

DIRECTORATE OF STEAM BOILERS**(MAHARASHTRA STATE)**

(Under Boiler Operation Rules, 2021)

Engineering Drawing

9th March 2024

(TIME : 10-00 A.M. TO 01-00 P.M.)

(Max. Marks—100)

Instructions to candidates :—

- (1) Attempt any *five* questions.
- (2) All questions carry *equal* marks.
- (3) Figures to the right indicate *full* marks.
- (4) Use suitable Scale where required.
- (5) Assume suitably missing data, if any.

	Marks
1. (a) Draw a schematic sketch of a fusible plug.	5
(b) Create proportionate free-hand sketches of the following :—	10
(i) Slip-on raised face flange	
(ii) Steam pipe support	
(iii) Long radius elbow	
(iv) Concentric reducer	
(v) Socket weld elbow.	
(c) Draw process instrumentation symbols of gate valve, globe valve, check valve, control valve and safety valve.	5
2. Figure No. 1 shows a pictorial view of an object. Draw the following views :—	20
(i) Sectional front view	
(ii) Top view	
(iii) Side view from the left	
(iv) Indicate all essential dimensions.	
The arrow indicates the direction to obtain a view from the front.	
3. (a) Name and draw any five types of welding joints.	10
(b) Draw Proportionate free hand sketches of following (any <i>two</i>) :—	10
(1) Cyclone Dust Collector	
(2) Swing Type Non return Valve	
(3) Boiler Feed Water Pump.	

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4. (a) Construct an isometric scale and use it to make a true isometric view of the casting shown in Fig. 2. 10
- (b) Draw with dimensions as mentioned here with for 2:1 Ellipsoidal dished end for steam drum. Take a scale of 1:20
SF: 100 mm, Thickness (t) : 20 mm
OD : 4000 mm, Knuckle radius (KR) = 0.17* ID, Crown radius(CR) = 0.9 *ID
Disc height = ID/4, Total height = SF+ Disc height + t
5. (a) Draw proportionate sketch of a steam stop valve and name the parts. 5
- (b) Draw proportionate sketch of bag filter dust collection system. 5
- (c) Draw a proportionate free hand sketch of drum internals assembly and name the parts 5
- (d) Draw proportionate sketch of plain tube economiser with inlet/outlet headers and name the parts. 5
6. (a) Draw typical schematic general arrangement of coal or bagasse-based steam power plant. Indicate all the essential parts. 10
- (b) Draw the P-ID of water treatment plant for high pressure boilers from pre-treatment to D.M. Water. 5
- (c) Draw neat and proportionate sketch of any *one* of following :— 5
- (1) Bourdon type Pressure Gauge
 - (2) Spring Loaded Safety Valve
 - (3) Inverted Bucket type steam trap.

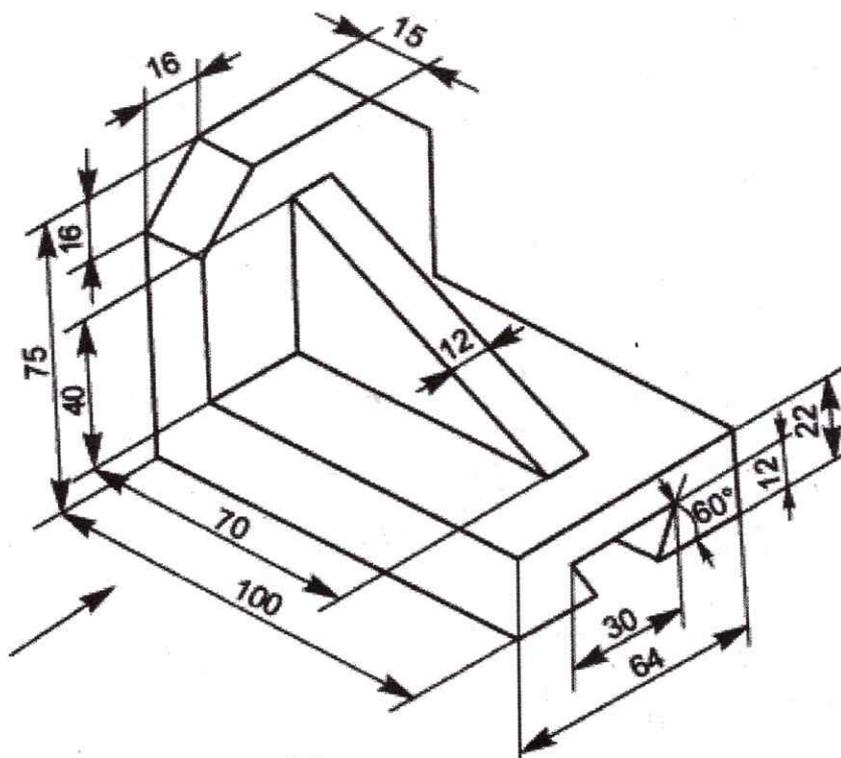
Fig. No. 1

Fig. No. 2

