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**Presidency University**

**Bengaluru**

**SCHOOL OF ENGINEERING**

**MAKEUP EXAMINATION JULY 2024**

**Date**: 01 July 2024

**Time**: 09.30 am to 12.30 pm

**Max Marks**: 100

**Weightage**: 50 %

**Semester**: Makeup exam 2023 - 24

**Course Code**: CHE 1004

**Course Name**: SMART MATERIALS FOR IOT

**Program & Sem**: B.TECH

**Instructions:**

1. *Read the all questions carefully and answer accordingly.*
2. *Complete the test within the time give.*
3. *Scientific and Non-programmable calculators are permitted.*

**Part A [Memory Recall Questions]**

**Answer ANY TEN Questions. Each question carries TWO marks. (10Qx 2M= 20M)**

1. Identify the conducting polymer from the following examples.

a) Polypyrrole and b) Polyethylene (2 Marks, CO1, Knowledge)

1. Write any 2 examples for organic polymers. (2 Marks, CO1, Knowledge)
2. Who proposed the concept of “IoT”? (2 Marks, CO1, Knowledge)

1. Define biodegradable polymers. (2 Marks, CO1, Knowledge)
2. Define V2V and IoT. (2 Marks, CO1, Knowledge)
3. Write two examples for Smart materials. (2 Marks, CO1, Knowledge)
4. What are the different types materials utilized in IoT system?

(2 Marks, CO1, Knowledge)

1. What is inorganic polymer? (2 Marks, CO1, Knowledge)
2. Write the monomer used in synthesis of PVC (polyvinyl chloride)? (2 Marks, CO1, Knowledge)

1. Write any two types of sensor. (2 Marks, CO1, Knowledge)
2. What is PET? (2 Marks, CO1, Knowledge)
3. What is the importance of analyzing mechanical property of the materials? (2 Marks, CO1, Knowledge)

**Part B [Thought Provoking Questions]**

**Answer ANY FIVE Questions. Each question carries TEN marks. (5Qx10M=50M)**

1. Write down the,

(i) Synthesis of Polytetrafluoroethylene (PTFE) (or) Polystyrene

(ii) Synthesis of Platinum (or) Gold nanoparticles .

1. marks, CO2, Comprehension)

HCl

Aniline (A)

B

Ammonium persulfate, stirring

C (green precipitate)

Identify and draw the structure of ‘A’, ‘B’, ‘C’. Write the application of ‘C’ in sensor devices?

(10 Marks, CO2, Comprehension)

1. Why Copper is preferred more than Silver for IoT applications. Explain in detail.

(10 Marks, CO2, Comprehension)

1. Write a detailed note on national and international commercial importance on development of Smart materials for IoT devices. (10 Marks, CO2, Comprehension)
2. What is thermal analysis? Write the types of thermal analysis and their applications?

(10 Marks, CO2, Comprehension)

1. What is conducting polymers? What are the criteria for conducting polymers? Explain with suitable examples. (10 Marks, CO2, Comprehension)
2. Write a detailed note on role of Metal, metal oxide and hybrid materials for IoT applications.

(10 Marks, CO2, Comprehension)

**Part C [Problem Solving Questions]**

**Answer ANY TWO Questions. Each question carries FIFTEEN marks. (2Qx15M=30M)**

1. What are the different advantages of the polymers in engineering design? Explain in detail with suitable examples. (15 Marks, CO3, Application)
2. What are the different steps involved in fabricating floor mat for smart home using polyvinyl chloride (PVC) as a substrate material? Explain in detail.

(15 Marks, CO4, Application)

1. Write synthesis, properties and application as IoT materials for the following polymeric materials. a) Polyethylene, b) Polyimide and c) Polyvinylidene fluoride

(15 Marks, CO4, Application)