

## M.Sc. (Sem.-IV) Examination

508

## Polymer Science

April-2017

Time : 3 Hours]

[Max. Marks : 70

Q-1	A	Although the primary bond strength of most Inorganic Polymers are high, very few are useful as Heat Resistant Polymers. Explain, Why.	[7]
		<b>OR</b>	
Q-1	A	Discuss On: (I) Burning Mechanism of Polymers (ii) Fluoropolymers (iii) Polysulfones.	[7]
Q-1	B	Write Notes On: (I) Ladder Polymers as Heat Resistant Polymers (ii) LOI (iii) Polyimides	[7]
		<b>OR</b>	[7]
Q-1	B	What are the general methods to improve the Fire Resistance of polymers?	
Q-2	A	Explain the Preparation, Structure & Properties of Polyparaphenylene and Polypyryrole?	[7]
		<b>OR</b>	
Q-2	A	Aromatic Polyamides belong to Liquid Crystalline Polymers (LCP). Justify.	[7]
Q-2	B	What are Conducting Polymers? Write short note on Doping Process used in conducting Polymers.	[7]
		<b>OR</b>	
Q-2	B	What are Photoresists? Explain Positive and negative photoresists. Give their applications.	[7]
Q-3	A	Which polymeric materials are used in the making of Membranes? State the various applications of Polymeric Membranes.	[7]
		<b>OR</b>	
Q-3	A	Explain in Details: Elastomeric & Polyaromatic Backbone based Ionomers.	[7]
Q-3	B	Describe the Classification Of Ionomers? Give Applications of Ionomers.	[7]
		<b>OR</b>	
Q-3	B	Give short note on Polyelectrolyte, Biological and Inorganic Ionic Polymers.	[7]
Q-4	A	What is a Polymer Concrete? State its advantages and disadvantages. State its applications. What are Polymers Impregnated Concretes?	[7]
		<b>OR</b>	
Q-4	A	List the various Polymers used in Biomedical Devices with corresponding Biomedical uses and properties.	[7]
Q-4	B	What is Telecommunication? Define Fiber Optics. Where are they used? State the principle used in Fiber Optic Cables.	[7]
		<b>OR</b>	[7]
Q-4	B	What is Polymer Gel? Explain its Application With Suitable Examples.	
Q-5		Answer Following Question.	[14]
		<ol style="list-style-type: none"> <li>1. Explain Piezoelectric and Pyroelectrical properties of Polymers.</li> <li>2. What are Propellants Binders? Give its examples.</li> <li>3. Define Photoactive Polymers with examples.</li> <li>4. Explain Nonlinear Optical Properties Of Polymers.</li> <li>5. Why Halogenated additives are not used in Fire Resistance Polymer?</li> <li>6. Discuss the Uses of Polymers in Agricultural Applications.</li> <li>7. What is Specialty Polymers?</li> </ol>	

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Q-1-a	What is importance of testing? Explain the standards and specification. <b>OR</b>	7
Q-1-a	Explain the significance, equipments, procedure and factor affecting of Compression moulding for specimen preparation	7
Q-1-b	Define Impact strength? Explain the Tensile Impact test procedure and factors affecting the test results. <b>OR</b>	7
Q-1-b	Explain the Shear strength test in detail.	7
Q-2-a	Define abrasion resistance? Explain the Taber abrasion test in detail. <b>OR</b>	7
Q-2-a	Define Hardness? Explain the Rockwell hardness test in detail.	7
Q-2-b	What is HDT? Describe the test method as per ASTM D 648 and what are the factors affects on HDT ? <b>OR</b>	7
Q-2-b	Define Thermal Conductivity. Describe a method for determining the thermal conductivity of a plastic test specimen.	7
Q-3-a	Define dielectric strength. How do you determine it for plastics? <b>OR</b>	7
Q-3-a	What is LOI?. Explain the test procedure to conduct this Test	7
Q-3-b	Define WVTR? Explain the test procedure and factors affecting on test results. <b>OR</b>	7
Q-3-b	Explain the CLTE test in detail.	7
Q-4-a	Define haze and gloss. Explain the test procedure for determination of gloss <b>OR</b>	7
Q-4-a	Why is ESCR test require for PR based product.?explain test procedure in detail	7
Q-4-b	Define arc resistance. explain the test procedure and factors affecting on test result <b>OR</b>	7
Q-4-b	Enlist the various tests conducted on plastic films. Explain Coefficient of friction test in detail.	7
Q-5	Answer the following questions in short. 1. Resistance to deformation under constant load with respect to time is called as _____. 2. Area under Stress-strain curve is called _____. 3. Ratio of stress to corresponding strain in stress-strain curve is called _____. 4. R L M E K are the scales used for _____ test 5. The data obtained by HDT method cannot be used to predict the behavior of plastics materials at elevated temperature-Say True or False 6. Select a hard and tough material out of the following? a) PC b) PP c) Nylon-6 d) POM 7. Combined characteristics of fusion under pressure, melt viscosity and gelation rate under specific conditions for Thermoset material is studied by _____ test. 8. What is the unit of Coefficient of Thermal Conductivity (K)? 9. Guarded Hot Plate Apparatus is used for measuring _____? 10. Which type of hardness test is most suitable for flexible PVC? a) Durometer Shore Hardness b) Rockwell c) Barcol d) None of the above 11. Which of the following ASTM test method is applicable for Cup Flow test? a) ASTM D785 b) ASTM D570 c) ASTM D3123 d) ASTM D731 12. The change in length per unit length of a material per degree change in temp. is called _____. 13. MFI is directly proportional to Viscosity- Say True or False 14. Shear Strength expressed in _____ a) N/mm <sup>2</sup> b) kgf/cm <sup>2</sup> c) MPa d) All of the above	14