(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**

a. Define and explain Internet of Things and Ubiquitous Computing.
b. "Any sufficiently advance technology in indistinguishable from magic." Discuss.
c. What is calm and ambient technology? Explain with example.
d. "Be conservative in what you do, be liberal in what you accept from others". Explain.
e. Define protocol. Explain the following application layer protocols:
i) HTTPS ii) SMTP iii) FTP iv) POP3 v) IMAP
f. Discuss the following IOT device use at Dos Liverpool.
i) Central Heating System. ii) Doorbot

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

a. How can we decide between the cost and ease of prototyping?
b. Discuss the merits and demerits of mixing open source and close source.
c. Explain the transition from prototype to production.
d. With the help of an example explain the process of Scaling up the electronics.
e. Explain the following with respect to prototyping embedded devices: Processor Speed, RAM, Networking, Power Consumption and physical size and form factor.
f. Compare Raspberry Pi and Arduino.

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

a. Explain the sketch, iterate and explore process in prototyping.
b. What are the features that need to be considered while choosing a laser cutter?
c. Explain the use of repurposing /recycling in prototyping IoT devices.
d. What is an API? What do you mean by mashing up API?
e. What are the legalities associated with scrapping?
f. Explain HTML5 web socket

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

a. Define business model. Explain different factors in the definition.
b. With the help of the diagram explain business model canvas.
c. Explain government funding for IoT projects.
d. How can we make optimum use of RAM while writing code for embedded devices?
e. With the help of examples compare stack and heap .
f. Explain in detail the process of debugging the code for embedded devices.

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

a. How are printed circuit board are designed? Explain.
b. Write a short note on mass-producing the case and other fixtures.
c. What is the important of certification? Why it is required?
d. Explain privacy with respect to IOT devices in detail.
e. Discuss the environmental issues associated with IOT devices.
f. What is cautious optimism? Explain.