

M.Sc. Sem.-1 Examination
PHY : 405 : Polymer Science
Conducting Polymer

Time : 2-00 Hours]

April 2021

[Max. Marks : 50

Instruction: All questions in **section-I** carry equal marks.

Attempt any **Three** questions in **section-I**.

Questions IX in **section-II** is **compulsory**.

Section-I

Q-I	A	What are polymers? What is the need to make polymers conductive? Classify conducting polymers.	7
	B	Which are the techniques used to make the polymers conductive? Write the methods of synthesis of conducting polymers.	7
Q-II	A	Explain p-type doping and n-type doping in details and with example.	7
	B	Write in detail about- electrochemistry of electronic conduction in polymers.	7
Q-III	A	Draw the structures and properties of- (i) PANi (ii) Polypyrrol (iii) Polythiophene	7
	B	Write in details the synthesis method and processability of- PANi	7
Q-IV	A	White short note on- (i) Chemical Synthesis (ii) Template synthesis	7
	B	Write advantages and disadvantages of- (i) Chemical Synthesis (ii) Electrochemical Synthesis (iii) Precursor Synthesis	7
Q-V	A	Explain in detail about the technique from which functional groups are identified.	7
	B	Write the differences between SEM and TEM	7
Q-VI	A	Explain in detail about SEM with proper diagram.	7
	B	Explain the electronic transitions taking place in UV visible spectroscopy and derive the applications of UV.	7
Q-VII	A	Write a short note on- Recent trends in conducting polymers.	7
	B	Explain how polymers can be used in- (i) Rechargeable batteries (ii) PCBs (iii) Bio sensors	7
Q-VIII	A	Write a note on- Conducting polymers based on nano composites.	7
	B	What are second generation polymers? Explain in details	7

NO7-2

Section -II

Q-IX	1	Conducting polymers having conjugation is a type of intrinsically conducting polymers. a) True b) False	1
	2	Which of the following is not true for intrinsically conducting polymers? a) Low conductivities b) Poor mechanical strength c) Improcessability d) Good storage stability	1
	3	The advantage of using conducting polymers in place metals is their _____. a) Cost b) Light-weight c) Thermal conductivity d) Solubility	1
	4	Bakelite is _____. a) Gel b) Gas c) Solid d) Liquid	1
	5	Which of the following is used for making rechargeable batteries? a) Polypyrrole b) Polyester c) Polyaniline d) Polyacrylonitrile	1
	6	Which of the following is not an application of conducting polymers? a) Rechargeable batteries b) Analytical sensors c) Electronics d) Adhesives	1
	7	Select the incorrect statement from the following option. a) Conductive element filled polymer possess good bulk conductivity b) Conductive element filled polymer are generally high in cost c) Conductive element filled polymer are light in weight d) Conductive element filled polymer are mechanically durable and strong	1
	8	During the polymerisation of polyaniline, the sequence of the colour change is _____ a) Green >> copper tint >> blue green >> light blue b) Light blue >> blue green >> copper tint >> green c) Copper tint >> blue green >> green >> light blue d) Blue green >> green >> light blue >> copper tint	1

Best of Luck