

**INTRODUCTION TO INTERNET OF THINGS
(INFO 4131)**

Time Allotted : 2½ hrs

Full Marks : 60

Figures out of the right margin indicate full marks.

*Candidates are required to answer Group A and
any 4 (four) from Group B to E, taking one from each group.*

Candidates are required to give answer in their own words as far as practicable.

**Group - A
(Multiple Choice Type Questions)**

1. Answer any twelve:

12 × 1 = 12

Choose the correct alternative for the following

- (i) Who coined the term “Internet of Things”?
(a) Kevin Aston (b) John Wright
(c) Edward Jameson (d) George Garton.
- (ii) Which of the following is not an IoT platform?
(a) Amazon Web Services (b) Microsoft Azure
(c) Salesforce (d) Flipkart.
- (iii) IoT gateway must provide _____
(a) Protocol abstraction (b) Data storage
(c) Security with hardware (d) Simple and fast installation.
- (iv) Which of the following is not an actuator in IoT?
(a) Stepper motor (b) A fan
(c) An LED (d) Arduino.
- (v) Which of the following protocol is used to link all the devices in the IoT?
(a) HTTP (b) UDP (c) Network (d) TCP/IP
- (vi) What is the full form of IDE in Arduino IDE IoT software?
(a) Intra Defence Environment
(b) Intra Development Environment
(c) Integrated Development Environment
(d) Integrated Deployed Environment.
- (vii) The oneM2M architecture divides IoT functions into
(a) Application layer (b) Service layer
(c) Network layer (d) All of (a), (b) & (c).

- (b) What is the role of common service layer in oneM2M based IoT solution? [[CO3](Remember/LOCQ)]
6 + 6 = 12
5. (a) Describe various IoT communication models with diagram. [[CO4](Analyse/IOCQ)]
 (b) Discuss the features of oneM2M device management framework in common service layer. [[CO3](Remember/LOCQ)]
6 + 6 = 12

Group - D

6. (a) Describe the sets and dictionaries with example in the context of python. [[CO5](Remember/LOCQ)]
 (b) Describe the diagram of the Raspberry Pi board in detail. [[CO7](Apply/HOCQ)]
6 + 6 = 12
7. (a) Discuss in detail the cloud computing in the context of Internet of Things (IoT). [[CO6](Remember/LOCQ)]
 (b) Discuss in details the data aggregation process for the Internet of Things (IoT) in Smart Cities. [[CO6](Understand/LOCQ)]
6 + 6 = 12

Group - E

8. (a) Why event-driven IoT systems are more effective in smart city environments? Give an example scenario in smart city environment where event-driven data transfer is suitable. [[CO7](Understand/LOCQ)]
 (b) List four services in smart mine that may use IoT solutions. [[CO7] (Remember/LOCQ)]
(2 + 2) + 8 = 12
9. (a) Why LoRAWAN is considered as a suitable network technology compared to WI-FI for smart city? [[CO7](Understand/LOCQ)]
 (b) Discuss the network infrastructure requirements for Smart City. How do Smart Cities aim to be sustainable? [[CO7] (Remember/LOCQ)]
4 + (6 + 2) = 12

Cognition Level	LOCQ	IOCQ	HOCQ
Percentage distribution	62.5	31.25	6.25

Course Outcome (CO):

After the completion of the course students will be able to

- INFO4131.1. Understand general concepts of Internet of Things (IoT) (Understand)
- INFO4131.2. Recognize various devices, sensors and applications (Knowledge)
- INFO4131.3. Apply design concept to IoT solutions (Apply)
- INFO4131.4. Analyze various M2M and IoT architectures (Analyze)
- INFO4131.5. Design and program IoT devices (Design)
- INFO4131.6. Evaluate design issues in IoT applications (Evaluate)
- INFO4131.7. Create IoT solutions using sensors, actuators and Devices (Create).

*LOCQ: Lower Order Cognitive Question; IOCQ: Intermediate Order Cognitive Question; HOCQ: Higher Order Cognitive Question.

