TE Mechanical Sem VI (R-2019) Automation & AI May 22

27/5/2022

University of Mumbai

Examinations Summer 2022

Time: 2hour 30 minutes

Max. Marks: 80

Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	Which intelligent agent works on partial observable environment?
Option A:	Model based agent
Option B:	Simple reflex agent
Option C:	Learning agent
Option D:	Goal based agent
2.	_____ is not the type of automation.
Option A:	Fixed Automation
Option B:	Programmable Automation
Option C:	Flexible Automation
Option D:	Independent Automation
3.	Which of the following statements are true for accumulators used in hydraulic systems? 1.accumulator stores fluid with pressure 2.accumulator stores fluid without any pressure 3.accumulator stores compressible liquid 4. spring is used as an external source to keep the fluid under hydraulic pressure
Option A:	1, 3 and 4
Option B:	2 and 3
Option C:	1 and 4
Option D:	2, 3 and 4
4.	_____ is not the part of Hydraulic System.
Option A:	Compressor
Option B:	Pump
Option C:	Motor
Option D:	Oil Sump
5.	The number of moveable joints in the base, the arm, and the end effectors of the robot determines _____.
Option A:	Flexibility
Option B:	payload capacity
Option C:	operational limits
Option D:	degrees of freedom
6.	The function of PLC is to _____.
Option A:	Control outputs based on logical decisions
Option B:	Control motor speed
Option C:	Control voltage change form high voltage to low voltage
Option D:	Amplify weak signals
7.	Initial & final position of piston rod is identified by _____
Option A:	Push button

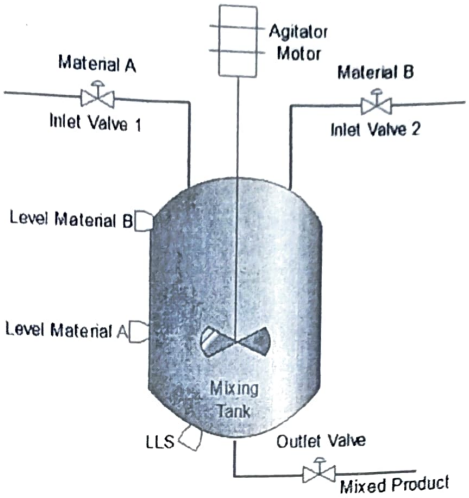
Option B:	DCV
Option C:	Hose pipes
Option D:	Limit Switch
8.	Which type of Machine learning use only labeled data for learning.
Option A:	Semi Supervised
Option B:	Unsupervised
Option C:	Reinforcement
Option D:	Supervised
9.	What is the DC range of solenoids in pneumatic systems?
Option A:	12 V and 24 V
Option B:	110 V and 220 V
Option C:	6V and 9V
Option D:	0 to 5 V
10.	Electric drive is preferred over Pneumatic and Hydraulic because of ____ .
Option A:	Less expensive
Option B:	Self-lubrication and cooling
Option C:	Positioning accuracy
Option D:	High strength

Subjective/Descriptive Questions

Q2	**Solve any Four out of Six5 marks each**
A	Explain Linear regression in detail with applications.
B	Draw and explain meter in and meter out circuit along with its significance in detail
C	Explain depth first search algorithm in short.
D	Write short note on FRL Unit
E	Draw and describe architecture of Goal Based agent.
F	Write short note on End effectors used in robots

Q3	**Solve any Two Questions out of Three 10 marks each**
A	Design electro pneumatic circuit for two cylinder operation withfollowing sequence using 5/2 both side solenoid operated valve asDCV. (AB)+ Delay A- B- (Where B- is 50% Slow) With user selection option single cycle & Multicycle operation.
B	Write detail note on Robot Configurations with respect to joints, applications advantages and disadvantages. (any three)
C	Explain Supervised, Unsupervised and Reinforcement Learning with applications and examples in detail.

Q4.	
A	**Solve any Two** **5 marks each**
i.	State & explain K Means Clustering algorithm in detail.
ii.	Explain various levels of Automation.
iii.	Discuss concept of Natural language processing.
B	**Solve any One** **10 marks each**
i.	Draw PLC Ladder logic for following operation

	Material A and Material B are collected in a tank. These materials are mixed for a 5min. Mixed product is then drained out through Outlet valve. Level sensors are used to detect levels. Motor is used for mixing operation. Solenoid vales are used to control inlet and outlet operations. 
ii.	Two double acting pneumatic cylinders A & B are selected for industrial application. Design PLC system to achieve the given output as per the following sequence specified (A+B+) (A-B-)