No. of Printed Pages : 4

Sl. No.

B2.5-R5 : IoT & CLOUD SERVICES

DURATION : 03 Hours **MAXIMUM MARKS : 100**

Roll No. : | | | | | | |

Answer Sheet No. : | | | | | | |

Name of Candidate : _____ **; Signature of Candidate :** _____

INSTRUCTIONS FOR CANDIDATES :

- Carefully read the instructions given on Question Paper, Answer Sheet.
- Question Paper is in English language. Candidate has to answer in English Language only.
- **Question paper contains Seven questions. The Question No. 1 is compulsory. Attempt any FOUR Questions from Question No. 2 to 7.**
- **Parts of the same question should be answered together and in the same sequence.**
- **Questions are** to be answered in the **ANSWER SHEET** only, supplied with the Question Paper.
- **Candidate cannot leave the examination hall/ room without signing on the attendance sheet and handing over his/her Answer Sheet to the Invigilator. Failing in doing so, will amount to disqualification of Candidate in this Module/Paper.**
- After receiving the instruction to open the booklet and before answering the questions, the candidate should ensure that the Question Booklet is complete in all respects.

DO NOT OPEN THE QUESTION BOOKLET UNTIL YOU ARE TOLD TO DO SO.

1. (a) Discuss how cloud architecture layers and models, specifically IaaS, SaaS, and PaaS, serve different needs in the tech industry.

(b) List down the different applications of cloud computing and IoT in the field of agriculture.

(c) Describe the function and significance of low power microcontrollers and ARM cortex M series in IoT devices.

(d) Analyze the role of IoT connectivity options like NBIoT, LoRaWAN, and WiFi in developing robust IoT networks.

(e) Outline the key considerations in choosing between IoT Open-Source Frameworks versus Commercial Frameworks, particularly in terms of security and scalability.

(f) Discuss how IoT and cloud technologies are transforming manufacturing, particularly through digital twins and predictive maintenance.

(g) Evaluate the interplay between cloud computing, big data, and IoT in enhancing operational efficiency and decision-making in industrial IoT.

(7x4)

2. (a) Describe various cloud computing platforms and discuss how they differ in terms of features and functionalities.

(b) Analyze the main security and privacy challenges faced by cloud computing environments and suggest potential mitigation strategies.

(9+9)

3. (a) Discuss the role of virtualization technology in enabling cloud services, including the significance of containerization.

(b) Compare the service models of cloud computing: IaaS, PaaS, and SaaS, providing examples for each.

(9+9)

4. (a) Discuss the criteria for selecting IoT gateways and the importance of gateway devices in IoT networks.

(b) Explain the process of integrating and managing various microcontroller peripherals (like timer, GPIO, ADC, PWM, DAC) in IoT applications.

(9+9)

5. (a) Give details of the advantages and limitations of different IoT connectivity options such as NBIoT, LoRaWAN, and WiFi specific to IoT deployments.

(b) Describe various network topologies used in IoT and their implications on network design and scalability.

(9+9)

6. (a) Discuss different components of an IoT architecture and explain how they interact within an IoT ecosystem.

(b) Discuss the significance of IoT analytics life cycle and the role of data analysis in deriving actionable insights from IoT data.

(9+9)

7. (a) Explore the role of IoT and cloud computing in enabling smart agriculture, specifically focusing on advanced technologies for soil texture mapping and health assessment.

(b) Elucidate the integration of IoT with cloud computing in the healthcare sector, emphasizing models for IoT healthcare systems and the importance of data security.

(c) Analyze how the convergence of IoT, cloud and big data technologies are driving innovations in Industry 4.0, especially in remote monitoring and digital twins.

(6+6+6)

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SPACE FOR ROUGH WORK