

CAT 1

ACADEMIC YEAR: 2020-2021

DEPARTMENT: ETT

LEVEL: 3

SEMESTER: 1

MODULE TITLE: INTERNET OF THINGS AND EMBEDDED SYSTEM
APPLICATIONS

MODULE CODE : ETT303

CREDIT UNITS : 15

DATE : 21/04/2021

DURATION : 1h

MAXIMUM MARKS: 4

INSTRUCTIONS:

1. This examination paper comprises **TWO** sections
2. Section **ONE** is **COMPULSORY**
3. Attempt any **TWO** questions of section TWO
4. Cell phone is not allowed in an examination room
5. Make sure you fill the answer booklet cover page with required information with a legible handwriting
6. Write all answers in the answer booklet provided and don't remove any sheet from it

SECTION ONE: Attempt all questions

20Marks

- 1) Define the following terms **/2marks**
 - a) MQTT
 - b) CoAP
- 2) After being introduced about what is Internet of Things from different personal perspectives, describe in your own words how do you understand IoT. **/2marks**
- 3) What the key primary role of IoT gateway? Above the primary role of an IoT Gateway, provide at least 3 additional tasks that can be performed by an IoT Gateway. **/3marks**

- 4) Provide at least two differences between M2M communication and an Internet of Things technology? **/2marks**
- 5) What is the difference between edge and fog computing? **/2marks**
- 6) Could we have an IoT system without a gateway? Justify your answer? **/2marks**
- 7) Give 2 primary functions of an IoT cloud platform? **/2marks**
- 8) What is the difference between IoT cloud computing and edge computing? **/2marks**
- 9) Give two disadvantages of a cloud computing over edge computing. **/2marks**
- 10) What is the role of protocols in IoT ecosystem? **/1mark**

SECTION TWO: Attempt only two questions of your choice /20marks

- 1) Tumba farming Ltd is an agriculture company specialized in cultivating tomatoes. Recently, the company has faced the problem of low production volume due to the unsuitable soil conditions resulted from the climate change. Currently, the company is looking for a digital solution for improving their business and solve the stated problem. Suppose you are hired as an IoT expert to design and implement the required solution. Please briefly describe what do you think might be the cause of low production volume and propose an affordable digital solution that allows the company manager to monitor the business growth at any time and at any place. The weight will be given to the relevance of the problem identified, proposed solution, system architecture block diagram and the system functionality and the components to be used. **/10 marks.**
- 2) Referring to the Internet protocol suite or TCP/IP protocol suite
 - a) Identify and provide function of each of 4 layers of IoT communication protocol suite. **/8marks**
 - b) For each layer identified in above sub-question (a), provide at least one protocol that should be used at that layer.? **/2marks**
- 3) By help of a schematic diagram explain the functional components of three and five layers of IoT architecture. **/10marks**