University of Mumbai

Program: **Electronics Engineering**

Curriculum Scheme: Rev2016

Examination: BE Semester VII

Course Code: ELX701 and Course Name: Instrumentation System Design

Time: 2 hours 30 minutes Max. Marks: 80

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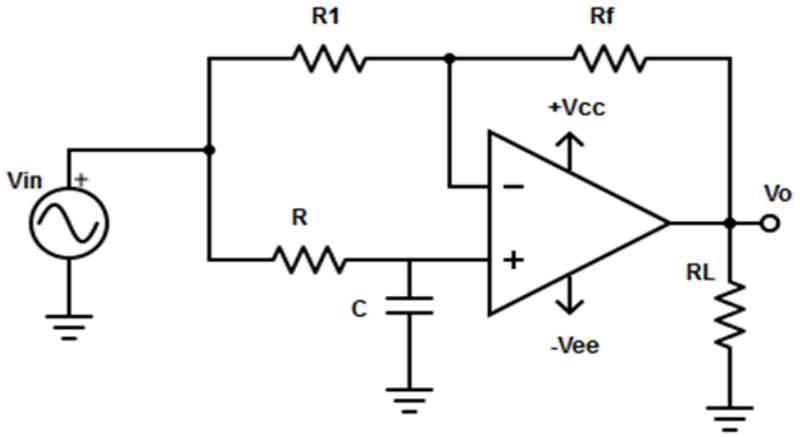
Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	What happens if the position of R and C are interchanged in the below circuit diagram? 
Option A:	Vin leads VO
Option B:	Vin lags VO
Option C:	VO leads Vin
Option D:	VO leads Vin
2.	Why is AC power not required in remote areas or locations for the operation purpose of a two-wire transmitter?
Option A:	transmission power is lowered up to 4-20mA current output signal
Option B:	transmission power is lowered up to 1-4 mA current output signal
Option C:	transmission power is lowered up to 1-10 mA current output signal
Option D:	two-wire transmitters do not operate in remote areas
3.	What is the relationship between the steady-state error, gain and the tendency of oscillations when the controller is supposed to be under the proportional action?
Option A:	Steady-state error increases with an increase in gain and oscillation tendency
Option B:	Steady-state error decreases with the decrease in gain and oscillation tendency
Option C:	Steady-state error decreases with an increase in gain and oscillation tendency
Option D:	Steady-state error increases with the decrease in gain and oscillation tendency
4.	Which of the following is/are the drawback/s of proportional control? 1. Proportional control system is complicated and costly. 2. Proportional control system is not suitable for pressure temperature and flow control problems 3. If there is a sudden disturbance, the proportional control system takes time to stabilize.
Option A:	(1)

Option B:	(2)
Option C:	(3)
Option D:	(1), (2) and (3)
5.	Which of the following can be used for long distance communication?
Option A:	I2C
Option B:	Parallel port
Option C:	SPI
Option D:	RS232
6.	To stop the program if the DAQ Assistant encounters an error, use the _____ function to extract the error status and wire this to the conditional terminal of the While Loop.
Option A:	Build Array
Option B:	Unbundle by name
Option C:	Bundle by name
Option D:	Disassemble cluster
7.	When will the Digital acquisition systems be used?
Option A:	bandwidth is high
Option B:	bandwidth is medium
Option C:	bandwidth is zero
Option D:	bandwidth is low
8.	Which of the following is the heart of a SCADA system?
Option A:	PLC
Option B:	HMI
Option C:	Alarm task
Option D:	I/O task
9.	Which of the following statements is correct?
Option A:	Ladder logic is a PLC graphical programming technique introduced in the last 10 years.
Option B:	A ladder logic program is hard to analyze because it is totally different when compared with the equivalent relay logic solution.
Option C:	The number of ladder logic virtual relays and input and output instructions is limited only by memory size.
Option D:	The number of contacts for a mechanical relay is limited to the number of coils on the relay.
10.	An OR function implemented in ladder logic uses:
Option A:	Normally-closed contacts in series
Option B:	Normally-open contacts in series
Option C:	Normally-open contacts in parallel
Option D:	Normally-closed contacts in parallel

Q2	**Solve any Four out of Six** **5 marks each**
A	Distinguish between installed and inherent flow characteristics.
B	Draw circuit diagram of a basic RC band-pass filter. Sketch its frequency response clearly showing the expressions for cut-off frequencies.
C	Describe any two discontinuous controller modes.
D	What are two PLC operation modes? Describe both modes in brief.
E	List any five SAMA symbols. Draw a clear symbol with a brief description.
F	Write a short note on SCADA.

Q3	**Solve any Two** **10 marks each**
A	Draw the basic pneumatic system and describe its components.
B	Explain process reaction curve and Ziegler Nichols methods in brief.
C	Draw and explain cascade control. Discuss about the advantages of cascade control.

Q4	**Solve any two** **10 Marks each**
A	What is Solenoid? Explain its working in brief.
B	Explain the working of active band pass filter.
C	Explain working of pinch valve with advantages and disadvantages. Discuss about selection criteria and field of applications.