TED (10) 3088 Reg. No. .....

(Revision - 2010) Signature : .....

Third Semester Diploma Examination in Polymer Technology - March, 2012

TECHNOLOGY OF ELASTOMERS

(Maximum Marks : 100) (Time : 3 Hours)

PART – A

(Maximum Marks : 10)

I. Answer the following questions in one or two sentences: Marks

1. What is the role of peptizer in rubber compounding? Give two examples.
2. Write the ISO classification number (ASTM D 1765) for the
   i) SAF ii) HAF iii) GPF iv) ISAF
3. Write any two instruments used to assertain cure characteristics of a rubber compound.
4. List any four products cured by batch vulcanization method other than moulding.
5. Suggest suitable elastomers for
   (i) Pressure cooker gasket (ii) Gasoline hose
   (iii) Automobile inner tube (iv) Truck tyre tread

(5 x 2 = 10)

PART – B

(Maximum Marks : 30)

II. Answer any **five** full questions.

1. a. What are the different cure system used for elastomers?
   b. What are the function of activators and retarders? Give examples.
2. a. How carbon blacks are classified? Give examples.
   b. What are the function of blowing agents, how they classified and give examples.
3. a. Explain the procedure for determining the structure of carbon black.
   b. How antidegradents important in compounding. Give examples.
4. a. What is 'Scorch'? Suggest methods for avoiding scorch.
   b. Write an injection moulding cycle.
5. a. How cure meters are important in a rubber industry?
   b. Draw the flow chart for compression moulding.
6. a. What are the elements to be considered while preparing a rubber product?
   b. Suggest a method to increase hardness without affecting the density of the product.
7. Design a NR based compound having 65 shore A harness using silica as filler.

(5 x 6 = 30)

PART – C

(Maximum Marks : 60)

(Answer one full question from each unit)

UNIT – I

III. a. Write a typical formulation for a soft vulcanized rubber and explain the function of each ingredients. (8)

b. Explain the metal oxide cure system employed for curing of CR. (7)

OR

IV. a. How accelerators are classified? Explain with two examples for each class. (8)

b. Describe CV, EV and semi – EV system. (7)

UNIT – II

V. a. Explain the manufacturing process for the production of furnace type Carbon black with the help of a diagram. [8]

b. Explain how plasticizers are classified with examples. [7]

OR

VI. Briefly explain the following :

a. Non-black fillers

b. ASTMD1765 for grading of carbon black

c. Special purpose additives

[5 x 3 = 15]

UNIT – III

VII. a. Explain with the help of a rheometer, graph, scorchy, delayed action, reversion, plateau, cure rate and cure time. [8]

b. Describe injection moulding process and transfer moulding process. [7]

OR

VIII. a. Describe the cure graph of Mooney viscometer. [5]

b. Explain with the help of neat diagram Rotocure. [5]

c. With the help of a neat diagram, explain the fluidized bed curing. [5]

UNIT – IV

IX. a. Calculate the specific gravity and volume cost of a compound using the given data. [8]

Ingredients	phr	Sp. Gravity	cost/kg.[Rs]
NR	100	0.92	230
Zno	5	5.5	100
Stearic acid	2	0.85	50
Silica	40	1.95	60
Naphthenic Oil	4	0.93	50
A/o SP	1	1.02	150
MBTS	1.2	1.5	140
TMTD	0.2	1.4	180
Sulphur	2.5	2.05	15

b. Explain the effect of particle size and structure of fillers on the processing and vulcanizate properties. [7]

OR

X. a. Chart out the properties of elastomers used in rubber industry. [8]

b. Describe the factors to be considered while compounding for abrasion resistance and flame resistance. [7]

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