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Printed Page:-4 **Subject Code:- ACSIOT0601**

Roll. No:

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA
(An Autonomous Institute Affiliated to AKTU, Lucknow)
B.Tech
SEM: VI - THEORY EXAMINATION (2025 - 2026)
Subject: IoT Protocols & Its Applications

Time: 3 Hours **Max. Marks: 100**

General Instructions:

IMP: *Verify that you have received the question paper with the correct course, code, branch etc.*

1. *This Question paper comprises of* ***three Sections -A, B, & C.*** *It consists of Multiple Choice Questions (MCQ's) & Subjective type questions.*

2. *Maximum marks for each question are indicated on right -hand side of each question.*

3. *Illustrate your answers with neat sketches wherever necessary.*

4. *Assume suitable data if necessary.*

5. *Preferably, write the answers in sequential order.*

6. *No sheet should be left blank. Any written material after a blank sheet will not be evaluated/checked.*

SECTION-A 20

1. Attempt all parts:-

(1.1) The following OS is not commonly used in Raspberry Pi (CO1, K1) 1

(a) Raspbian
(b) Ubuntu
(c) Windows 10 IoT Core
(d) Fedora

(1.2) IoT protocols are optimized for (CO1, K1) 1

(a) High latency
(b) Low power and low bandwidth
(c) High bandwidth
(d) Centralized networks

(1.3) Standard ports of MQTT protocol are _____ (CO2, K1) 1

(a) I2C
(b) SSL
(c) USART
(d) TCP/IP

(1.4) CoAP provides which of the following requirements? (CO2, K1) 1

(a) Multicast support and simplicity
(b) Low overhead and multicast support
(c) Simplicity and low overhead
(d) Multicast support, Low over head, and simplicity

(1.5) The EIGRP metric values include (CO3, K1) 1

(a) Delay
(b) Bandwidth
(c) MTU
(d) All of the mentioned

(1.6) EIGRP uses the _____ algorithm for finding shortest path. (CO3, K1) 1

(a) SPF
(b) DUAL
(c) Linkstat
(d) Djikstra's

(1.7) The required signal strength from tag to reader is high in _____ RFID. (CO4, K1) 1

(a) Active
(b) Passive
(c) Both active and passive
(d) None of these

(1.8) The following is not a characteristic of a Zigbee network. (CO4, K1) 1

(a) Low power consumption
(b) Easy installation
(c) High data rates
(d) Unlicensed radio bands

(1.9) The programming languages used in Blynk are (CO5, K1) 1

(a) Python
(b) C/C++
(c) Java
(d) All of the mentioned

(1.10) The messaging nodes of CoAP are (CO5, K1) 1

(a) Confirmable and Non confirmable
(b) Acknowledgement
(c) Reset
(d) All of the mentioned

2. Attempt all parts:-

(2.1) Write any two Protocol of Network Layer. (CO1, K1) 2

(2.2) Define Direct exchange in AMQP. (CO2, K1) 2

(2.3) Write the two modes of IPsec operation. (CO3, K1) 2

(2.4) Name the various layers used in Z-wave. (CO4, K1) 2

(2.5) Write the default IP address of Thingspeak API. (CO5, K1) 2

SECTION-B 30

Answer any one of the following:-

(3.1) Compare three layered and five layered IoT architectures with suitable diagrams. (CO1, K1) 6

(3.2) Describe the learning board of Raspberry Pi 3 with key components. (CO1, K1) 6

Answer any one of the following:-

(3.3) Elaborate Dynamic discovery and global data space in DDS. (CO2, K2) 6

(3.4) Describe Secure MQTT and its advantage over MQTT. (CO2, K1) 6

Answer any one of the following:-

(3.5) Discuss the various types of ICMP messages. (CO3, K2) 6

(3.6) Discuss the differences between IPV4 and IPV6. (CO3, K2) 6

Answer any one of the following:-

(3.7) Discuss the various features of Z-wave. (CO4, K2) 6

(3.8) Explain why fragmentation is required in 6LoWPAN? (CO4, K2) 6

Answer any one of the following:-

(3.9) Explain how do we connect Blynk to cloud? (CO5, K2) 6

(3.10) Discuss the functionality of Thingspeak. (CO5, K2) 6

SECTION-C 50

4. Answer any one of the following:-

(4.1) A student team is building a smart weather station using Raspberry Pi. They want to log temperature and humidity data and send it to a remote server. Which features of Raspberry Pi make it suitable for this project, and what kind of protocol stack should they implement? (CO1, K2) 10

(4.2) An enterprise is integrating different sensors (temperature, humidity, motion) into a factory for automation. How would the IoT layered architecture help in organizing this system effectively? Compare its mapping with the OSI model for better understanding. (CO1, K2) 10

5. Answer any one of the following:-

(5.1) Describe the various feature of AMQP protocol and Explain its Architecture. (CO2, K2) 10

(5.2) A university is building a smart classroom setup where sensors detect room occupancy and environmental conditions and update a cloud dashboard. Evaluate which application layer protocol (CoAP, HTTP, or MQTT) is most appropriate for such an environment and justify your choice. (CO2, K2) 10

6. Answer any one of the following:-

(6.1) With the help of neat sketches explain the packet sturcture of IPV4 with all details. (CO3, K2) 10

(6.2) Discuss the importance of sequence number and acknowledge number in TCP session. (CO3, K2) 10

7. Answer any one of the following:-

(7.1) Describe the working principle, advantages, disadvantages and applications of a NFC. (CO4, K2) 10

(7.2) Explore use cases where LoRaWAN networks are deployed for smart city applications, environmental monitoring, and precision agriculture. (CO4, K2) 10

8. Answer any one of the following:-

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(8.1)	Describe the major components of Blynk platform. (CO5, K2)	10
(8.2)	Describe the various privacy and security issues in CoAP. (CO5, K2)	10