b.	Describe how the environment can be more protected with help of IoT Technology in the following areas. i. Noise Pollution ii. Air Pollution Monitoring	12	4	3	3
31. a.	Illustrate and explain M2M – IoT Standardized Architecture.	12	3	4	1
	(OR)				
b.	Illustrate the IoT application transport protocol SCADA and explain it briefly.	12	3	4	1
32. a.	Illustrate the Hadoop ecosystem & explain it briefly.	12	3	5	1
	(OR)				
b.	Explain in detail the Industrial Automation Control Protocols.	12	3	5	1

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B.Tech. DEGREE EXAMINATION, MAY 2023

Fourth and Sixth Semester

18ECE231J – IOT SYSTEM DESIGN

(For the candidates admitted from the academic year 2018-2019 to 2021-2022)

Note:

(i) **Part - A** should be answered in OMR sheet within first 40 minutes and OMR sheet should be handed over to hall invigilator at the end of 40th minute.

(ii) **Part - B & Part - C** should be answered in answer booklet.

Time: 3 hours Max. Marks: 100

		Marks	BL	CO	PO
	PART – A (20 × 1 = 20 Marks) Answer **ALL** Questions				
1.	Which type of Actuators tend to be compact, Lightweight, Economical, and with High Power Density? (A) Hydraulic Actuators (B) Magnetic Actuators (C) Pneumatic Actuators (D) Soft Actuators	1	1	1	1
2.	Which of the following devices is used to measure the Gases or Liquid? (A) Optical Sensor (B) Gas Sensor (C) Smoke Sensor (D) Pressure Sensor	1	2	1	1
3.	Which of the following Topology is used for Zig Bee smart energy? (A) Bus (B) Ring (C) Star (D) Mesh	1	2	1	1
4.	What is the frequency rate of Z-Wave? (A) 908.42 GHz (B) 928.49 GHz (C) 888.42 GHz (D) 708.49 GHz	1	1	1	1
5.	Which of the following layer applies carrier sense multiple access with collision avoidance in wireless networks? (A) Physical (B) Date Link (C) Network (D) Transport	1	2	2	1
6.	IEEE 802.11 direct sequence spread spectrum uses _____ modulation. (A) Binary Phase shift Keying (B) Phase Shift Keying (C) Quadrature Phase Shift Keying (D) Quadrature Amplitude Modulation	1	1	2	1
7.	Which of the following terminology bridges wireless LAN traffic into the wired LAN? (A) Access Point (B) System (C) Station (D) Topology	1	1	2	1

8.	Routing protocol lossy network that organizes routers along a _____	1	1	2	1
	(A) Destination oriented directed Acyclic graph (B) Destination organized directed Acyclic graph				
	(C) Dedicated oriented directed Cyclic Graph (D) Dedicated organized directed Acyclic Graph				
9.	Smart GRID network improves power saving in the order of _____	1	1	3	3
	(A) 5 – 10% (B) 5 – 15%				
	(C) 5 – 20% (D) 5 – 25%				
10.	What are sub systems of building automation systems reference model?	1	1	3	3
	(A) Sensor / Actuator, Control, Building Application (B) Sensor / Actuator, Building Application				
	(C) Sensor / Actuator, Area Control, Zone Control, Building Control, Building Application (D) Sensor / Actuator, Building Control				
11.	Pick the ODD statement with respect to comfort & Convenience of Home Automation.	1	2	3	3
	(A) Actuators to control motorized blinds, shutters, and curtains are often counted in this area (B) Attention for CO_2 reduction				
	(C) Conserving energy & Protecting buildings from Mold & Mildew (D) In Energy – Efficient houses, the buildup of Humidity				
12.	What is the role of cloud in smart Grid Architecture of IOT?	1	2	3	3
	(A) Store Data (B) Manage Data				
	(C) Collect Data (D) Security				
13.	Which of the following protocol is widely used in the control & Monitoring of remote terminal units of the Electrical distribution GRID?	1	2	4	1
	(A) MQTT (B) COAP				
	(C) TCP (D) SCADA				
14.	Which of the following Protocol is Light Weight?	1	2	4	1
	(A) IP (B) HTTP				
	(C) MQTT (D) COAP				
15.	How many levels are present in complex SCADA system?	1	1	4	1
	(A) 3 – Levels (B) 4 – Levels				
	(C) 5 – Levels (D) 6 – Levels				
16.	Which of the following data format follows a model that defines how the data is represented and organized?	1	2	4	1
	(A) Structured (B) Unstructured				
	(C) BIG (D) CLOUD				
17.	Which of the following is not type of learning?	1	2	5	4
	(A) Supervised (B) Unsupervised				
	(C) Semi – Unsupervised (D) Reinforcement				

18.	Among the following options choose the one which depicts the correct reason why big data analysis is difficult to optimize?	1	2	5	4
	(A) The technology to mine data (B) Both data & cost effective ways to mine data to make business sense out of it				
	(C) Lower Operational Efficiency (D) Poor Customer Service				
19.	Which of the following framework is described as a programming model to develop Hadoop based applications that can process massive amounts of data?	1	2	5	4
	(A) Mahout (B) Map reduce				
	(C) Heron (D) Oozie				
20.	Which of the following Job control in HADOOP?	1	1	5	4
	(A) Task Class (B) Mapper Class				
	(C) Job Class (D) Reducer Class				

PART – B (5 × 4 = 20 Marks)

Answer **ANY FIVE** Questions

		Marks	BL	CO	PO
21.	Explain any two types of sensors for IoT applications?	4	1	1	1
22.	Illustrate the functional blocks of routing for low power lossy networks.	4	2	2	3
23.	Compare: IPv6 with IPv4.	4	3	2	1
24.	Discuss the protocol stack for transporting SCADA over IP.	4	3	4	1
25.	Explain the function of IoT Gateway Router.	4	1	4	1
26.	Explain how IoT technology is used in the area of smart loads?	4	3	3	1
27.	Discuss the role of Machine learning for data analytics in IoT application.	4	3	5	1

PART – C (5 × 12 = 60 Marks)

Answer **ALL** Questions

		Marks	BL	CO	PO
28. a.	Explain the need for low power consumption and its management in IoT devices.	12	3	1	1
	(OR)				
b.	Describe the IoT access technologies with their specifications.	12	3	1	1
29. a.	Illustrate and explain the principle of operation of lightweight IP stack for IoT communication with neat diagram.	12	3	2	1
	(OR)				
b.	Discuss the IEEE 802.11 Wi-Fi communication Technology in detail.	12	4	3	3
30. a.	Explain in detail the implementation of IoT technology in the following areas.	12	4	3	3
	i. Smart Grids				
	ii. Renewable Energy Systems				
	(OR)				