

**CENTRAL INSTITUTE OF PETROCHEMICALS ENGINEERING & TECHNOLOGY**  
**HEAD OFFICE: GUINDY, CHENNAI – 600 032.**  
**ACADEMIC CELL**  
**FIFTH SEMESTER EXAMINATION – JANUARY - 2024**

Duration : 3 Hours  
Course : DPT  
Subject : Plastics Recycling & Waste Management

Max. Marks: 60  
Date : 09.01.2024  
Time : 02.00 p.m. to 05.00 p.m.

**(DO NOT CHANGE SEQUENCE OF QUESTION NUMBER IN ANSWER SCRIPT)**

**PART – A**

Answer **all** questions

12 x 1 = 12

1. Tertiary recycling techniques is widely practiced for?  
(a) PMMA (b) PE (c) PVC (d) None of these
2. \_\_\_\_\_ cutters is used for low toughness(Polymer foam) material
3. Dark Plastics can be separated by NIR .Say True/False
4. Which property is used to separate different plastics in sink and float technology?  
(a) Size (b) Volume (c) Density (d) Shape
5. Sorting techniques is based on the Chemical, optical, electrical or physical property of Plastics waste. Say True/False
6. Forth flotation techniques are most effective method to separate which of the given plastics?  
(a) PVC (b) HDPE (c) Nylon (d) All of these
7. Abbreviates the SUP
8. Selective Dissolution segregation is useful for durable goods such as carpets, consumer electronics and automobile components. Say True/False
9. Which of the following materials sinks in water  
(a) PP (b) LDPE (c) HDPE (d) PS
10. The waste generated is estimated \_\_\_\_\_ % of the plastics consumption in Agriculture.
11. Write the full form of PCW
12. Primary recycling is also known as \_\_\_\_\_

**PART – B**

Answer **all** questions (Max. 40 words)

4 x 2 = 8

1. What is Solid waste and give its example?
2. How reflectance spectroscopy is works in Plastics waste sorting?
3. What is source of plastics waste in polymer manufacture?
4. Which process is most suitable for size reduction of film waste and why?

**PART – C**

Answer any **six** questions (Max. 100 words)

6 x 4 = 24

1. What is melt filtration separation?
2. What is the role of pyrolysis in plastics recycling?
3. What are the additives for improving the quality of recycled products?
4. Write short notes on guidelines for recycling of Plastics Waste.
5. Write flow chart for PP/HDPE woven sacks to Pot?
6. What is Monomer to Monomer approach in plastics waste recycling?
7. What is the role of Shredder, Agglomerator, Force Feeder and Extruder in Mechanical recycling plant?

**PART – D**

Answer any **two** questions (Max. 300 words)

2 x 8 = 16

1. What is recycling and its types? How recycling codes is helpful in plastics waste sorting process.
2. Write the process flow chart for Chemical recycling plant? Explain with examples
3. Write short notes on Segregation of plastics waste by simple identification techniques and density techniques. Explain

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**FIFTH SEMESTER EXAMINATION – JANUARY - 2024**

Duration : 3 Hours

Max. Marks: 60

Course : DPT

Date : 10.01.2024

Subject : Maintenance of Plastics Processing & Testing Equipments

Time : 02.00 p.m. to 05.00 p.m.

**(DO NOT CHANGE SEQUENCE OF QUESTION NUMBER IN ANSWER SCRIPT)**

**PART – A**

Answer **all** questions

12 x 1 = 12

- Output of thermocouples is in \_\_\_\_\_?  
a) Micro ampere      b) Micro volts      c) Millivolts      d) Milliohms
- Limit switch is \_\_\_\_\_ operated device.  
a) Mechanical      b) Electro,      c) Electronic      d) None of these
- What is NO and NC?
- Expand the term FRL used in a pneumatic system.
- What do you mean by term PLC?
- Medium voltage circuit breakers operate in the range of \_\_\_\_\_volts  
a) 300 to 750V      b) 600 to 15000V      c) 800 to 10000V      d) None
- A hydraulic Actuator is a device used to convert Hydraulic energy into Mechanical energy-say True or False
- Open loop control is a type of control system in which the output of the system is not monitored or fed back to the input. – True or False
- Pneumatic Systems use air as the fluid medium – Say True or False
- \_\_\_\_\_ type of bearing is used in extruder for screw assembly?
- A check valve is a \_\_\_\_\_ control valve
- \_\_\_\_\_ heaters are used on barrels of Injection moulding machines.

**PART – B**

Answer **all** questions (Max. 40 words)

4 x 2 = 8

- Define thermocouple?
- Define Predictive maintenance?
- What is OLR and its purpose?
- What is bearing? State its types.

**PART – C**

Answer any **six** questions (Max. 100 words)

6 x 4 = 24

- Name different types of heaters used in Injection Moulding Machine?
- Explain the importance of maintenance?
- What is the primary function of Central lubrication system used in automatic Injection moulding machine? State its advantages?
- Compare electromagnetic relay (EMR) with solid state relay (SSR).
- What are the applications of mill roll?
- Define actuators? Write the different types of actuators?
- Explain the safety rules that to be followed in processing shop floor.

**PART – D**

Answer any **two** questions (Max. 300 words)

2 x 8 = 16

- List out the main factors to be considered during installation & commissioning of Plastics Processing and Testing machineries?
- Explain briefly the following:  
a) Metering and flow control valves,    b) Pascal's law    c) Induction motors,    d) Limit Switches & Timers,
- Explain the method of Platen Parallelism measurement?

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**FIFTH SEMESTER EXAMINATION – JANUARY - 2024**

Duration : 3 Hours  
Course : DPT  
Subject : Plastics Testing-II

Max. Marks: 60  
Date : 12.01.2024  
Time : 02.00 p.m. to 05.00 p.m.

**(DO NOT CHANGE SEQUENCE OF QUESTION NUMBER IN ANSWER SCRIPT)**

**PART – A**

Answer **all** questions

12 x 1 = 12

- 1) Which one of the following is correct test method for Biodegradation test?  
(a) ASTM D 238 (b) ASTM D 6868 (c) ASTM D 149 (d) ASTM D 249
- 2) The IS standard for testing of UPVC pipes is  
(a) IS 4975 (b) IS 4995 (c) IS 4984 (d) IS 4985
- 3) Reagent used in ESCR Test is  
(a) Distilled Water (b) Ammonium Chloride (c) Hydrogen Peroxide (d) Igepal co 630
- 4) The specimen size for ESCR test is \_\_\_\_\_
- 5) The unit of surface resistance is \_\_\_\_\_
- 6) The dielectric strength \_\_\_\_\_ with increase in the temperature of the specimen.
- 7) The Standard test method for Specular Gloss is ASTM D 523. (True or False)
- 8) Dissipation factor is directly proportional to Frequency (True or False)
- 9) In water storage tanks carbon black is used as Thermal stabilizer (True or False)
- 10) OIT stands for \_\_\_\_\_
- 11) Write the Full form of ASTM \_\_\_\_\_
- 12) ESCR stands for \_\_\_\_\_

**PART – B**

Answer **all** questions (Max. 40 words)

4 x 2 = 8

- 1) Define dielectric strength.
- 2) What is the significance of smoke density?
- 3) What is Haze?
- 4) Define flammability?

**PART – C**

Answer any **six** questions (Max. 100 words)

6 x 4 = 24

- 1) Differentiate between Conductor and Insulator.
- 2) Discuss the factors affecting the Volume resistivity.
- 3) Discuss the test procedure used to determine the sulphated ash content of UPVC pipe.
- 4) Discuss the method for OIT test of HDPE pipe as per IS 4984.
- 5) Write the advantages and disadvantages of biodegradable polymer.
- 6) Discuss the principle and factor affecting the luminous transmittance test.
- 7) Discuss the Principle & Significance of CTI.

**PART – D**

Answer any **two** questions (Max. 300 words)

2 x 8 = 16

- 1) What is biodegradable plastic? Discuss any test method for determination of biodegradation.
- 2) Describe in details about the test method for determination of VSP of UPVC pipe.
- 3) Discuss the significance, procedure and factors affecting the Arc resistance test.

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