the right indicate full marks.**

Q. 1 Explain any four 20

a) Explain the different standards used in project documentation.

b) Explain the primary purpose of the process flow diagram.

c) Describe Cable scheduling

d) Explain the PUNCH list.

e) What is tender? List its types.

Q 2 a) Neatly draw and explain the P and ID diagram for tank level control scheme. 10

b) Draw and explain the electronic loop wiring diagram for the temperature control loop. 10

Q. 3 a) Explain the role of customer from project team. 10

b) Explain the importance of the specification sheet. Explain the specification sheet for the pressure transmitter. 10

Q.4 a) Draw installation Hookup diagram for DP transmitter and also prepare Bill of Material (BOM) 10

b) What are the main tasks of the system integrator? Discuss CFC in detail with suitable examples. 10

Q.5 a) Explain Pre-commission and commissioning. Explain in detail all the activities carried out during commissioning. 10

b) Write short notes on procurement methods and procedure. 10

Q.6 Write a short note on (ANY TWO) 20

a) Checkout procedure for temperature transmitter and control valve.

b) Draw and explain the instrument location plan with an example.

c) HMI graphics importance in the process control industry. Prepare graphical user interface template.

****

E-CODE

Paper / Subject Code: 42772 / Process Automation

BE | Sem - VII | INST | C-2019 | Dec-2023

(3 Hours) **Total Marks: 80**

Note:

1. **Question No.1 is compulsory**
2. **Solve any THREE questions out of remaining FIVE questions.**
3. **Figure to the right indicate full marks.**

Q 1		Answer the following: [Any FOUR]	
	a)	Define Automation. Explain the types of Automation	(05)
	b)	List the four vendors of DCS with model name	(05)
	c)	Explain the Specification of any one PLC.	(05)
	d)	What is the difference between BPCS and SIS.	(05)
	e)	Explain the different relay type of Instruction used in PLC	(05)
Q 2	a)	Draw and explain the working of Discrete AC input module with diagram	(10)
	b)	Compare PLC, DCS and SCADA systems in detail.	(10)
Q 3	a)	Write a PLC Ladder Program for following condition: When you pressed START PB Motor M1 starts immediately and Motor M2 starts after 20s. When you pressed stop button both motors stop immediately. Draw the GUI, I/O listing and PLC Selection.	(10)
	b)	Explain the different types of DCS displays. State the significant of each display	(10)
Q 4	a)	What is scan intervals of SCADA system? Explain the factors affecting scan intervals with example	(10)
	b)	Explain Hierarchical levels in any automated plant.	(10)
Q 5	a)	Explain Alarm management system	(10)
	b)	What are independent Protection layers? Explain the significant of all layers with reference to SIS	(10)
Q 6		Write Short notes (Any Two)	
		a) RTU and MTU in SCADA	(10)
		b) DCS Architecture	(10)
		c) Timer and Counter Instructions in PLC	(10)

---

6 2 code

38494

VII /INST / C-2019 / SH-2023

Paper / Subject Code: 42774 / Machine Learning (DLOC - III)

[Time: Three Hours] **Marks 80**

N.B: 1 Question 1 is compulsory

2 Attempt any three questions from remaining five questions

3 Assume suitable data wherever necessary

Q. 1 Answer any four questions out of the five questions given below:

a Explain in brief, logistic regression. 5

b What are the different types of machine learning (ML) techniques? Explain each with an example. 5

c List the steps involved in designing a ML algorithm for any application. 5

d Explain in brief, the concept behind Hierarchical clustering. 5

e Explain the concept of Gradient Descent with suitable diagram. 5

Q. 2 a Using the method of least squares, derive the coefficients of best fit line for linear regression. 10

b What is the curse of dimensionality? Explain the Principal Component Analysis (PCA) technique and the steps involved in achieving data reduction, using PCA. 10

Q. 3 a Draw and explain the confusion matrix and its related terminologies. Also explain the concept of trade-off between precision and recall. 10

b Explain the working of decision tree algorithm with suitable example. 10

Q. 4 a Explain Gaussian mixture model and the corresponding Expectation-Maximization algorithm. 10

b Explain the steps involved in performing k-Means clustering, with a suitable numerical example. 10

Q. 5 a Give the comparison between the working of a real neuron and an artificial neuron. Explain the steps involved in implementation of back propagation algorithm in ANN. 10

b Explain the advantage of using Support Vector Machine (SVM) as a classifier. Also explain the Karush–Kuhn–Tucker (KKT) condition of SVM. 10

Q. 6 a Give the application of machine learning algorithm, for anomaly detection. 10

b What is meant by regularization in supervised learning? Explain the LASSO regularization technique. 10

****