

techniques. Explain

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

Duration: 3 Hours Max. Marks: 60
Course: DPT Date: 09.01.2024

| Subject   | : Plastics Recycling & Waste Management  | Time : 02.00 p.m. to 05.00 p.m.             |
|-----------|--|---|
|           | (DO NOT CHANGE SEQUENCE OF QUESTION NUM<br>PART – A  | MBER IN ANSWER SCRIPT)                      |
|           | Answer <b>all</b> questions  | 12 x 1 = 12                                 |
| 4 T. C.   |  |   |
|           | ry recycling techniques is widely practicized for? PMMA (b) PE (c) PVC (c)   | d) None of these                            |
|           | cutters is used for low toughness(Polymer foam)  |   |
|           | Plastics can be separated by NIR .Say True/False   |   |
| 4. Which  | n property is used to separate different plastics in sink and  |   |
| (a)       | Size (b) Volume (c) Density  | (d) Shape                                   |
|           | g techniques is based on the Chemical, optical, electrical (False  | or physical property of Plastics waste. Say |
|           | raise<br>flotation techniques are most effective method to separate  | which of the given plastics?                |
| (a)       | PVC (b) HDPE (c) Nylon   |   |
|           | eviates the SUP  |   |
|           | tive Dissolution segregation is useful for durable goods su  | ch as carpets, consumer electronics and     |
|           | nobile components. Say True/False  |   |
|           | of the following materials sinks in water  | (d) DC                                      |
| (a)       | PP (b) LDPE (c) HDPE vaste generated is estimated % of the plastics  | (d) PS                                      |
|           | the full form of PCW   | o consumption in Agriculture.               |
|           | ry recycling is also known as  |   |
|           |  |   |
|           | PART – B   | words) $4 \times 2 = 8$                     |
|           | Answer <b>all</b> questions (Max. 40   | words) 4 x 2 = 6                            |
| 1. What i | s Solid waste and give its example?  |   |
|           | eflectance spectroscopy is works in Plastics waste sorting?  |   |
|           | s source of plastics waste in polymer manufacture?   |   |
| 4. Which  | process is most suitable for size reduction of film waste ar   | nd why?                                     |
| •         | PART – C   |   |
|           | Answer any <b>six</b> questions (Max. 1  | $6 \times 4 = 24$                           |
|           | The state of the s | ,   |
| 1 What i  | s melt filtration separation?  |   |
|           | s the role of pyrolysis in plastics recycling?   |   |
|           | are the additives for improving the quality of recycled produ  | ucts?                                       |
|           | short notes on guidelines for recycling of Plastics Waste.   |   |
|           | low chart for PP/HDPE woven sacks to Pot?  |   |
|           | s Monomer to Monomer approach in plastics waste recyclic   |   |
| 7. what   | s the role of Shredder, Agglomerator, Force Feeder and E   | xtruder in Mechanical recycling plant?      |
|           | PART – D   |   |
|           | Answer any <b>two</b> questions (Max.  | 300 words) $2 \times 8 = 16$                |
|           |  |   |
|           | s recycling and its types? How recycling codes is helpful in   |   |
|           | he process flow chart for Chemical recycling plant? Explai<br>short notes on Segregation of plastics waste by simple ide   |   |



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

| Subject  | : Maintenance of Plastics Processing & Testing Equipments | Time   | : 02.00 p.m. to 05.00 p.n |
|----------|---|--------|---------------------------|
| Course   | : DPT   | Date   | : 10.01.2024              |
| Duration | : 3 Hours   | Max. I | Marks: 60                 |

| Course : DPT<br>Subject : Maintenance   | of Plastics Processing &         | Testing Equipments              |               | : 10.01.2024<br>: 02.00 p.m. to | o 05.00 p.m.       |
|---|----------------------------------|---------------------------------|---------------|---------------------------------|--------------------|
| (DO NOT C                               | HANGE SEQUENCE O                 |                                 | R IN AN       | SWER SCRIPT                     | <u>)</u>           |
|   |                                  | PART – A                        |               |                                 |                    |
|   |                                  | er all questions                |               |                                 | $12 \times 1 = 12$ |
| 1. Output of thermocoup                 |                                  |                                 |               |                                 |                    |
| <ul><li>a) Micro ampere</li></ul>       | <ul><li>b) Micro volts</li></ul> | <ul><li>c) Millivolts</li></ul> |               | d) Milliohm                     | S                  |
| 2. Limit switch is                      | _ operated device.               |                                 |               |                                 |                    |
| <ul><li>a) Mechanical</li></ul>         | b) Electro,                      | c) Electronic                   | d) Nor        | ne of these                     |                    |
| 3. What is NO and NC?                   |                                  |                                 |               |                                 |                    |
| 4. Expand the term FRL                  | used in a pneumatic system       | 1.                              |               |                                 |                    |
| 5. What do you mean by                  |                                  |                                 |               |                                 |                    |
| 6. Medium voltage circui                |                                  | range of                        | volts         |                                 |                    |
| a) 300 to 750V                          |                                  | c) 800 to 10000                 |               | ) None                          |                    |
| 7. A hydraulic Actuator is              |                                  |                                 |               |                                 | V                  |
| True or Fa                              |                                  | it riyaraano onorgy mi          | o ivicoriai   | noar cricigy sa                 | y                  |
| 8. Open loop control is a               |                                  | which the output of th          | an evetom     | ie not monit                    | ored or            |
|   |                                  | i willon the output of th       | ic system     | 1 15 1101 11101111              | Jieu oi            |
| fed back to the input.                  |                                  | n Cou True or Folce             |               |                                 |                    |
| 9. Pneumatic Systems u                  |                                  |                                 |               |                                 |                    |
| 10 type                                 |                                  |                                 | nbiy?         |                                 |                    |
| 11. A check valve is a                  |                                  |                                 |               |                                 |                    |
| 12 heaters a                            | are used on barrels of Inj       | ection moulding mach            | ines.         |                                 |                    |
|   | _                                |                                 |               |                                 |                    |
|   |                                  | ART – B                         |               |                                 |                    |
|   | Answer <b>all</b> q              | uestions (Max. 40 wor           | rds)          |                                 | $4 \times 2 = 8$   |
|   |                                  |                                 |               |                                 |                    |
| <ol> <li>Define thermocouple</li> </ol> |                                  |                                 |               |                                 |                    |
| <ol><li>Define Predictive ma</li></ol>  | aintenance?                      |                                 |               |                                 |                    |
| 3. What is OLR and its                  | purpose?                         |                                 |               |                                 |                    |
| 4. What is bearing? Sta                 | ate its types.                   |                                 |               |                                 |                    |
|   |                                  | PART – C                        |               |                                 |                    |
|   |                                  | questions (Max. 100 v           | words)        |                                 | $6 \times 4 = 24$  |
|   | ,                                |                                 | ,             |                                 |                    |
|   |                                  |                                 | _             |                                 |                    |
|   | s of heaters used in Injec       | tion Moulding Machine           | 9?            |                                 |                    |
| <ol><li>Explain the importan</li></ol>  |                                  |                                 |               |                                 |                    |
| <ol><li>What is the primary f</li></ol> | function of Central lubrication  | ation system used in a          | utomatic      | Injection mould                 | ling               |
| machine? State its a                    | dvantages?                       |                                 |               |                                 |                    |
| 4. Compare electromag                   | gnetic relay (EMR) with s        | olid state relay (SSR).         |               |                                 |                    |
| 5. What are the applica                 |                                  | , ,                             |               |                                 |                    |
|   | rite the different types of      | actuators?                      |               |                                 |                    |
|   | les that to be followed in       |                                 |               |                                 |                    |
| 7. Explain the datety ra                | ico triat to bo rollowed in      | processing energineer           | •             |                                 |                    |
|   |                                  | PART – D                        |               |                                 |                    |
|   | Answer any two                   | questions (Max. 300             | words)        |                                 | 2 x 8 = 16         |
|   | Allower arry two                 | - questions (max. 500           | 110103)       |                                 | 2 7 0 - 10         |
| 1 List out the main fac                 | tors to be considered du         | ring inetallation & com         | mieeinnin     | n of Plaetice                   |                    |
|   |                                  | ing installation & com          | 1111331011111 | y or r lastics                  |                    |
| Processing and Test                     |                                  |                                 |               |                                 |                    |
| 2. Explain briefly the fo               |                                  |                                 |               | atv 1 (a. 2)                    | b 0 T'             |
|   | control valves, b) Paso          |                                 | n motors,     | d) Limit Switc                  | nes & Timers,      |
| 3. Explain the method of                | of Platen Parallelism mea        | asurement?                      |               |                                 |                    |

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

Duration: 3 Hours Max. Marks: 60 Course : DPT Date : 11.01.2024

| ıbjec                          | : Plastics Processing Technology-II  |  | Time            | : 02.00 p.m. t   | o 05.00 p.m. |
|--------------------------------|--|--|-----------------|------------------|--------------|
|                                | (DO NOT CHANGE SEQUENCE OF QUI   |  | N ANS           | SWER SCRIPT      | <u>[]</u>    |
|                                | PAR<br>Answer all  |  |                 |                  | 12 x 1 = 12  |
| 2. \                           | Which of the following thermoforming process hat a. a) Vacuum forming b. c) Pressure forming Which of the following is not a type of Calendar a) 'L' type b) 'E' type Which one of the following combination is an est   | <ul><li>b) Drape forming</li><li>d) Die Match form</li><li>c) 'Z' type</li><li>sential part of a com</li></ul> | ning<br>nposite | d) 'F' type<br>? |              |
| 5. <sup>-</sup><br>6.          | a) Filler and pigments     c) Plastic resin and reinforcement Pulverizing process is related to  The function of Transducer in Ultrasonic welding RIM stands for  Gas assisted injection molding Nitrogen Gas use  | is   | abilize         |                  |              |
| 8. l<br>9. l<br>10. \<br>11. ( | Robots can help in increasing productivity by red<br>Melt spinning is a process for producing filament<br>WAIM stands for<br>BRP stands for<br>Abbreviate: MEKP  | ducing dead time. Sa   | ay Tru          | e or False       |              |
|                                | PART -<br>Answer <b>all</b> question   | <u>- B</u><br>ons (Max. 40 words)  | )               |                  | 4 x 2 = 8    |
| 2.<br>3.                       | What is the Hot stamping? Write advantage of all electric injection moulding Name any four types of thermoforming process State two merits of pultrusion?  |  |                 |                  |              |
|                                | PAR<br>Answer any <b>six</b> ques  |  | ds)             |                  | 6 x 4 = 24   |
| 2.                             | Briefly explain Thermoforming process and write on the quality of product.  Explain the process Reaction Injection Mouldir Compare and contrast rotational moulding with Write the Process Cycle of Gas Assisted Inject Write down the merits & demerits of compress Define Lost core Moulding? What are the mate Explain the process of Powder Coating? | ng<br>n blow moulding.<br>tion Moulding Proce<br>ion moulding proces   | SS.             |                  | ters         |
|                                | PAR<br>Answer any <b>two</b> ques  |  | rds)            |                  | 2 x 8 = 16   |
|                                | Explain structural foam injection moulding with i<br>Briefly explain with neat sketch about<br>a) Co-injection moulding b) Liquid Ro   | neat sketch and writ   | e its a         | dvantages & L    | imitations   |
| 2                              | Explain the Potational Moulding process with n   |  | tha ad          | venteges and     |              |

3. Explain the Rotational Moulding process with neat sketch. Outline the advantages and disadvantages of Rotational Moulding.

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Duration: 3 Hours Max. Marks: 60 Course : DPT Date : 12.01.2024

Subject : Plastics Testing-II Time : 02.00 p.m. to 05.00 p.m.

| (DO NOT CHANGE SEQUENCE OF QUESTION NUMBER IN ANSWER SCRIPT)   |  |  |  |  |
|--|--|--|--|--|
| PART – A   |  |  |  |  |
| Answer <b>all</b> questions $12 \times 1 = 12$   |  |  |  |  |
| <ol> <li>Which one of the following is correct test method for Biodegradation test?         <ul> <li>(a) ASTMD 238</li> <li>(b) ASTMD 6868</li> <li>(c) ASTMD 149</li> <li>(d) ASTMD 249</li> </ul> </li> <li>The IS standard for testing of UPVC pipes is         <ul> <li>(a) IS 4975</li> <li>(b) IS 4995</li> <li>(c) IS 4984</li> <li>(d) IS 4985</li> </ul> </li> <li>Reagent used in ESCR Test is</li> </ol>  |  |  |  |  |
| <ul> <li>(a) Distilled Water</li> <li>(b) Ammonium Chloride</li> <li>(c) Hydrogen Peroxide</li> <li>(d) Igepal co 630</li> </ul> 4) The specimen size for ESCR test is   |  |  |  |  |
| 6) The dielectric strength with increase in the temperature of the specimen. 7) The Standard test method for Specular Gloss is ASTMD 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 <b>all</b> questions (Max. 40 words) 4 x 2 = 8  |  |  |  |  |
| <ol> <li>Define dielectric strength.</li> <li>What is the significance of smoke density?</li> <li>What is Haze?</li> <li>Define flammability?</li> </ol>   |  |  |  |  |
| PART – C   |  |  |  |  |
| Answer any $six$ questions (Max. 100 words) 6 x 4 = 24   |  |  |  |  |
| <ol> <li>Differentiate between Conductor and Insulator.</li> <li>Discuss the factors affecting the Volume resistivity.</li> <li>Discuss the test procedure used to determine the sulphated ash content of UPVC pipe.</li> <li>Discuss the method for OIT test of HDPE pipe as per IS 4984.</li> <li>Write the advantages and disadvantages of biodegradable polymer.</li> <li>Discuss the principle and factor affecting the luminous transmittance test.</li> <li>Discuss the Principle &amp; Significance of CTI.</li> </ol> |  |  |  |  |
| <u>PART – D</u>  |  |  |  |  |
| Answer any <b>two</b> questions (Max. 300 words) 2 x 8 = 16  |  |  |  |  |
| <ol> <li>What is biodegradable plastic? Discuss any test method for determination of biodegradation.</li> <li>Describe in details about the test method for determination of VSP of UPVC pipe.</li> <li>Discuss the significance, procedure and factors affecting the Arc resistance test.</li> </ol>  |  |  |  |  |

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