University of Mumbai
Examination 2020 under cluster 4 (PCE)

Program: BE Mechanical Engineering
Curriculum Scheme: Rev2016
Examination: Third Year Semester VI
Course Code: MEDLO6021 and Course Name: Mechatronics

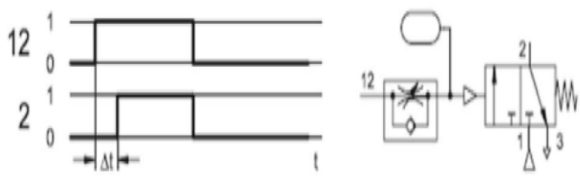Time: 1 hour   Max. Marks: 50

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Note to the students:- All the Questions are compulsory and carry equal marks .

Q1.	Which of the following is/are characteristic/s of mechatronic products and systems?
Option A:	No interaction between mechanical, electronic and information technologies
Option B:	Special interaction of subsystems in one physical unit
Option C:	Actuators with electrical auxiliary energy
Option D:	Actuators without electrical auxiliary energy
Q2.	Which control system does not have a stability problem?
Option A:	sequence system
Option B:	electrical system
Option C:	Open loop system
Option D:	Closed loop system
Q3.	In which system does the output not affect the process in any way?
Option A:	Open loop system
Option B:	Closed loop system
Option C:	sequence system
Option D:	pneumatic system
Q4.	Drives are also known as
Option A:	Sensors
Option B:	Actuators
Option C:	Controller
Option D:	Manipulator
Q5.	From the block diagram given in the following figure,the expression of C/R is:
Option A:	G1G2G3/1-G2G1
Option B:	G1G2/1-G1G2G3
Option C:	G1G2G3/1-G1G2G3
Option D:	G1G2/G3(1-G1G2)
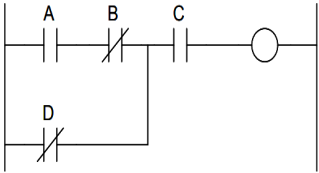
Q6.	Which material is used to make solenoid core?
Option A:	Copper
Option B:	Silver
Option C:	Iron
Option D:	Aluminum
Q7.	Drones uses
Option A:	Servo motor
Option B:	DC motor
Option C:	Stepper motor
Option D:	BLDC
Q8.	Induction motor required starter because:
Option A:	starting torque is high
Option B:	It's run against heavy load
Option C:	It can not run in reverse direction
Option D:	starting current is more than its rated current
Q9.	A reading is recorded as 23.90 Centigrade. The reading has
Option A:	three significant figures
Option B:	four significant figures
Option C:	two significant figures
Option D:	five significant figures
Q10.	**The mechatronics is an interdisciplinary field in which the disciplines those act together are _____**
Option A:	Mechanical systems and Electronic systems
Option B:	Mechanical systems and Information technology
Option C:	Electronic systems and Information technology
Option D:	Mechanical systems, Electronic systems and Information technology
Q11.	**On-off Control is also called as _____.**
Option A:	one position control
Option B:	two position control
Option C:	four position control
Option D:	half position control
Q12.	**The capability of convention relay systems for complex operations is _____ that of the PLCs .**
Option A:	poor than
Option B:	excellent than
Option C:	as good as
Option D:	unpredictable as
Q13.	**Heat in thermal system is analogous to _____ in electrical energy.**
Option A:	Current
Option B:	potential difference
Option C:	Resistance

Option D:	Charge
Q14.	What is the function of sequence valve used in hydraulic circuits?
Option A:	sequence valves are used to perform number of operations one after the other after the set pressure is reached
Option B:	sequence valves are used to perform number of operations continuously before the set pressure is reached
Option C:	sequence valves after reaching set pressure oil is flown to the tank
Option D:	no use
Q15.	Which of the following is applicable for bleed off circuits?
Option A:	bleed off circuits develop heat in the system
Option B:	bleed off circuits are used for resistive loads
Option C:	bleed off circuits are used for runaway loads
Option D:	no use
Q16.	Why the pilot operated check valve used in clamping operation?
Option A:	To reduce leakage in spool valve and to avoid decrease in pressure during clamping
Option B:	To increase pressure during clamping
Option C:	To filter the pumped oil
Option D:	Not used in clamping
Q17.	The valve symbol shown in the figure is
Option A:	ON delay (Normally close) valve
Option B:	OFF delay (Normally open) valve
Option C:	Pressure relief valve
Option D:	Sequence valve
Q18.	If a pole is located at origin, how does it get represented on the magnitude plot
Option A:	$-10 \log (\omega)$ dB
Option B:	$-20 \log (\omega)$ dB
Option C:	$-40 \log (\omega)$ dB
Option D:	$-60 \log (\omega)$ dB
Q19.	At which condition of 'ξ', resonant peak does not exist and its maximum value is considered to be unity along with zero resonant frequency
Option A:	$0 < \xi < 0.707$
Option B:	$\xi > 0.707$
Option C:	$\xi = 0$

Option D:	ξ = 1
Q20.	Angle of Asymptotes in Open loop Transfer function, as given below, by Root locus method are $$G(S)H(S) = \frac{K}{S(S+6)(S^2+4S+13)}$$
Option A:	$60^0, 180^0, 300^0$
Option B:	$40^0, 80^0, 120^0, 160^0$
Option C:	$45^0, 135^0, 225^0, 315^0$
Option D:	$80^0, 160^0, 240^0, 320^0$
Q21.	Proportional band of a controller is expressed as
Option A:	Percentage
Option B:	Range of control variable
Option C:	Ratio
Option D:	Gain
Q22.	The boolean representation of the given PLC program is
Option A:	ABC + D
Option B:	C + D(A+B)
Option C:	C(AB + D)
Option D:	ABC + BD
Q23.	Why latches are called memory devices?
Option A:	It has capability to store 8 bits of data
Option B:	It has internal memory of 4 bits
Option C:	It can store 1 bit of data
Option D:	It can store infinite amount of data
Q24.	In PLC, scan time refers to the amount of time in which
Option A:	timer and counters are indexed by
Option B:	one rung of ladder logic takes to get complete
Option C:	the entire program takes to execute
Option D:	the technician enters the program
Q25.	Latch is a device with
Option A:	One stable state

Option B:	Two stable states
Option C:	Three stable states
Option D:	Infinite stable states

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Question	Correct Option (Enter either 'A' or 'B' or 'C' or 'D')
Q1.	B
Q2.	C
Q3.	A
Q4	B
Q5	A
Q6	C
Q7	D
Q8.	D
Q9.	B
Q10.	D
Q11.	B
Q12.	A
Q13.	D
Q14.	A
Q15.	C
Q16.	A
Q17.	A
Q18.	B
Q19.	B
Q20.	C
Q21.	A
Q22.	C
Q23.	C
Q24.	C
Q25.	B