

(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.
- List and explain the roles of people making IoT.
- Discuss the issue of Privacy in Internet of Things.
- What are TCP n 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++.
- “Open source has a competitive advantage”. Discuss.

**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.
- What are non-digital methods and materials commonly used in prototyping?

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

**15**

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