



UNIVERSITY OF RUHUNA

Faculty of Engineering

End-Semester 4 Examination in Engineering: November 2022

Module Number: MN4303

**Module Name: Marine Engineering Computer Aided
Drawing**

[Three Hours]

[Answer all parts of the question, the question carries 100 marks].

Instructions to Candidates:

- This question paper contains one question and 04 pages including this page
- Answer all parts of the question
- Marks allocated for each part of the question have been indicated.
- The drawing should be in accordance with B.S.308:1993 and hidden details should be omitted.
- Select the ISO A2 sheet for drawing all views and other details.
- The scale selected must ensure uniform distribution and coverage of the drawing sheet.
- Write your **Index Number, the Module Code and the Title of the paper** in the specified space of the drawing sheet.
- Save the soft copy of your drawing in AutoCAD 2016 or lower version giving your Index Number and the Module Code (Eg. EG_2021_XXXX MN4303)

Q1 Figure Q1 shows details of an **Air Inlet Valve**. The descriptions of the valve are given below;

- The $\text{Ø}60$ Valve stem fits in the $\text{Ø}65$ central hole in the valve body, and mitre on the valve head locates in a similar mitre on the seat shown enlarged in a local section.
- The valve guide takes a form of a piston fitted with three rings which works in a cylinder $\text{Ø}110$ cast on the top of the body.
- A recess is turned in the valve stem near the end and a split collar $\text{Ø}75 \times 19$ deep is fitted in this recess and bears on a shoulder inside the piston.
- The outside diameter of the piston is increased from $\text{Ø}110$ to $\text{Ø}130$ and the shoulder thus formed bears on a split spherical ring. This ring in turn is located in the spring keep plate which bears on the ends of both springs. Two springs are used, one wound to a right hand helix and the other to a left hand helix. (Opposite hand springs are used so that in the event of a spring breaking the broken spring cannot interfere with the intact spring).
- The piston rings which prevents air leakage are not detailed in the pictorial view but this could be shown in the grooves in the piston.
- For lubrication of the piston eight holes of $\text{Ø}2$ are drilled at an angle at the bottom of a 5×5 groove turned in the top face of the housing and four drained holes of $\text{Ø}4$ are drilled at the bottom of the cylinder.

a) Draw the following view of the valve assembly in First Angle Projection

(i) Front elevation of the assembled valve in section with inlet branch on the left. The section plane should be through the right hand holding down stud hole.

[40 Marks]

(ii) End elevation

[25 Marks]

(iii) Plan view

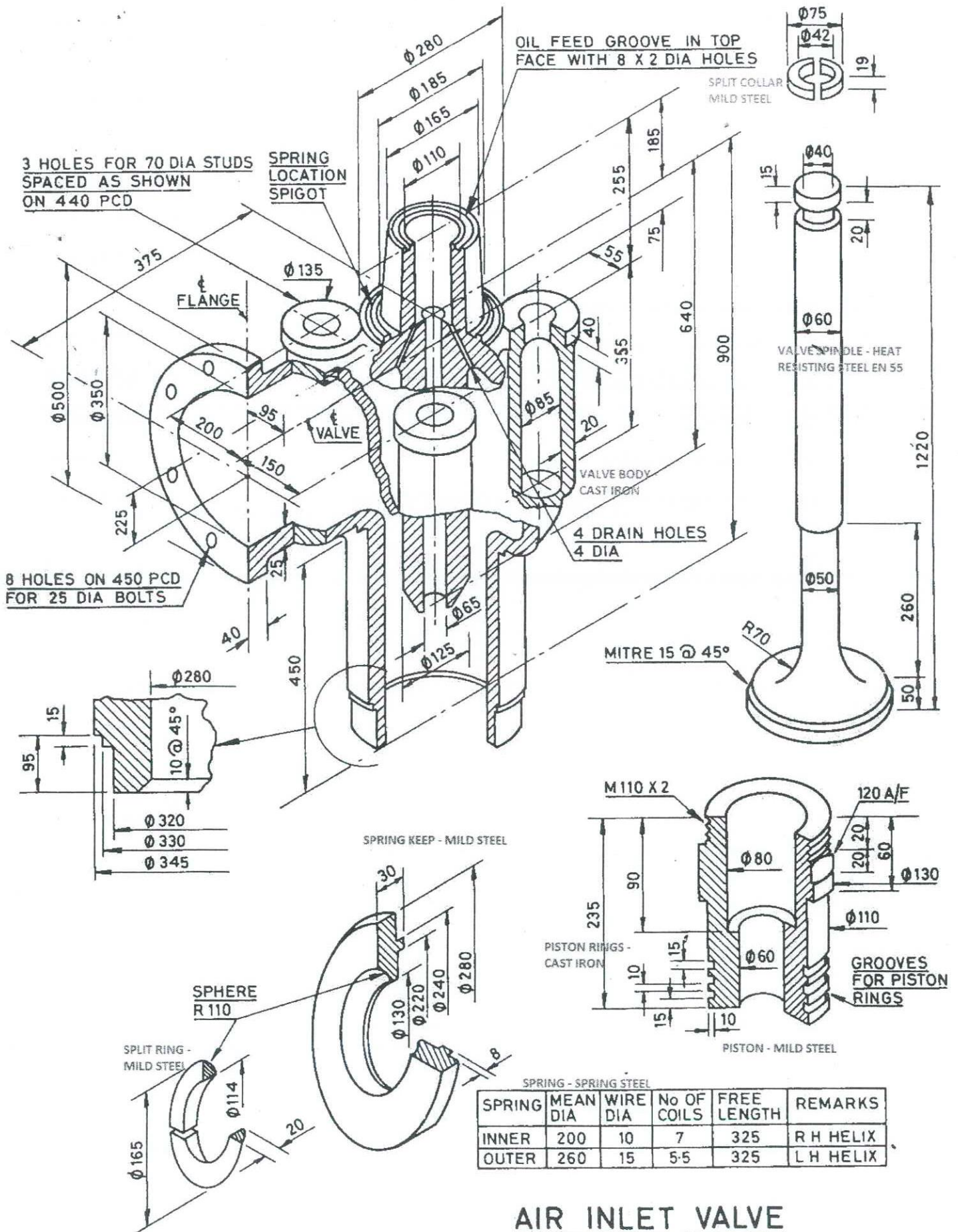
[20 Marks]

b) Complete the drawing by adding the following,

i) A parts list, with the parts clearly identified on the assembled drawing.

- [02 Marks]
- ii) Title and Subtitles
- [01 Marks]
- iii) The projection symbol
- [01 Marks]
- iv) All dimensions
- [03 Marks]
- c) Electronic drawing values
- i) Select a suitable standard paper for the drawing [01 Marks]
- ii) Use suitable Layers [03 Marks]
- iii) Text styles [01 Marks]
- iv) Dimension styles [02 Marks]
- v) Use standard text heights for dimensions and texts [01 Marks]

Note: Assume any missing dimensions.



SPRING	MEAN DIA	WIRE DIA	No OF COILS	FREE LENGTH	REMARKS
INNER	200	10	7	325	R H HELIX
OUTER	260	15	5.5	325	L H HELIX

AIR INLET VALVE