National Institute of Technology Tiruchirapalli

CSPE83-Internet of Things- Principles and Practices
January 2023
Department of CSE
Cycle Test-1

Date: 09-03-2023   Marks:15

Answer all the questions.

1. (a) Define the characteristics of smart objects?   1 Mark

    → Process unit
    Sensors / Ac
    comm dev
    Power

    (b) Explain 6LoWPAN header stack with diagram?   Power   1 Mark

    (c) Define LoRaWAN architecture?   1 Mark

    Peer to peer & server Arane
    ↳ delay, Flex
    5

    (d) Differentiate 802.15.4g and 802.15.4e?   802.11ah wiff   1 Mark

    smart grid/utility   wireless improve.   1902. power   Expansion   1 Mark

    (e) How RPL decides rank of a node, explain with example?   of mac layer

    supeel, Remote Tery, Com HAN

2. (a) Explain tunnelling mechanism of SCADA protocol with suitable examples?   5 Marks

    IP convert over various generation

    (b) Write the following details regarding a Raspberry Pi 4   5 Marks
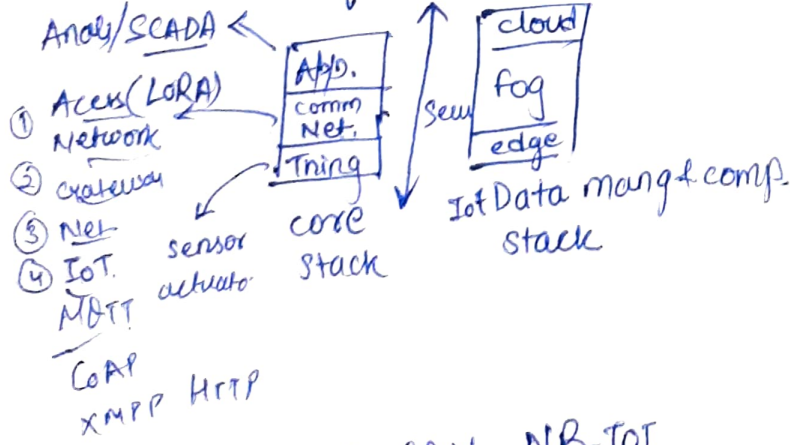   (i) Design a simple IoT application for sending an email on switch press?
       (iv) Design a simple IoT application to control intensity of a LED in RPi 4 with suitable connection diagram and python code?

COAP → UDP
MQTT → TCP

→ oneM2M → 3 layer (ASN)
→ IOTWF → 7 layer

→ simplified Arch,

Analy/SCADA ←
① Acces(LORA)
   Network
② gateway
③ Net
④ IoT.
   MQTT
   CoAP
   XMPP HTTP

App.
Comm
Net.
Thing

cloud
fog
edge

Seu

sensor   core
actuato stack

Iot Data mangt comp.
stack

ZibBee → automation   low pow/ba
802.15.4
6LoWPAN
   ↳ IPv6
wireless HART → time syn

LoRAWAN — NB-IoT

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Date: 12-04-2023   **Cycle Test-2**   **Marks:15**

Answer all the questions.

1. **(a)** Give examples of structured and unstructured data in IoT?   [CO4]   **1 Mark**

    (b) With a suitable real-life example, explain types of data analysis? [CO4]   **1 Mark**

    (c) Differentiate MPP and NoSQL database with examples?   [CO2]   **1 Mark**

    (d) Give an example to explain time function in APU?   [CO4]   **1 Mark**

    (e) How FNF flow monitor works and how to implement FNF in multiservice IoT networks? [CO4]
    1 Mark

2. **(a)** Explain the working procedure of Hadoop with examples?   [CO1, CO4]   **5 Marks**

    (b) Why NETCONF-YANG is used and how is it different from AWS and Dijango frameworks?
    [CO2, CO4]
    5 Marks