

M.Sc.(Chem.) Semester - 2 (CBCS) Examination
August/September -2020 [NEW COURSE]
Physical Chemistry (CORE)

Time: 2:00 Hours**Marks: 56****Instructions:**

1. Figure to the right indicate marks.
 2. There are five questions in the question paper.
 3. Answer any four of the following questions.
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Que-1(a) Answer the following: (04)

- (1) Explain vulcanization reaction.
- (2) Explain the reaction of $-\text{NH}_2$ and $-\text{CHO}$ groups with suitable example.

Que-1(b) Answer any two questions out of three. (10)

- (1) Describe block and graft co-polymers.
- (2) Write a note on:
 - i. Classification of polymers.
 - ii. Functionality and polymerization concept for bi-functional and tri-functional compounds
- (3) Explain:
 - i. Stereo regular polymers.
 - ii. Curing reaction.

Que-2(a) Answer the following: (04)

- (1) Explain photochemical polymerisation
- (2) Explain factors affecting free radical polymerisation.

Que-2(b) Answer any two questions out of three. (10)

- (1) Write a note on co-ordination polymerisation.
- (2) Explain chain transfer reaction and derive the Flory – Mayo relation for it.
- (3) Kinetics of anionic and cationic polymerisation.

Que-3(a) Answer the following: (04)

- (1) Discuss the molecular weight control in polycondensation reaction.
- (2) Explain the effect of temperature on direction of polycondensation reaction.

Que-3(b) Answer any two questions out of three. (10)

- (1) Explain factors affecting the rate of polycondensation and molecular weight of the polymers.
- (2) Explain
 - i. Kinetics of polycondensation reaction.
 - ii. Polycondensation equilibrium and molecular weight of polymer.

Que-4(a) Answer the following: (04)

- (1) Define the term: CMC and Micellisation.
- (2) Explain the lyophilic sols with example.

Que-4(b) Answer any two questions out of three. (14)

- (1) Write a note on:
 - i. Surface active agent
 - ii. Electrokinetic potential
- (2) Give a brief explanation about physisorption and chemisorption.
- (3) Derive langmuirs adsorption isotherm.

Que-5(a) Answer the following: (04)

- (1) Explain elimination of liquid junction potential.
- (2) The EMF of the concentration cell is 0.0118 volt at 25°C Temp.

$\text{Pb/PbSO}_4/\text{CuSO}_4$ ($a_{\pm}=0.022$) : CuSO_4 ($a_{\pm}=0.0064$)/ PbSO_4/Pb . Calculate the transference number of Cu^{+2} ion.

Que-5(b) Answer any two questions out of three. (14)

- (1) What are concentration cells? Explain concentration cell without transference.
- (2) Write a short note on
 - i. Ni-Fe accumulator.
 - ii. Decomposition voltage.
- (3) Explain the term overvoltage. What are the application of this phenomenon? Explain hydrogen over potential
