ACTIVITY CODE: 1903029021

B. Sc. 6th Semester (Honours) Examination, October 2020

Subject: Chemistry

Course ID: 61417 **Course Code: UG/CHEM/604/DSE-4**

Course Title: Polymer Chemistry

Full Marks: 12 **Time: 45 Minutes**

The figures in the margin indicate full marks.
Candidates are required to give their answers in their own words as far as possible

1. Answer *any three* of the following questions: 1×3 = 3

a) Give an example of addition polymer.

b) What is virgin polymer?

c) Give the important IR peaks of Nylon polymer.

d) Draw the structure of polyvinylchloride (PVC).

e) What is the functionality of ethylene glycol in esterification reaction?

f) Expand the abbreviation of PMMA.

g) Draw the structure of isoprene monomer.

h) Give one use of Teflon.

i) Cite an example of natural polymer having industrial application

2. Answer *any one* of the following questions: 5×1 = 5

a) (i) What is meant by co-polymer? Give a brief account of random, alternating and block co-polymers.

(ii) Cite an example of plasticizer. (1+3)+1 = 5

b) Draw the structure of benzoylperoxide and free radical derived from it. Sketch the free radical mechanism of polymerization of ethylene. 2+3 = 5

c) What is number average and weight average molecular weight of polymer? What molecular weight average is obtained with light scattering? In a polymer sample, 50% molecules have molecular weight 80,000 and rest 50% have molecular weight 60,000. Calculate the number average molecular weight of polymer. 2+1+2 = 5

3. Answer *any one* of the following questions: 4×1 = 4

a) Define glass transition temperature (T_g). How it is determined. Write short note on tacticity of polymer. 1+1+2 = 4

b) (i) Arrange the following polymers in increasing order of their intermolecular forces of attraction: Nylon 6, Neoprene, Poly(vinyl chloride).

(ii) Match the polymers given in Column-I with their commercial names given in Column-II.

Column-I	Column-II
(I) Phenol and formaldehyde resin	(A) Teflon
(II) Co-polymer of 1,3-butadiene and styrene	(B) Terelyne
(III) Polyester of ethylene glycol and terephthalic acid	(C) Novolac
(IV) Polymer of tetrafluoroethene	(D) Buna-S

2+2 = 4

c) Give one example of high-performance polymer. How polycarbonate is prepared? Give one of its outstanding properties. 1+2+1 = 4