16172
4 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.

Marks

1. (A) Answer any THREE : **12**

(a) Draw neat proportionate symbols of Heat Exchanger, Mixing, Centrifugal pump and Rotary vacuum dryer.

(b) Draw instrumentation symbols of temperature control, pressure control, level control and flow control.

(c) Draw neat sketch of any two types of liquid distributor **or** packings.

(d) Draw neat sectional views of Nipple and Socket joint.

(B) Answer any ONE : **8**

(a) Draw specification sheet for a batch reactor.

(b) Draw a neat proportionate drawing of method of fixing tubes on tube sheet and show square and triangular pitch.

OR

Draw a neat proportionate drawing of 1-1 shell and tube heat exchanger with internal configuration and nomenclature.

2. Answer any FOUR : **16**

(a) Draw a neat proportionate drawing of any Jacket with suitable dimensions.

(b) Draw a neat proportionate sketch of a plain face flange.

(c) Draw a neat free hand sketches of any two types of steam pipe supports.

(d) Show by neat proportionate free hand sketch of Gate valve.

(e) Draw neat proportionate sketches of a Expansion joint.

(f) Draw a neat proportionate sectional drawing of gate valve.

3. Answer any FOUR : **16**

(a) Draw any two types of heads used for pressure vessels.

(b) Draw neat proportionate sketches of screwed flanged joint.

(c) Draw a neat sketch of a Globe valve.

(d) Draw a neat sketch of a Ball valve.

(e) Draw a next proportionate sketch of saddle support and Hanger support.

(f) Draw a neat proportionate sketch of a Bracket support for vertical vessels.

4. Read the process and answer the following : **16**

Preheated and compressed Isopropanol (IPA) vapours is sent to a catalytic tubular reactor maintained at 773 ºK. Hot gases from reactor is condensed and scrubbed with water. In the scrubber IPA-acetone mixture is separated from hydrogen gas. The binary mixture is then passed through a fractionating column in which acetone is removed from top and binary mixture of IPA-water is the, fed to another column where IPA is obtained as top product and water as bottom product.

Draw a neat detailed process flow diagram for the process.

5. Answer the following : **16**

(a) Draw the utility line diagram for the process description given in Q. No. 4 above.

(b) Draw the piping and instrumentation diagram of a fractionating column.

6. For the process description given in Q. No. 4 above **16**

(a) Draw a equipment layout diagram for the process.

(b) Draw a tank farm diagram for the above process.
