

(2½ Hours)

[Total Marks: 75]

- N. B.: (1) **All** questions are **compulsory**.
 (2) Make **suitable assumptions** wherever necessary and **state the assumptions** made.
 (3) Answers to the **same question** must be **written together**.
 (4) Numbers to the **right** indicate **marks**.
 (5) Draw **neat labeled diagrams** wherever **necessary**.
 (6) Use of **Non-programmable** calculators is **allowed**.

1. Attempt any three of the following:**15**

- Define and explain the Internet of Things with 2 examples.
- Explain calm and ambient technology using example of Live wire.
- What is manufactured normalcy field? Explain.
- Discuss the issue of Privacy in Internet of Things.
- What is TCP and UDP ports? Explain with examples.
- Define protocol. Explain the following application layer protocols: HTTP, HTTPS, SMTP, FTP, POP3, IMAP.

2. Attempt any three of the following:**15**

- Explain microcontrollers and system-on-chips with respect to embedded computing.
- Describe the difficulties encountered during the transition from a prototype to mass production?
- How can one tap into the community for promoting IOT devices? Explain.
- Describe Beagle bone Black with a focus on the following aspects: Operating System, Programming Language, Debugging, Hardware and Openness.
- Compare python characteristics with C++.
- Write a short note on Electric Imp.

3. Attempt any three of the following:**15**

- Explain the sketch, iterate and explore process in prototyping.
- What are laser cutters? Explain the main features to consider while choosing a laser cutter.
- What is CNC Milling? Explain.
- Explain the following terms with respect to APIs: (a) Scraping, (b) Mashing up APIs.
- What is comet? Explain.
- Explain the following protocols suited to Internet of Things applications: Message Queuing telemetry transport (MQTT), Extensible Messaging & Presence Protocol (XMPP), Constrained Application Protocol

4. Attempt any three of the following:**15**

- What are the concerns regarding performance and battery life while writing code for embedded systems?
- Write a short note on long tail of Internet.
- Explain different types of libraries for embedded systems which works with limited memory.
- Discuss the business model canvas for Internet of Things.

[Contd...]

- e Explain the following business models:
 - i. Provide infrastructure
 - ii. Take a percentage
 - iii. Be a Key Resource
- f What is venture capital? How can one exit?

5. Attempt any three of the following:

15

- a. Explain the steps for manufacturing PCBs.
 - b. Discuss different environmental issues in Internet of Things.
 - c. Write a short note on mass-producing the case and other fixtures.
 - d. Explain in detail the process of designing kits.
 - e. Discuss the issues in scaling up the software for large scale IOT devices.
 - f. Explain the five critical requirements for sensor commons project.
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