

THE INSTITUTION OF ENGINEERS, SRI LANKA.

Part I Examination – April 2006

PRESENTATION OF ENGINEERING INFORMATION – PART II

ENGINEERING DRAWING

Date: 01st April 2006.

Time allowed: 4 hours

Read the following instructions before answering the question.

Instructions:

1. *Please read carefully and understand the question before you start answering.*
2. *You are strongly advised to sketch the solution on a blank paper before drawing it on the drawing paper. If you wish, you could attach the sketch to your answer script.*
3. *You are required to draw the standard cage, title block, symbol, etc. Marks will be deducted if the title block is not properly placed.*
4. *All construction details, centerlines etc. should be clearly shown.*

Q1. Figure.1 shows the following components of a "VALVE".

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|-------------------|-------------------------|
| 1. Valve Body. | 8. Lever. |
| 2. Cap Nut. | 9. Plastic Ball Handle. |
| 3. Packing A. | 10. Gland Nut. |
| 4. Packing B. | 11. Packing C. |
| 5. Standard Bolt. | 12. Split Pin |
| 6. Spring. | 13. Pin. |
| 7. Spool. | |

This valve is used to blow carbon dioxide onto the surface of a shell mould in a Foundry. The lower part of the Valve Body (1) is connected by a flexible hose (not shown in the figure) to a carbon dioxide cylinder. Gas is blown onto the surface of the mould through the horizontal outlet when the Spool (7) is depressed by the Lever (8). In the closed position, Spool (7) is firmly held against its conical seat in Valve Body (1) by Spring (6).

Lever (8) is pivoted about Pin (13) which is mounted in the two holes of the upper part of Valve Body (1). Pin (13) is secured in position by the Split Pin (12). The force exerted by the Spring (6) on the Spool (7) can be adjusted by turning the Cap Nut (2) against the Valve Body (1). Gas is prevented from escaping into air through the gap between the stem of Spool (7) and the Valve Body (1) by five numbers of packing C (11), held against the Valve Body by tightening the Gland Nut (10).

In the given application, provision is to be kept for gas to flow through the right hand hole of the Valve Body.

You are required to assemble different components of the Valve in their correct position showing the Valve **FULLY CLOSED**. Note that, Spool (7) is assembled from underside of the Valve Body. Draw the following views of the assembled Valve to full scale in first angle projection.

- Sectional Front Elevation on A - A.
- End Elevation of the Valve projected to the right of the view "a".
- Plan projected from view "a".

Take all casting curves radii as 5 mm. Do not show the hidden details in any of the views of the assembled Valve. Assume any missing dimensions.

You are also required to print the main title "VALVE", sub title, scale, and give a minimum of five main dimensions in the drawing. Also indicate the symbol of projection.

