Program/Sem:	T.Y.B.Sc IT – Sem - V	**Course:**	**Internet of Things: Theory and Practice**
Program Code:	IS00255	**Course Code:**	USIT502

Duration: 2 ½ Hour 0 4 NOV 2025 **Max. Marks:** 75

Instructions:

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**.

Q. 1 Attempt ANY THREE from the following: [15]

a) List and explain the role of people making IoT.

b) What is Calm and Ambient technology? Explain with example.

c) "Any sufficiently advanced technology is indistinguishable from magic." Discuss.

d) What is meant by "Magic as Metaphor" in IoT design?

e) Describe the principle "Small Pieces, Loosely Joined" and its relevance to IoT systems.

f) Define protocol. Explain the following application layer protocols:
a) HTTP b) HTTPS

Q. 2 Attempt ANY THREE from the following: [15]

a) Explain the sketch, iterate and explore process in prototyping.

b) Discuss the tradeoffs between cost verses easy of prototyping.

c) "Open source has a competitive advantage". Discuss.

d) Discuss the concept of System-on-Chip (SoC) and its importance in IoT prototyping.

e) What are the challenges when we move from prototyping to mass production. Explain.

f) Discuss how open hardware and software influences IoT prototyping and innovation.

Q. 3 Attempt ANY THREE from the following: [15]

a) Write a short note on laser cutters.

b) Illustrate the various non-digital methods of prototyping.

c) Explain the use of Repurposing/Recycling in prototyping IoT devices.

d) Write a brief note on MQTT protocol.

e) Differentiate 3D printing from CNC milling.

f) What is polling? Explain in brief.

Q. 4 Attempt ANY THREE from the following: [15]

a) Explain different types of memories used in IoT.

b) Give a comparison of Stack and Heap.

c) What are libraries? Explain the different types used in embedded systems.

d) Explain the term venture capital.

e) Discuss the business model canvas for Internet of Things.

f) Explain how to achieve customization in Internet of Things devices.

Q. 5 Attempt ANY THREE from the following: [15]

a) How are the printed circuit boards designed? Explain.

b) Discuss the issues in scaling up the software for large scale of IoT devices.

c) Write a short note on mass producing the case and other fixtures.

d) Explain Privacy with respect to Internet of Things.

e) What is cautious optimum? Explain.

f) Discuss the main goal of Open Internet of Things Definitions.

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