20-221

CENTRAL INSTITUTE OF PETROCHEMICALS ENGINEERING & TECHNOLOGY
HEAD OFFICE : GUINDY, CHENNAI – 600 032.
ACADEMIC CELL
SECOND SEMESTER EXAMINATION – JULY 2024

Duration : 3 Hours | Max. Marks: 60
Course : PGD-PPT | Date : 01.07.2024
Subject : Plastics Materials & its Applications - II | Time : 10.00 a.m. to 01.00 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 water soluble material
   a) Methyl cellulose b) carboxymethyl cellulose c) hydroxyl ethylcellulose d) All the above
2. The applications of Biodegradable polymer include _____
   a) Dental b) Pharmaceutical c) Tissue Scaffolds d) All of the above
3. Density of LCP is?
   a) 0.9~1.3 g/cm3 b) 1.4~1.8 g/cm3 c) 1.0~1.4 g/cm3 d) All of the above
4. Kapton is the trade name of Polyamide. Say True or False.
5. Polysulphone is used in microwave oven parts. Say True or False.
6. E-caprolactam is the monomer for Nylon 66. Say True or False.
7. Victrex is the trade name of _____
8. Miscible polymer blend is associated with _____
9. Bakelite is the trade name of _____ resin
10. Expand DGEBA
11. Expand LCP
12. Expand PEEK

PART – B

Answer **all** questions (Max. 40 words) 4 x 2 = 8

1. Give few examples of synthetic bio-degradable polymers.
2. Define thermoset polymer. Give two characteristic features of Phenolics.
3. What is meant by compostable plastics?
4. What are the factors affecting the degradation of polymer?

PART – C

Answer any **six** questions (Max. 100 words) 6 x 4 = 24

1. What are Nano materials? Classify with example.
2. Write characteristics and application of LCP.
3. Explain Novolak and Resol. Differentiate and explain with two applications.
4. Write a Short Note on a) PEEK b) PI
5. Differentiate between Bio plastic and Bio Polymers.
6. Explain plastic degradation. Give few examples of synthetic bio-degradable polymers.
7. Write a short note on properties and applications of epoxy polymer. Explain curing system.

PART – D

Answer any **two** questions (Max. 300 words) 2 x 8 = 16

1. What are specialty Plastics? Discuss Manufacturing, structure, properties and application of PEEK.
2. Explain the manufacturing of LCP? write the properties and applications in detail.
3. Write short note on a) Bio Plastics b) Water Soluble Polymers.

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ACADEMIC CELL
SECOND SEMESTER EXAMINATION – JULY 2024

Duration : 3 Hours | Max. Marks: 60
Course : PGD-PPT | Date : 02.07.2024
Subject : Plastics Processing Technology-II | Time : 10.00 a.m. to 01.00 p.m.

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

PART – A

Answer **all** questions 12 x 1 = 12

1. Hollow structure PVC doors are made by
   (a) Extrusion (b) Blow Moulding (c) Injection Moulding (d) Calendaring
2. What will be the size of the mesh used for screen pack in extrusion
   (a) 40 to 80 (b) 80 to 120 (c) 120 above (d) below 40
3. Thermoforming process usually uses _____ type materials.
   (a) Thermoset (b) Thermoplastic (c) Composite (d) Elastomers
4. Thermoforming process with the help of compressed air is termed as _____
5. The four types of calendars are L – type, inverted L – type, _____ and_____ type
6. Powder Coating is a type of coating that is applied as a free-flowing _____
7. The product made by calendaring technique include Films and Sheets. Say True or False
8. Thermoforming is a secondary processing technique. Say True or False
9. In parison programming die bush part of the die is moved up and down. Say True or False
10. EBM Stands for
11. DWC stands for
12. BUR stands for

PART – B

Answer **all** questions (Max. 40 words) 4 x 2 = 8

1. What do you understand by compression ratio?
2. Write the type of dies for Flat film Casting
3. Write the functions of Breaker Plate in Extruder.
4. Write the function of blow pin in extrusion blow moulding process?

PART – C

Answer any **six** questions (Max. 100 words) 6 x 4 = 24

1. Explain Twin screw extruder with a neat sketch
2. List out the methods of Heating the extruders and explain any one method
3. State the difference between pressure thermoforming and Drape Thermoforming.
4. Explain parison programming with its neat sketch.
5. Write the troubleshooting in calendaring process.
6. Write the name of all types of thermoforming process and explain any one of them with neat sketch.
7. What is plate out in case of calendaring? Mention types of calendars.

PART – D

Answer any **two** questions (Max. 300 words) 2 x 8 = 16

1. Explain the working principle of Single screw extruder with neat sketch
2. Write short notes on
   a) Powder coating b) High Speed Mixer
3. Explain the Extrusion Blow Moulding Process with neat sketch.

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HEAD OFFICE : GUINDY, CHENNAI – 600 032.
ACADEMIC CELL
SECOND SEMESTER EXAMINATION – JULY 2024

Duration : 3 Hours | Max. Marks: 60
Course : PGD-PPT | Date : 03.07.2024
Subject : Plastics Testing-II | Time : 10.00 a.m. to 01.00 p.m.

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

PART – A

Answer **all** questions 12 x 1 = 12

1. The ASTM D standard for Haze measurement is
2. Rectangular bar size specimen is preferred for
   (a) Tensile (b) Flexural (c) VSP (d) Compressive
3. Acetone Immersion test is used for HDPE products .Say True/False
4. Which type of hardness test is most suitable for Nylon?
   (a) Rockwell Hardness (b) Shore A Hardness (c) Shore D hardness (d) All of these
5. Microscopic method is used for refractive index measurement. Say True/False
6. ASTM D Test Method for Water absorption of Plastics is _____
7. Unit of arc resistance is
   (a) Ohms (b) Volts (c) watts (d) Secs
8. Expand DMA stands for _____.
9. Spectrophotometer is used for Colour measurement. Say True/False
10. Determining the ability of as insulator to store electrical energy is known _____
11. Luminous transmittance is the ratio of
    (a) Diffuse Transmittance/Total Transmittance (b) Apparent Depth/Actual Depth
    (c) Incident light/Transmitted light (d) None of these
12. UTM is used for the determination of _____

PART – B

Answer **all** questions (Max. 40 words) 4 x 2 = 8

1. Define Surface resistivity and its unit
2. What is DSC and its role in material analysis?
3. What is Shear Strength and its ASTM method ?
4. Define Gloss and its factors affecting.

PART – C

Answer any **six** questions (Max. 100 words) 6 x 4 = 24

1. Differentiate between Creep and Stress Relaxation
2. Define Abrasion resistance and its testing procedure?
3. What is Immersion test? Explain in details
4. Define Arc resistance and its testing procedure
5. What is GTR and its testing Procedure?
6. What is Coefficient of friction? Explain its types
7. What is Refractive Index its significance and factors affecting?

PART – D

Answer any **two** questions (Max. 300 words) 2 x 8 = 16

1. What is ESCR and its significance? Explain in details about its test method, testing procedure and its factors affecting.
2. Draw the Stress Vs Strain Curve. Explain in details about the curve. Classify the material depending upon the Stress Vs Strain Curve
3. Write short notes (a) Water absorption of Plastics (b) Stain resistance of Plastics

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HEAD OFFICE : GUINDY, CHENNAI – 600 032.
ACADEMIC CELL
SECOND SEMESTER EXAMINATION – JULY 2024

Duration : 3 Hours | Max. Marks: 60
Course : PGD-PPT | Date : 04.07.2024
Subject : Machine Maintenance | Time : 10.00 a.m. to 01.00 p.m.

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

PART – A

Answer **all** questions 12 x 1 = 12

1. Maintenance consist of the following action (s)
   (a) Replace of component (b) Repair of component (c) Service of component (d) All of the above
2. In which of the following drives, there is no slip
   (a) Open belt drive (b) Crossed belt drive (c) Rope drive (d) Chain drive
3. For Starting of above10HP motors ----------starter is used
   (a) DOL (b) Star delta (c) Transformer type (d) All the above
4. Pressure of 1 bar is equal to____ PSI
5. Piston pump is ---------- displacement pump.
6. The device used to convert AC to DC is_____
7. Lubrication comes under Preventive maintenance .Say True/False.
8. Copper is a good conductor electricity. Say True/False.
9. FRL unit is used in pneumatic circuit. Say True/False .
10. Expand MTC.
11. Expand DOL.
12. Expand NRV.

PART – B

Answer **all** questions (Max. 40 words) 4 x 2 = 8

1. What are the application of Gears?
2. What are the advantages of Preventive maintenance?
3. What is the application of Thermocouple?
4. What are the functions of ACB?

PART – C

Answer any **six** questions (Max. 100 words) 6 x 4 = 24

1. List and explain the safety rules of the shop floor.
2. Draw a neat sketch of Gear pump and explain its functions.
3. Draw a neat sketch of a Direction control valve and explain its functions.
4. Discuss about function and application of Mould Temperature Controller .
5. Explain about the working principle of star delta starter with neat sketch.
6. Explain the working of bridge rectifier with neat sketch.
7. Discuss about the types and application of limit switches.

PART – D

Answer any **two** questions (Max. 300 words) 2 x 8 = 16

1. List the different types of maintenance and explain about the preventive maintenance in detail.
2. List the types of mechanical power transmission and explain about any one in detail with sketches.
3. Discuss about principle and functions of electric induction motor with neat sketch.

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ACADEMIC CELL
SECOND SEMESTER EXAMINATION – JULY 2024

Duration : 3 Hours | Max. Marks: 60
Course : PGD-PPT | Date : 05.07.2024
Subject : Environmental Science and Plastics Waste Management | Time : 10.00 a.m. to 01.00 p.m.

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

PART – A

Answer **all** questions 12 x 1 = 12

1. A major compound responsible for the destruction of stratospheric ozone layer is
   (a) Oxygen (b) Carbon dioxide (c) CFC (d) Methane
2. The removal of carbon dioxide from the earth's atmosphere and the provision of long-term storage of carbon in the terrestrial biosphere is known as
   (a) Carbon sequestration (b) Carbon dating (c) Carbon fixing (d) Photosynthesis
3. POPs is
   (a) Persistent Oxidizing Pollutants (b) Permanent Organic Pesticides
   (c) Persistent Organic Pesticides (d) Persistent Organic Pollutants
4. The most common stratospheric ozone measurement unit is the_____ (Fill in the blank)
5. Classical smog occurs in cold and humid climate, and it is _____in nature (Fill in the blank: Reducing/ Oxidizing).
6. _____is a zone of junction or transition between two or more diverse ecosystems. For e.g. the mangrove forests (Fill in the blank: one word only)
7. In automobiles, catalytic convertor treats carbon monoxide to carbon dioxide and nitric oxide to nitrogen gas. (say true or false)
8. Deforestation has no impact on the carbon cycle. (say true or false)
9. Sustainable development aims to meet present needs without compromising the ability of future generations to meet their own needs. (say true or false)
10. Write full form of UNEP.
11. What is full form of "WTE" abbreviation used in plastics waste management?
12. Provide the expanded form of the abbreviation "3Rs."

PART – B

Answer **all** questions (Max. 40 words) 4 x 2 = 8

1. Write components of forest.
2. What is acid rain?
3. What is food security? What are three conditions that must be fulfilled to ensure food security.
4. Define "Global Warming".

PART – C

Answer any **six** questions (Max. 100 words) 6 x 4 = 24

1. Plastics waste in road construction: describe process with systematic diagram.
2. What is "plastic waste management"? Give classification of main polymer recycling methods.
3. What are the major sources of energy? Define renewable, non-renewable and sustainable energy sources.
4. What is thermal pollution? Write causes and effects of thermal pollution.
5. Write note on "chain extenders" and "compatibilizers" additives used in plastics recycling.
6. Write four major air pollutants, its characteristics and effects.
7. List the different environment protection acts..

PART – D

Answer any **two** questions (Max. 300 words) 2 x 8 = 16

1. Write note on Water Conservation (definition, importance and strategies)
2. What is plastics recycling? Discuss mechanical recycling of plastics with proper diagram.
3. Give any six key conditions of Plastics Waste Management Rule 2011 in India. Write guidelines for EPR, carry bags, multilayer plastics packaging, and single use plastics according to Plastics Waste Management Rule 2016 (Amendment 2016).

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