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V Semester Diploma Examination, June/July-2023

**INDUSTRIAL INTERNET OF THINGS**

Time : 3 Hours ]

[ Max. Marks : 100

*Instruction :* Answer one full question from each section.**SECTION - I**

1. (a) Dell technologies realized significant cost savings from the use of a predictive maintenance application run in the DELL IT data Lake. The company avoided more than \$ 100 million in costs due to this change. Explain the technology of predictive maintenance used in detail. 10
- (b) In the digital transformation of the energy sector, smart grids and smart meters will be key drivers for a successful digitalization. Explain the necessity of adopting IOT technology in the energy sector. 10
  
2. (a) In health care sector, IOT has brought significant changes to improve the facilities and information system during COVID-19 Pandemic. Justify your answer, how IOT has helped in digitization of medical processes and proper management in the hospitals. 10
- (b) Manufacturing enterprises are seeking to leverage IT/OT convergence to achieve gains in productivity and reduction in cost, while managing the inherent risks of convergence. Discuss the challenges of IT/OT convergence in the Manufacturing Industry. 10



## SECTION - II

3. (a) Which is the most preferred protocol for Car Sensors ? It should support event driven message transfer and queuing through wireless networks. Explain its features and working principle. 10
- (b) Bluetooth offers device control through a smart phone. But, it only allows eight devices to be connected, Zigbee supports upto 65000 nodes, but there is a fee for every connected device. Compare and explain both the technologies. 10
4. (a) This protocol was not initially created for IOT applications, except for banking environments. In this protocol delivery is guaranteed as well as acknowledgement. Explain the features of this Advanced message queuing protocol. 10
- (b) Amazon side walk is a IOT network that uses LoRa radios to connect devices with Amazon's cloud when they are beyond the reach of traditional home networks. Elaborate the features and concept of the LoRa WAN technology used by Amazon side walk. 10

## SECTION - III

5. (a) The organizations today have to constantly evaluate their cloud infrastructure to ensure that the cloud delivers results, because there are different security and management demands for each of the three cloud models. Explore the features of all the three cloud models in detail. 10
- (b) An IT company decides to provide free access to a public cloud dedication to higher education. Explain all the three cloud computing services it can embrace. 10

6. (a) The best way to ensure card data security is by using a payment gateway while handling card payments. Explain how gateways are used for data management, local applications and device management in IOT. 10
- (b) In Samsung mobile phones, for setting up the apps stacked in its store, the company is using AWS services, using AWS app development services, Samsung wanted to provide its customer with the facility to download the apps anywhere without any network traffic. List the applications and features of services provided by AWS. 10

#### SECTION - IV

7. (a) IOT devices make up for 30% of all network-connected end points, making many companies the primary targets for cyber criminals : Is security support on IOT devices essential ? State a better way to secure the IOT devices. 10
- (b) A security auditing wants to check the security level of IOT based industries. What methodology is incorporated to check the degree of security level ? What are the advantages for the IOT industries by doing so ? 10
8. (a) IOT based data acquisition system is a collection of software and hardware that allows one to measure or control physical characteristics of something in the real world. Analyse how physical data is measured and controlled in real world using data acquisition system with a neat block diagram. 10
- (b) In the health care industry (Medical IOT) devices are already being utilized to remotely monitor patient's vital signs and has proven very helpful since the pandemic, what are the possible consequences of IOT security attacks in medical IOT ? 10

## SECTION - V

9. (a) In smart asset tracking, system sensors like RFID sensors, GPS, accelerometer sensors etc. monitors required system parameters. The data is recorded in the system and historical data can be viewed whenever required using cloud. In order to design this system, what are the components required and if the system behaves improperly, how do you test and troubleshoot to make the system functional? 10
- (b) Despite the pandemic induced reduction in air travel, the IATA forecast predicts 8.2 billion Air travellers in 2037. To handle this exponential growth in the number of the passengers in the coming years, Airlines will require the powerful capabilities of Airport Digitalization. Discuss the rise of IOT solutions and their impact on airport experiences. 10
10. (a) To establish the connectivity between building A computers in one LAN network with building B computers in another LAN through a router. Though after following all the proper procedure like assigning IP addresses to those computers, IP address to Router, proper cable connectivity etc, still the packet of information is not transferring between two LAN. Find the problem and troubleshoot it. 10
- (b) Novartis is one of the world's largest health care companies that provide solutions for patient's well-being. Data analysts of Novartis are taking advantage of the AWS services and still implementing new solutions for the patients. Recommend the data analysis and AWS technology adopted by Novartis to meet its desired requirements and improve the efficiency. 10
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