

Total No. of Questions : 12]

SEAT No. :

P1121

[4659]-328

[Total No. of Pages :2

B.E. (Polymer)

**a - APPLIED POLYMER RHEOLOGY
(2008 Course) (Elective - IV) (Semester - II)**

Time : 3Hours]

[Max. Marks :100

Instructions to the candidates:

- 1) *Answer to the two sections should be written in separate answer books.*
- 2) *Answer any three questions from each section.*
- 3) *Neat diagrams must be drawn wherever necessary.*
- 4) *Figures to the right side indicate full marks.*
- 5) *Use of calculator is allowed.*
- 6) *Assume suitable data if necessary.*

SECTION-I

- Q1)** a) Define stress tensor and also strain tensor with one eg.each. [9]
b) Explain uniaxial extension and simple shear in non hookean solids. [9]

OR

- Q2)** a) Give viscosity models for general viscous fluids and explain visco-plastic models. [9]
b) Explain polar decomposition theorem. [9]
- Q3)** a) Explain General linear viscoelastic model. [8]
b) Explain stress relaxation and creep with diagram. [8]

OR

- Q4)** a) Explain non-linear viscoelasticity as well as normal stress difference with egs in shear. [8]
b) Explain shear thinning effect and also shear thickening effect and reason behind it. [8]
- Q5)** a) List different types of rheometers and explain concentric cylinder rheometer. [8]
b) Explain sliding plates and falling ball rheometer in detail. [8]

OR

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- Q6)** a) Explain cone and plate rheometer and derive equation for viscosity. [8]
b) Explain parallel disks rheometer and also explain squeezing flow behaviour. [8]

SECTION-II

- Q7)** a) Write note on : simple extension in Extensional rheometry with egs. and its significance. [9]
b) Write note on: [9]
i) rotating clamps,
ii) buoyancy bath

OR

- Q8)** a) Explain multiaxial extension and fiber spinning with rheology generated. [9]
b) Explain tubeless siphon, bubble collapse, and stagnation flow. [9]
Q9) a) Explain polymer chain conformation, zero shear viscosity. [8]
b) Explain rheology of dilute polymer solutions with egs. [8]

OR

- Q10)** a) Explain Reptation Model and its significance. [8]
b) Give effect of long chain branching and effect of molecular weight distribution on flow properties. [8]
Q11) a) Why rheology is to be known while processing. Explain with egs. [8]
b) Explain rheology developed during Calendaring and two roll mill. [8]

OR

- Q12)** a) Explain rheology developed with Twin screw extruders. [8]
b) Explain rheology developed during Thermoforming as well as in internal mixers. [8]

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