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PRESIDENCY UNIVERSITY BENGALURU

SCHOOL OF INFORMATION SCIENCE

MAKE UP EXAMINATION - JULY 2024

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| **Semester : VI** | **Date : 05/07/2024** |
| **Course Code : PET 406** | **Time : 9:30 AM to 12:30 PM** |
| **Course Name :** **Polymer Technology** | **Max Marks : 100** |
| **Program : B.Tech** | **Weightage : 50%** |

**Instructions:**

1. *Read all questions carefully and answer accordingly.*
2. *Question paper consists of 3 parts.*
3. *Scientific and non-programmable calculator are permitted.*
4. *Do not write any information on the question paper other than Roll Number.*

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| **PART A** | | | |
| **ANSWER ANY 5 QUESTIONS 5Q X 2M=10M** | | | |
| 1 | Explain the process of polymerization and distinguish between addition and condensation polymerization. | (CO1) | [Knowledge] |
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| 2 | Discuss the role of catalysts in polymer technology. How do they influence the polymerization process and the properties of the resulting polymers? | (CO1) | [Knowledge] |
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| 3 | What are copolymers and how do their properties differ from homopolymers? Provide examples and applications. | (CO2) | [Knowledge] |
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| 4 | Describe the mechanical properties of polymers and how they are influenced by factors such as molecular weight, crosslinking, and crystallinity. | (CO3) | [Knowledge] |
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| 5 | What are biodegradable polymers, and what are their advantages and limitations compared to conventional polymers? | (CO3) | [Knowledge] |
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| 6 | How are nanocomposites in polymer technology created, and what benefits do they offer over traditional composites? | (CO4) | [Knowledge] |
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| 7 | Discuss the significance of thermal properties in polymers and the methods used to measure them. | (CO4) | [Knowledge] |
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| **PART B** | | | |
| **ANSWER ANY 5 QUESTIONS 5Q X 10M=50M** | | | |
| 8 | Define polymer blends and alloys and differentiate them from copolymers. Discuss the techniques used to create blends and alloys and their advantages in terms of enhanced properties. Provide examples of common polymer blends and their uses in industry. | (CO1) | [Comprehension] |
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| 9 | Discuss the environmental concerns related to the production, use, and disposal of synthetic polymers. Address the health implications of exposure to certain polymers and additives. Highlight the strategies and innovations being employed by the industry to mitigate these issues, such as recycling, development of green polymers, and regulations. | (CO2) | [Comprehension] |
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| 10 | Describe various polymer processing techniques (e.g., extrusion, injection molding, blow molding, thermoforming) and how they impact the final properties of the polymer product. Discuss how processing parameters can be optimized to achieve desired characteristics in polymer materials for specific applications. | (CO2) | [Comprehension] |
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| 11 | What is the possible effect of radiation on polymer stability? | (CO3) | [Comprehension] |
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| 12 | With derivation and graphical representation prove that step growth polymerization occurs faster in presence of catalyst. | (CO3) | [Comprehension] |
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| 13 | Chain entanglement is found in which polymer state? Explain its significance for the same. | (CO4) | [Comprehension] |
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| 14 | Write down the characteristic property of a good plasticizer. Give examples of good plasticizer. | (CO4) | [Comprehension] |
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| **PART C** | | | |
| **ANSWER ANY 2 QUESTIONS 2Q X 20M=40M** | | | |
| 14 | A businessman wants to set a factory for making plastic toy bricks. He appoints an engineer to suggest the process and machinery for manufacturing. Considering yourself as the appointed engineer, which processing operation will you suggest for manufacturing, molding or extrusion? | (CO2) | [Application] |
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| 15 | A component ‘X’ was provided to Sachin to prepare a polymer with X as monomer. The functionality of X is 1. Will Ramesh be able to prepare a polymer? If not, why? | (CO3) | [Application] |
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| 16 | Describe thermal degradation and mention the factors affecting the thermal stability of polymers. Also explain chain and random degradation of polymers with examples. | (CO4) | [Application] |