CBCS SCHEME

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18EE643

Sixth Semester B.E. Degree Examination July/August 2022
(ELECTRICAL & ELECTRONICS ENGINEERING)

COMPUTER AIDED ELECTRICAL DRAWING

Time: 3 Hrs   Max. Marks: 100

Instruction:

1. Answer Question 1 <u>or</u> 2 <u>and</u> 3 from PART-A

2. Answer Question 4 <u>or</u> 5 from PART-B

3. Use of CAD tool that satisfies that requirement of the syllabus is permitted. Suitable data may be assumed if not given.

Part A

1. Draw the armature winding of a DC machine with 4 poles, 14 slots, double layer progressive lap winding. Show on the developed winding diagram, the poles, polarity of poles, direction of rotation of the armature, direction of Emf induced/current in the conductors, sequence diagram, and position & polarity of brushes.   **(25 Marks)**

OR

2. Draw the developed winding diagram of an AC machine having the following details. Speed = 3000rpm No of slots = 24   Frequency =50 Hz   No. of Phase =3 Phase spread: 60^0 Phase sequence: RYB
    Type of Winding = double layer, lap short pitched by 1 slot connected in star.   **(25 Marks)**

3. Draw the single line diagram using ISI symbols, for a 110kV / 11kV MUSS with the following data:
    110kV incoming lines, Two
    Line OCB's 110 kV, Two
    Transformer 110kV/11kV, Two
    L.T OCB's for transformer, Two
    Duplicate bus bars on H.T & L.T sides
    Bus coupler on H.T side only
    Feeders 11 kV, Six
    L.T circuit breaker for feeders, Six
    Earthing switch at incoming lines, Two
    Wave trap at incoming lines, Two
    Coupling condenser (C.C) at incoming lines, Two station supply transformer 11kV/415kV.
    Show the positions of CT, PT, Isolating Switches, Lightning arrestors, circuit breakers   **(25 Marks)**

PART B

4. Draw the following views of a 3 phase, core type, 250kVA, 11kV/400V transformer:

    Front elevation right half in section

    Plan right half in section

    Dimensions of core and winding details are given below:

    Core: 3 stepped

        Diameter of circumscribing circle = 24 cm

        Distance between adjacent core centers = 42.5 cm

        Height of the yoke = 25 cm

        Total height of the transformer = 100 cm

    LV winding: Outer diameter of LV coil = 28.3 cm

        Inner diameter of LV coil = 25 cm

        Height of LV winding = 43.5 cm

        Number of turns per phase = 12

    HV winding: Outer diameter of HV coil = 41.5 cm

        Inner diameter of HV coil = 34.3 cm

        Height of HV winding = 43.5 cm

    Number of turns per phase = 572   **(50 Marks)**

OR

5. Following are the details of a main pole of a DC machine. Draw to suitable scale

    a) Elevation with right half in section

    b) Plan with right half in section

    Number of poles- 4

    Height of pole-140mm

    Width of the pole-127mm

    Length of the pole -170mm

    Armature diameter-400mm

    Pole arc/ pole pitch =0.67

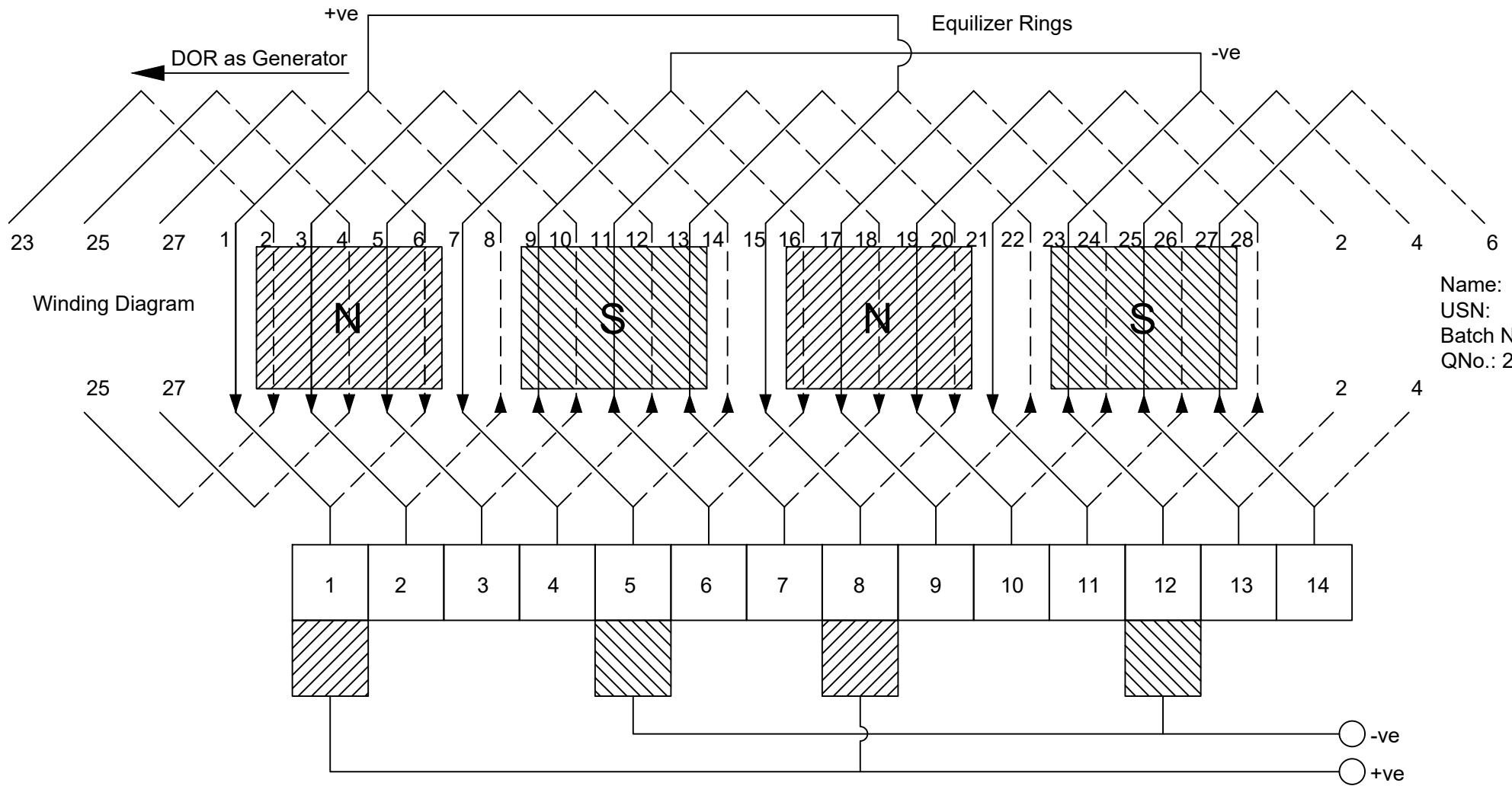   Number of turns per pole -1890

    Conductor area -1.77mm2

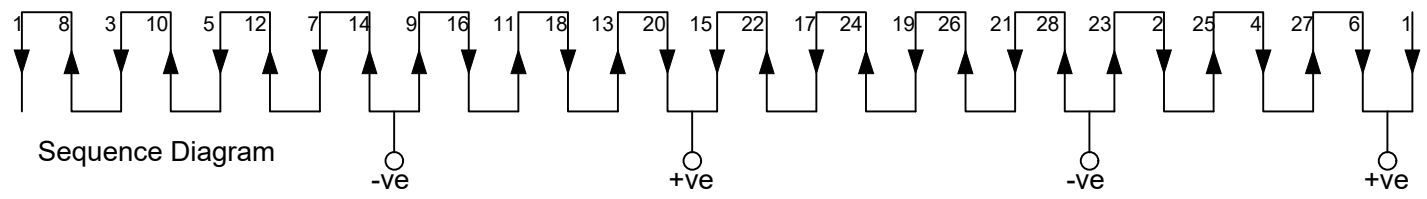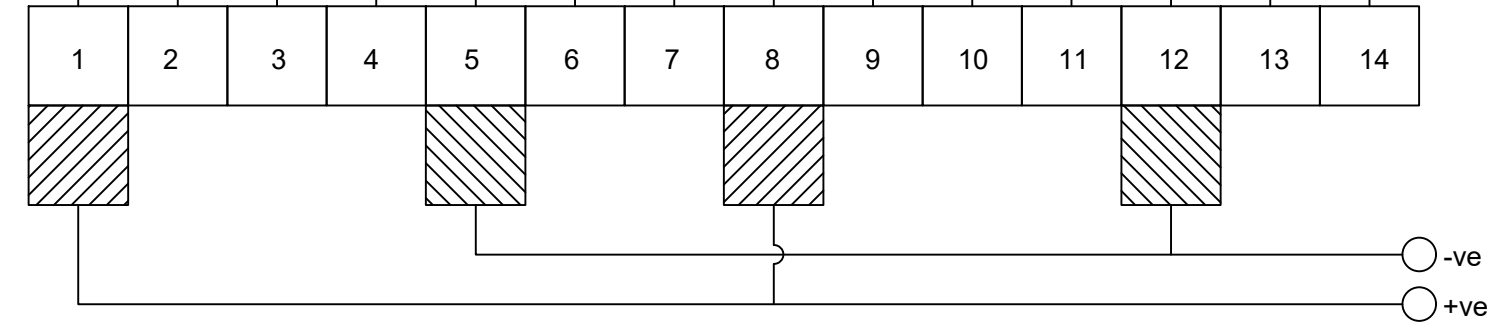   Depth of the winding-45mm

    Height of the winding-110mm

    (Missing data may be proportionally assumed)   **(50 Marks)**

* * * * *

DOR as Generator

Equilizer Rings

+ve   -ve

Winding Diagram

23 25 27 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 2 4 6

N   S   N   S

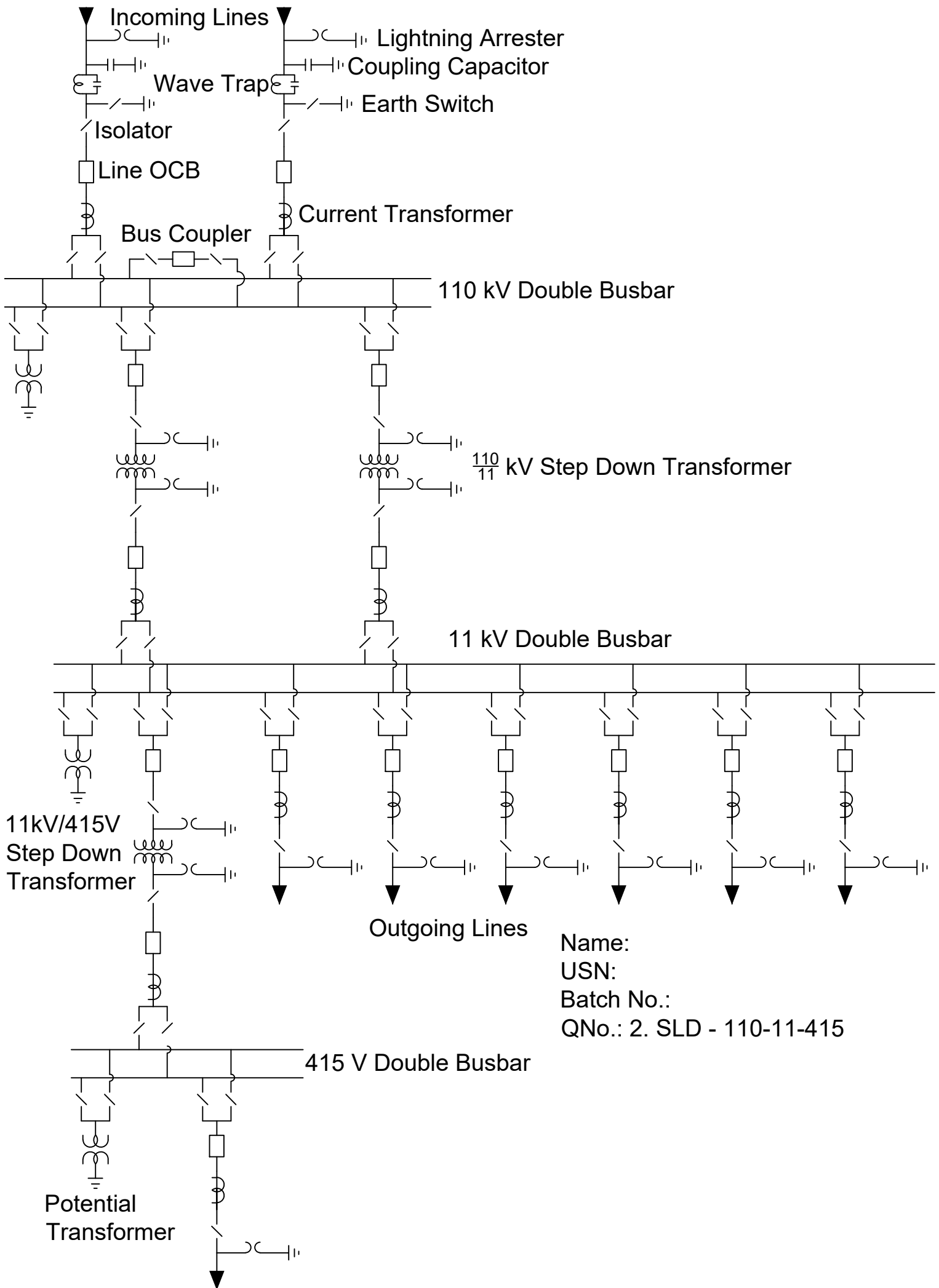25 27   2 4

Name:
USN:
Batch No.:
QNo.: 2. DCW - DLSPL

1	2	3	4	5	6	7	8	9	10	11	12	13	14

-ve

+ve

1 8 3 10 5 12 7 14 9 16 11 18 13 20 15 22 17 24 19 26 21 28 23 2 25 4 27 6 1

Sequence Diagram

-ve   +ve   -ve   +ve

Incoming Lines
Lightning Arrester
Coupling Capacitor
Wave Trap
Earth Switch
Isolator
Line OCB
Current Transformer
Bus Coupler

110 kV Double Busbar

$\frac{110}{11}$ kV Step Down Transformer

11 kV Double Busbar

11kV/415V Step Down Transformer

Outgoing Lines

415 V Double Busbar

Potential Transformer

Name:
USN:
Batch No.:
QNo.: 2. SLD - 110-11-415

Sectional Elevation Scale: 1:1

106.60000

25.00000

20.90000

5.81879

36.00000

36.25000

0.76050

100.00000 50.00000 43.50000

16.50000
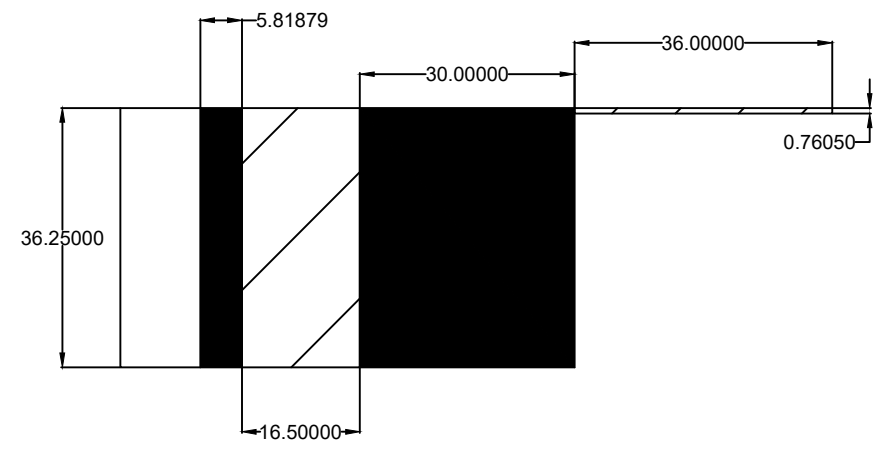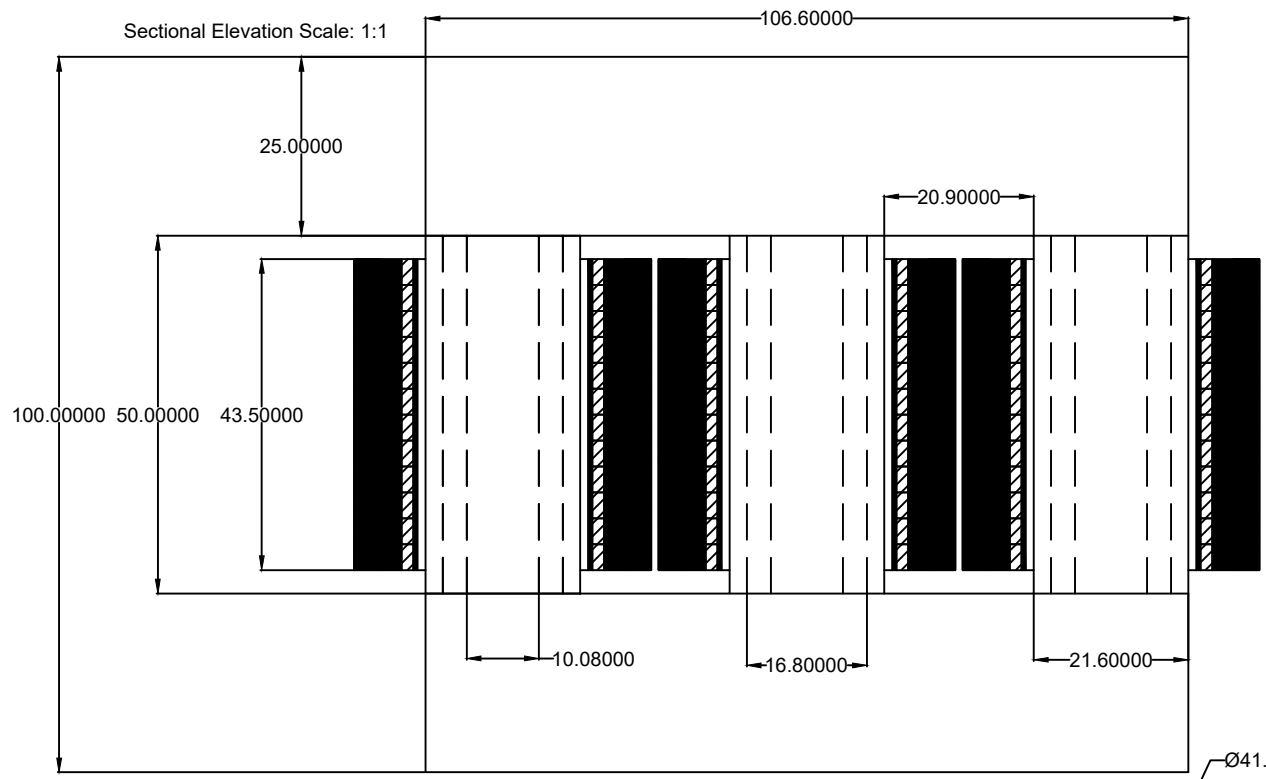
Arrangement of LV and HV Coil Scale: 1:10
Shown one turn each of LV out 12 turns and HV out of 572 turns

10.08000

16.80000

21.60000

Sectional Plan
Scale: 1:1

42.50000

42.50000

Ø41.50000

Ø34.30000

Ø28.30000

Ø25.00000

Ø23.83624

21.60000 16.80000 10.08000
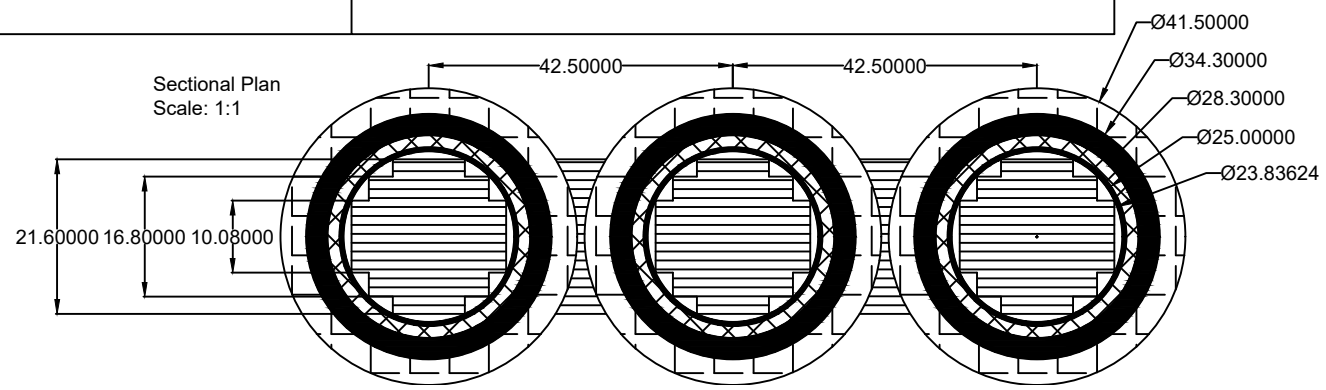
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