17457

21718

3 Hours / 100 Marks Seat No. | | | | | | | | |

Instructions – (1) All Questions are *Compulsory.*

(2) Answer each next main Question on a new page.

(3) Illustrate your answers with neat sketches wherever necessary.

(4) Figures to the right indicate full marks.

(5) Assume suitable data, if necessary.

(6) Use of Non-programmable Electronic Pocket Calculator is permissible.

(7) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. Attempt any FIVE of the following: **20**

a) Define ligament efficiency.

b) What is fatigue concentration?

c) What is design pressure? Explain.

d) Draw a neat sketch of support skirts.

e) Explain the need for multi-shell construction for pressure vessel shell.

f) State design consideration for pressure vessels.

g) What is Poisson's ratio? Define.

h) List two factors to be considered while selecting material for hydrogen service.

Marks

2. Attempt any TWO of the following: **16**

a) Explain the ferrous material for corrosive services used generally in pressure vessel construction.

b) Explain stress concentration due to circular and elliptical opening.

c) Draw a neat sketch of any one type of pressure vessel and explain its terminology.

3. Attempt any FOUR of the following: **16**

a) Explain the importance of conduction visual inspection of welds. List some NDT methods.

b) Suggest a suitable ferrous and non ferrous material used for corrosive service. Explain method of attaching protective layers.

c) State and explain the different stresses included in ring and sphere.

d) Describe any two methods of reducing stress concentration.

e) Describe the nozzle reinforcement process used in fabrication.

f) Write factor governing for:

(i) Double level butt weld

(ii) Fillet weld

4. Attempt any TWO of the following: **16**

a) (i) Classify the nozzles 2

(ii) With neat sketches, illustrate the effect of placement and shape of nozzle on stress concentration. 6

b) Draw neat sketch for flanged joint. Write the stresses acting on its different sections. Classify gaskets giving suitable examples.

c) A cast iron cylinder of inside diameter 150 mm in subjected to a pressure of 13 N/mm^2. The permissible working stress for the cast iron may be taken as 23 MPa. If the cylinder walls, find the thickness of the cylinder wall and the flat head.

Marks

5. Attempt any FOUR of the following: **16**

a) Draw a neat labelled sketch of any one boiler accessory.

b) Explain in brief:

(i) Method of attaching protective layers.

(ii) Use of stainless steel in pressure vessel fabrication.

c) Explain effects of stress concentration in design of pressure vessels.

d) List any four welding defects with their cause.

e) Explain the advantages of using a spherical pressure vessel. Why cylindrical pressure vessel is preffered.

f) Explain membrance stress analysis for torispherical head with neat sketch.

6. Attempt any TWO of the following: **16**

a) (i) Describe the terminology used in pressure vessels.

(ii) Enlist four accessories and mountings of pressure vessels.

b) Ultra high pressure vessel and its design aspects.

c) List the various supports for pressure vessels. Explain skirts support with neat sketches.