CMR INSTITUTE OF TECHNOLOGY

USN | 1 | C | R | 1 | | E | E | | | |

Internal Assesment Test – 2

Sub: Computer Aided Electrical Drawing (Professional Elective)					Code: 15EE651
Date: 17/04/2018	Duration: 90 mins	Max Marks: 50	Sem: 6	Section: A [EEE]	Batch: A1

Answer ANY One question from **Q1**. **Q2** is compulsory. Explain your notations explicitly and clearly. Sketch figures wherever necessary. Use AutoCAD Software for drawing. Good luck!

		Marks	OBE	
			CO	RBT
Q1a.	Develop an ac lap winding diagram for the following details: Number of phases = 3; Number of poles = 4; Number of slots = 21; Double layer; and Phase sequence = RYB.	[20]	CO651.2	L3
	OR			
Q1b.	Develop an ac winding diagram for the following data: Number of slots = 24; Number of poles = 4; Number of phases = 3; and RYB phase sequence with bifurcated 2-tier winding.	[20]	CO651.2	L3
Q2.	Draw the sectional elevation and plan of a 1-phase, 125 kVA, shell type transformer for the following data: **Magnetic Core**: Width of the central limb = 140 mm; Overall height of the core = 380 mm; Overall width of the core = 540 mm; Overall depth of the core = 370 mm; and Window dimension = 130 mm x 240 mm. **Winding**: 4 HV coils and 4 LV coils placed alternatively. **Rectangular Coil Dimension**: Inside dimension = 150 mm x 410 mm; Outside dimension = 350 mm x 570 mm; Thickness = 20 mm; and Insulation between the coils = 10 mm.	[30]	CO651.4	L3

CMR INSTITUTE OF TECHNOLOGY

USN | 1 | C | R | 1 | | E | E | | | |

Internal Assesment Test – 2

Sub: Computer Aided Electrical Drawing (Professional Elective)					Code: 15EE651
Date: 17/04/2018	Duration: 90 mins	Max Marks: 50	Sem: 6	Section: A [EEE]	Batch: A2

Answer ANY One question from **Q1**. **Q2** is compulsory. Explain your notations explicitly and clearly. Sketch figures wherever necessary. Use AutoCAD Software for drawing. Good luck!

		Marks	OBE	
			CO	RBT
Q1a.	Draw the developed winding diagram of an ac machine having the following details: Number of phases = 3; Number of poles = 4; Number of slots = 24; Single layer; and Unbifurcated 3-tier winding with RYB phase sequence.	[20]	CO651.2	L3
	OR			
Q1b.	Develop an ac wave winding diagram for the following data: Number of slots = 24; Number of poles = 4; and Number of phases = 3. The coils are short pitched by one slot.	[20]	CO651.2	L3
Q2.	Draw the right half sectional plan and elevation of a 1-phase, 15 kVA, 50 Hz, core type distribution transformer having the following details: **Magnetic Circuit**: Cross section of the core = 63 mm x 91.6 mm; Window = 298.5 mm x 114.5 mm; and Yoke height = 63.5 mm. **Details of LV Winding**: Number of coils/leg = 1; Number of turns/coil = 72; Number of layers = 3; and Cross section of the conductor = 2.79 mm x 10.6 mm. **Details of HV Winding**: Number of coils/leg = 1; Number of turns/coil = 720; Number of layers = 8; and Diameter of the conductor = 2.59 mm. **Insulation**: Between core and LT = 1.6 mm; Between LT and HT = 3 mm; On top and bottom winding = 0.35 mm; and Between layers = 0.35 mm.	[30]	CO651.4	L3

ASSIGNMENT # 02.

Name : L. krishna priya.
Usn : 1CR15EE038.
Class : 6A , EEE.
Subject : CAED

1a. Develop an ac lap winding diagram for the following details :
No. of ph = 3 ; P = 4 ; S = 21 ; DL ; Phase sequence - RYB.

$S/p = \frac{21}{4} = 5.24$

$m = S/p/ph = \frac{5.24}{3} = 1.75$

∴ fractional slot winding

$S/p = \frac{21}{4}$ not reducible further.

$\frac{21}{3} = 7$

poles	R (1–7)	B (8–14)	Y (15–21)
P_1	1 5	9 13	17 21
P_2	4	8 12	16 20
P_3	3 7	11	15 19
P_4	2 6	10 14	18

	P_1	P_2	P_3	P_4
TCS	222	122	212	221
BCS	221	222	122	212

TCS RRYYBB | RYYBB | RRYBB | RRYYB
BCS R'R'Y'Y'B'R' | R'Y'Y'B'B' | R'Y'Y'B'B' | R'R'Y'B'B'
P_1 P_2 P_3 P_4

$\beta = \frac{180^\circ}{S/p} = \frac{180 \times 4}{21} = \frac{720}{21}$

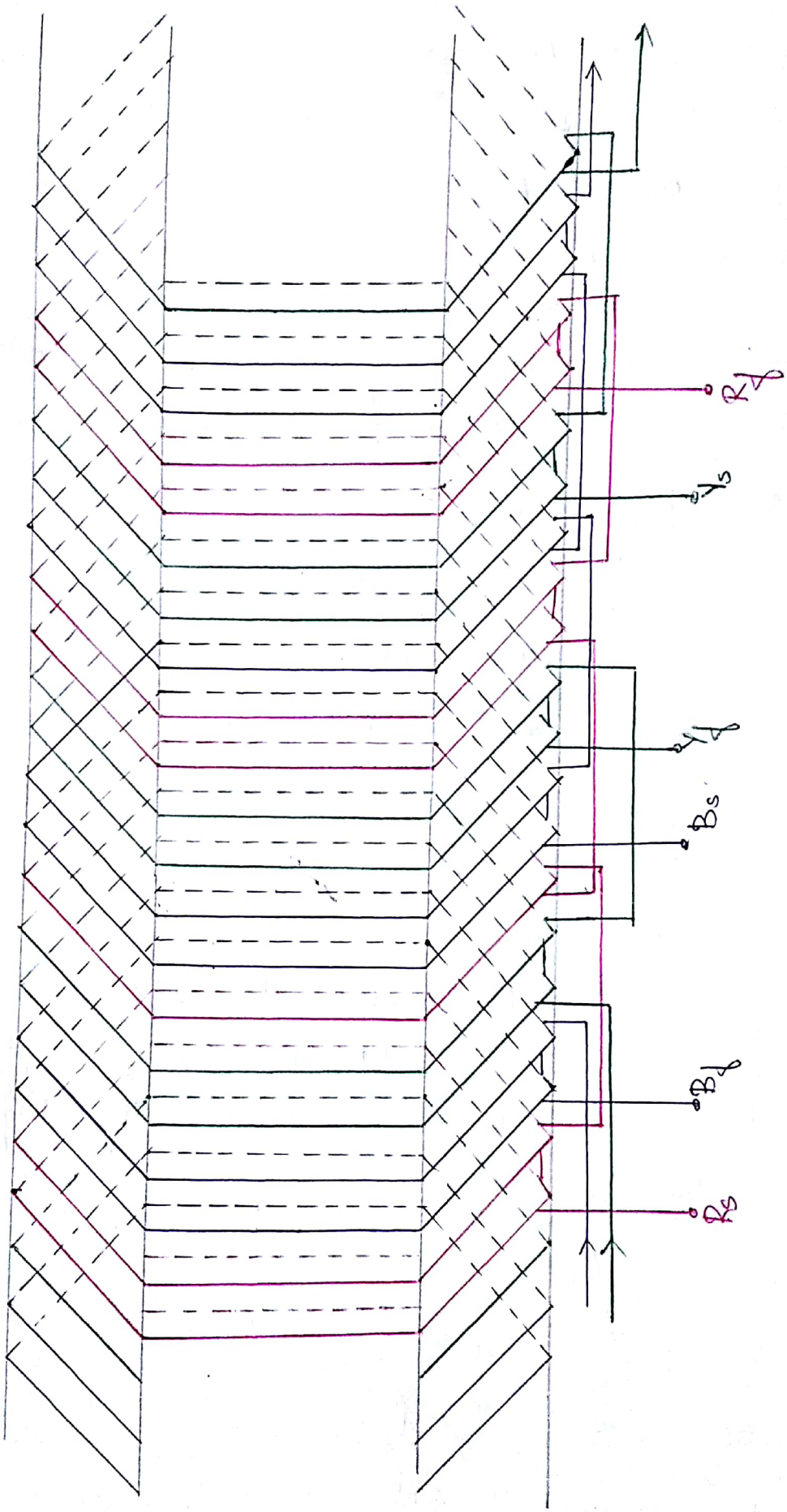
$R_{st} = 1^{st}$ slot.

$Y_{st} = 1 + \frac{120}{\beta} = 4.5$

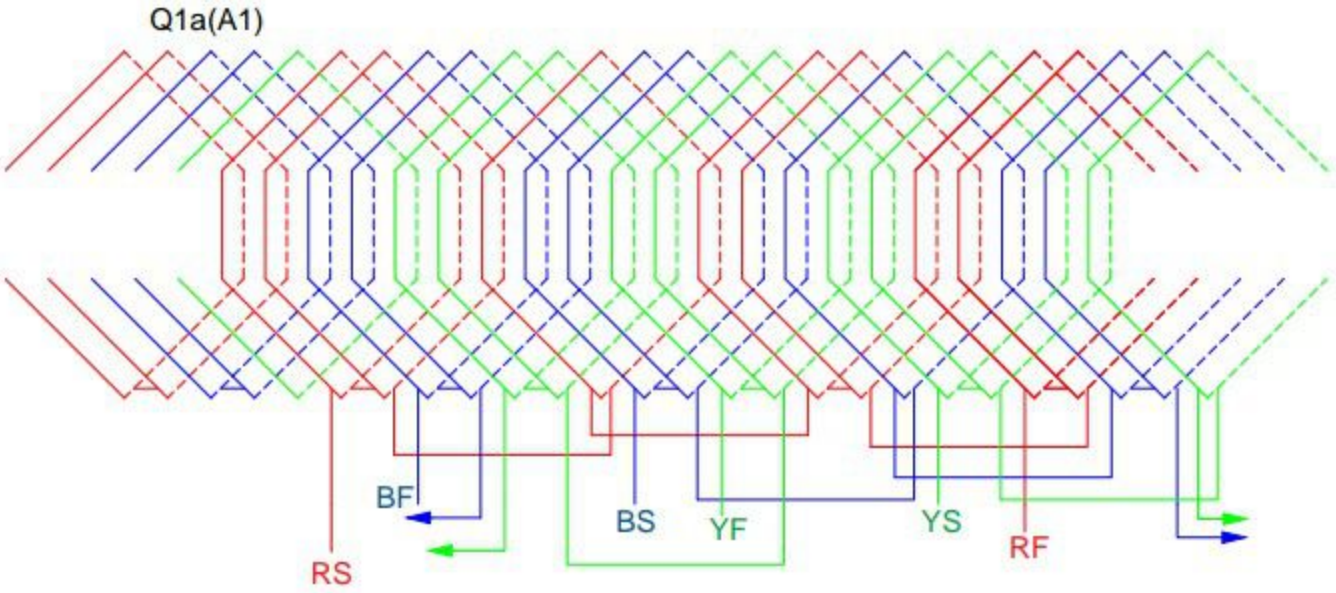
$Y_{st} = 1 + \frac{480}{\beta} = 15^{th}$ slot.

$B_{st} = 1 + \frac{240}{\beta} = 8^{th}$ slot.

Scanned by CamScanner



Scanned by CamScanner


Q1a(A1)
BF
BS
YF
YS
RF
RS

Q1.b. Develop an ac winding diagram for the following data: $S = 24$; $P = 4$; $\phi = 3$; RYB phase sequence with bifurcated 2-1 winding.

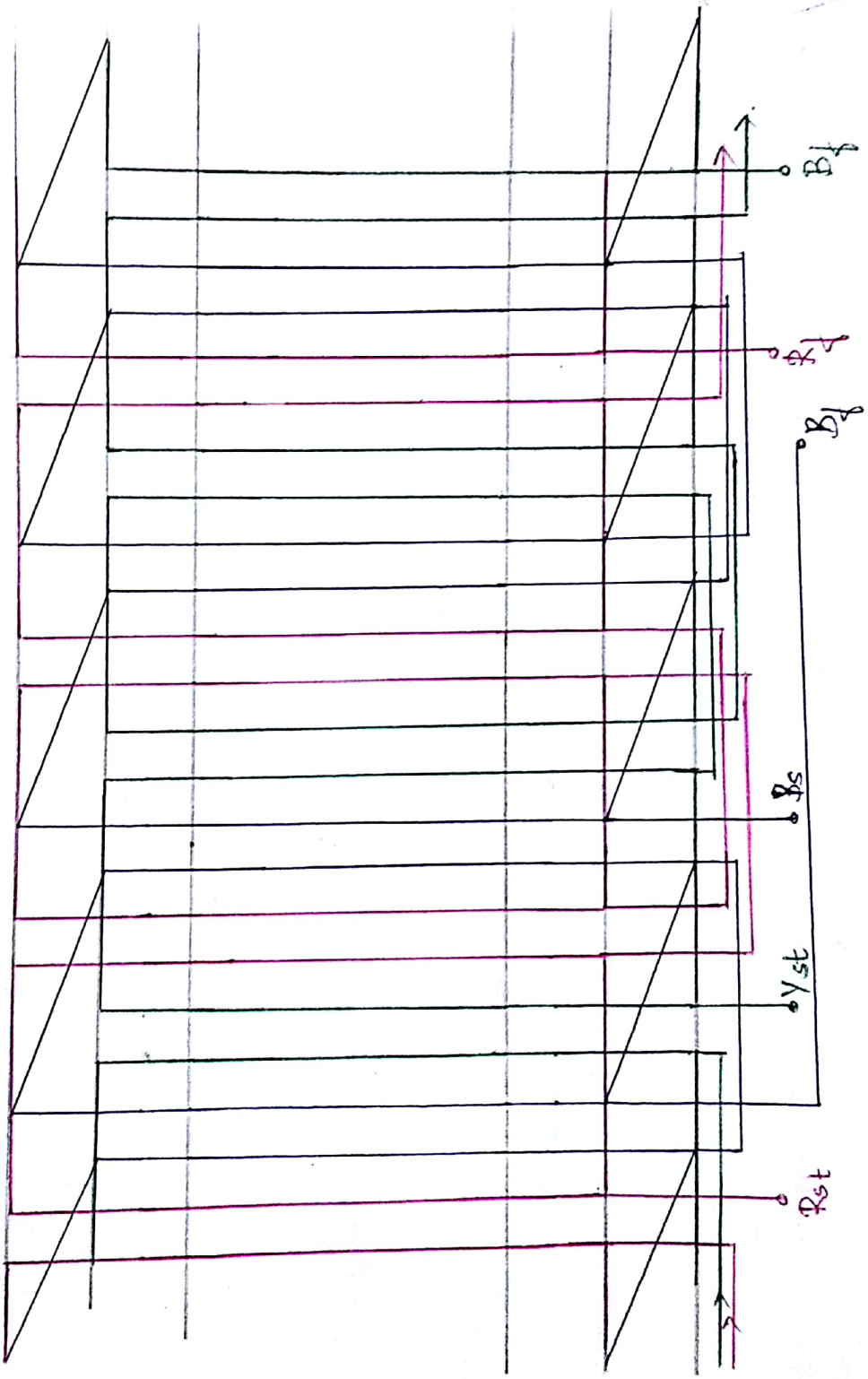
Sol:

WT RRBBYY | RRBBYY | RRBBYY | RRBBYY

R_{st} - 1st

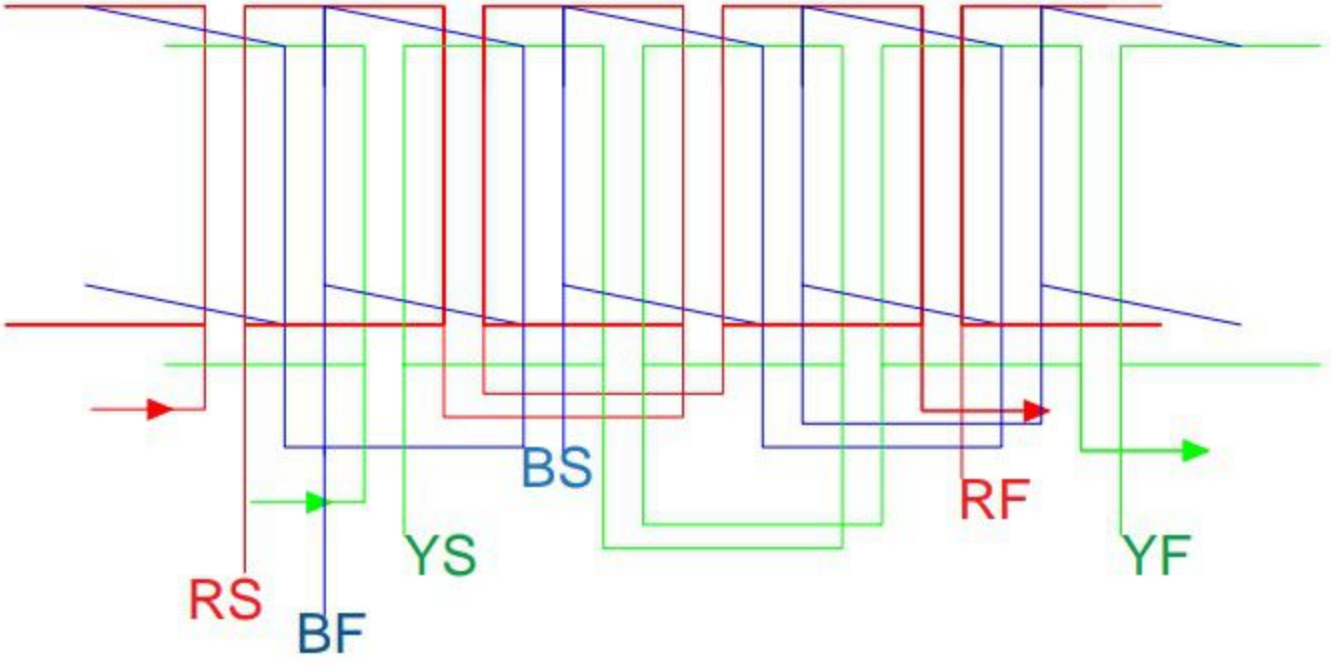
Y_{st} - 5th

B_{st} - Cranked 9th

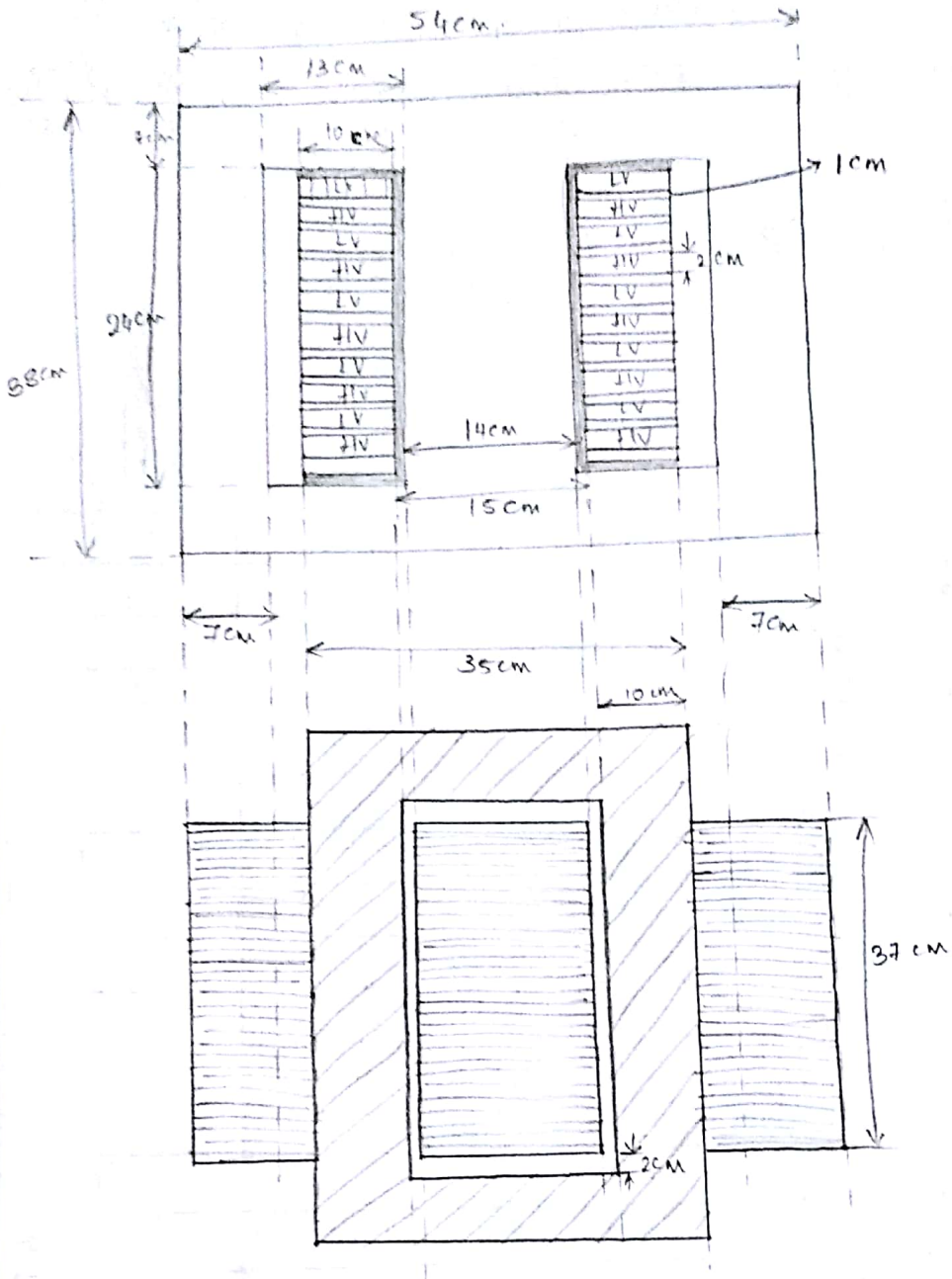


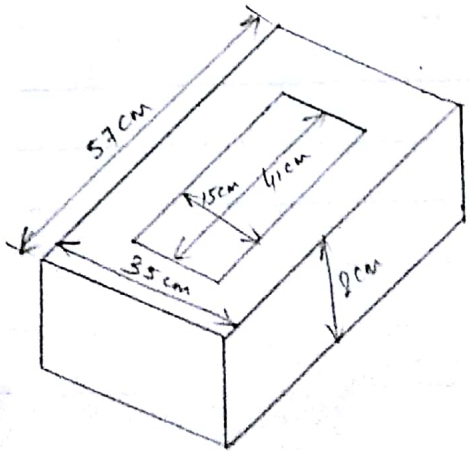
Scanned by CamScanner

Q1(b)



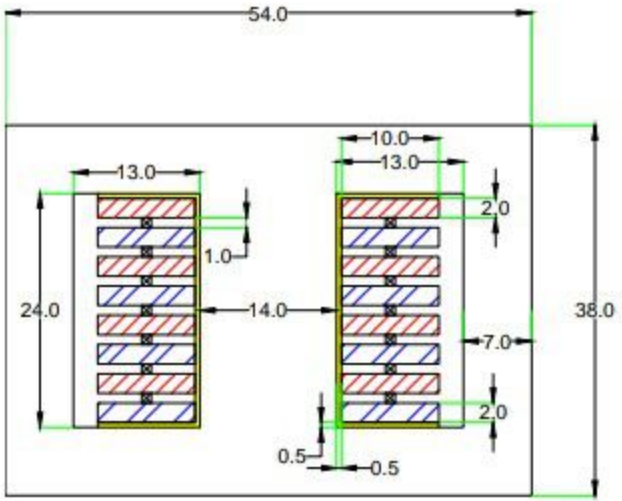
Q2

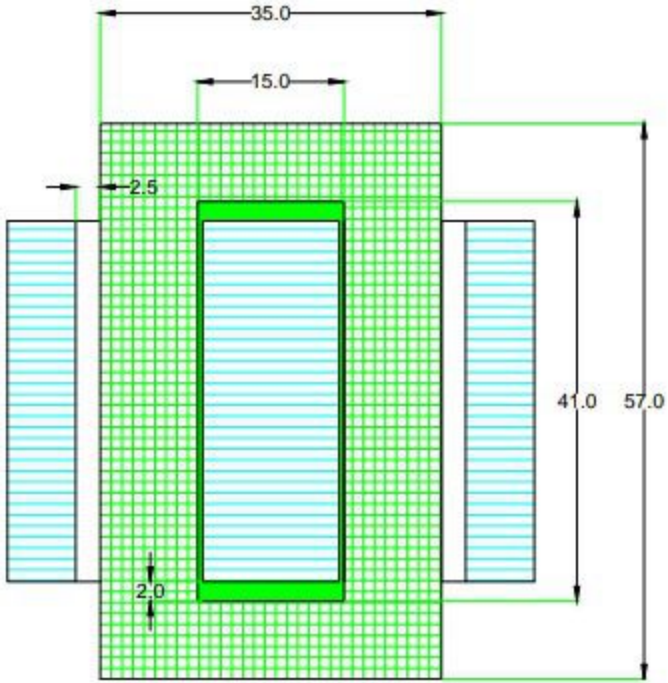




Scanned by CamScanner

Q2(A1)





Q1 a. S = 24, P = 4, 3ϕ, SL; RYB, 2T

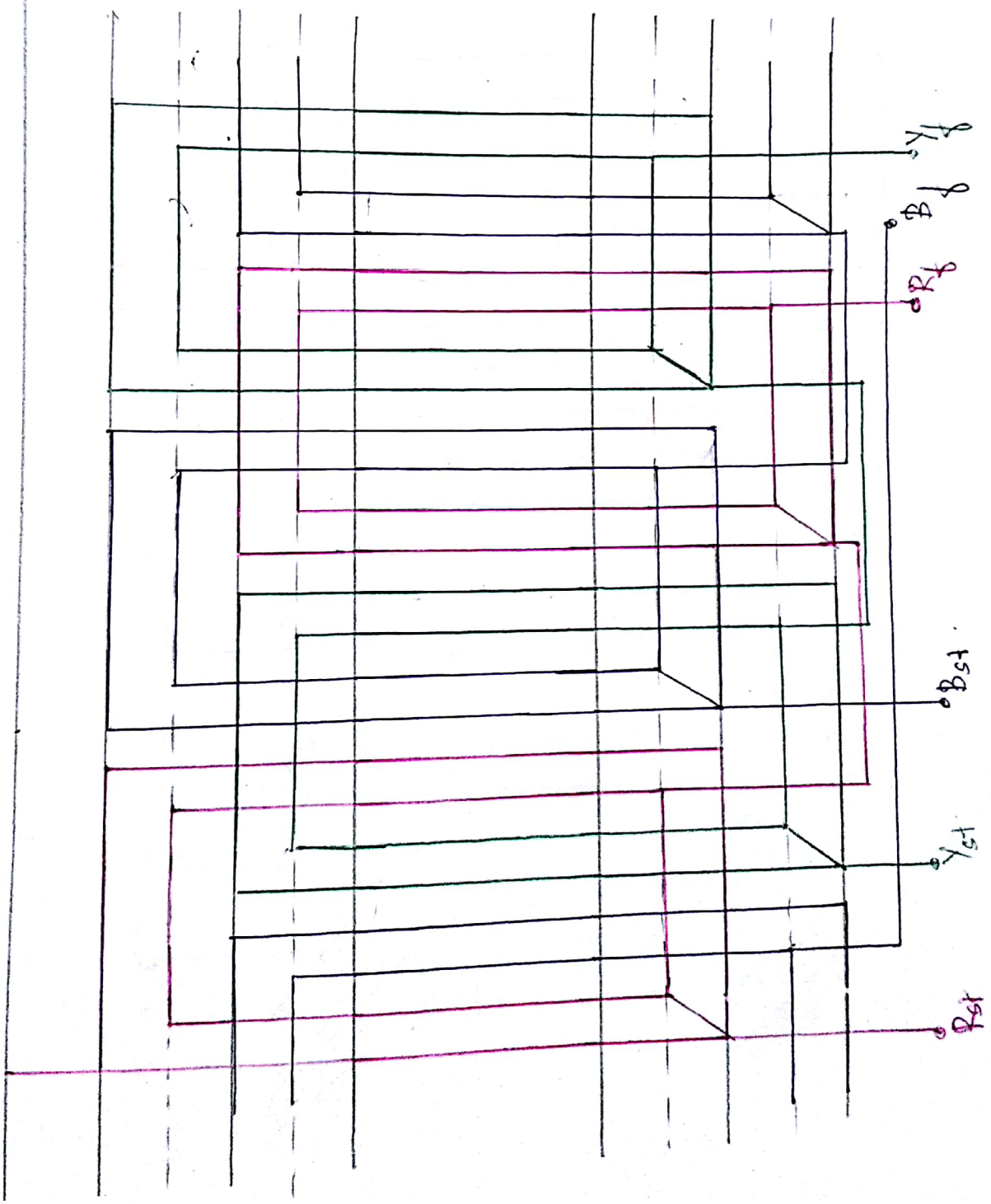
Sol $S/P = \frac{24}{4} = 6$; $m = 6/3 = 2$

$\beta = \frac{180}{S/P} = 30$; $R_{st} = 1^{st}$ $Y_{st} = 1 + \frac{120}{\beta} = 5^{th}$, $B_{st} = 1 + \frac{240}{\beta} = 9^{th}$

$CG = 3\phi = 3 \times 2 = 6$. $GG/T = 6/2 = 3$

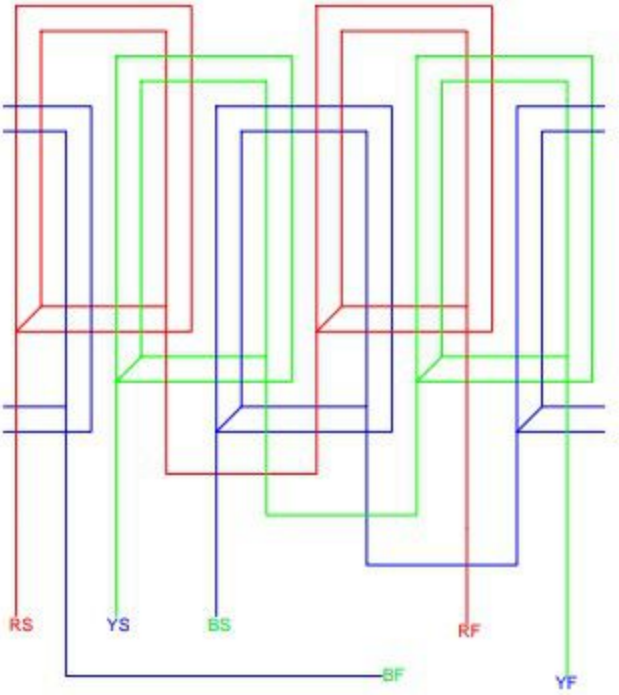
RYB RYB
1 2 1 2 1 2.

WT: RRBBYY RRBBYY RRBBYY RRBBYY.



Scanned by CamScanner

Q1a(A2)

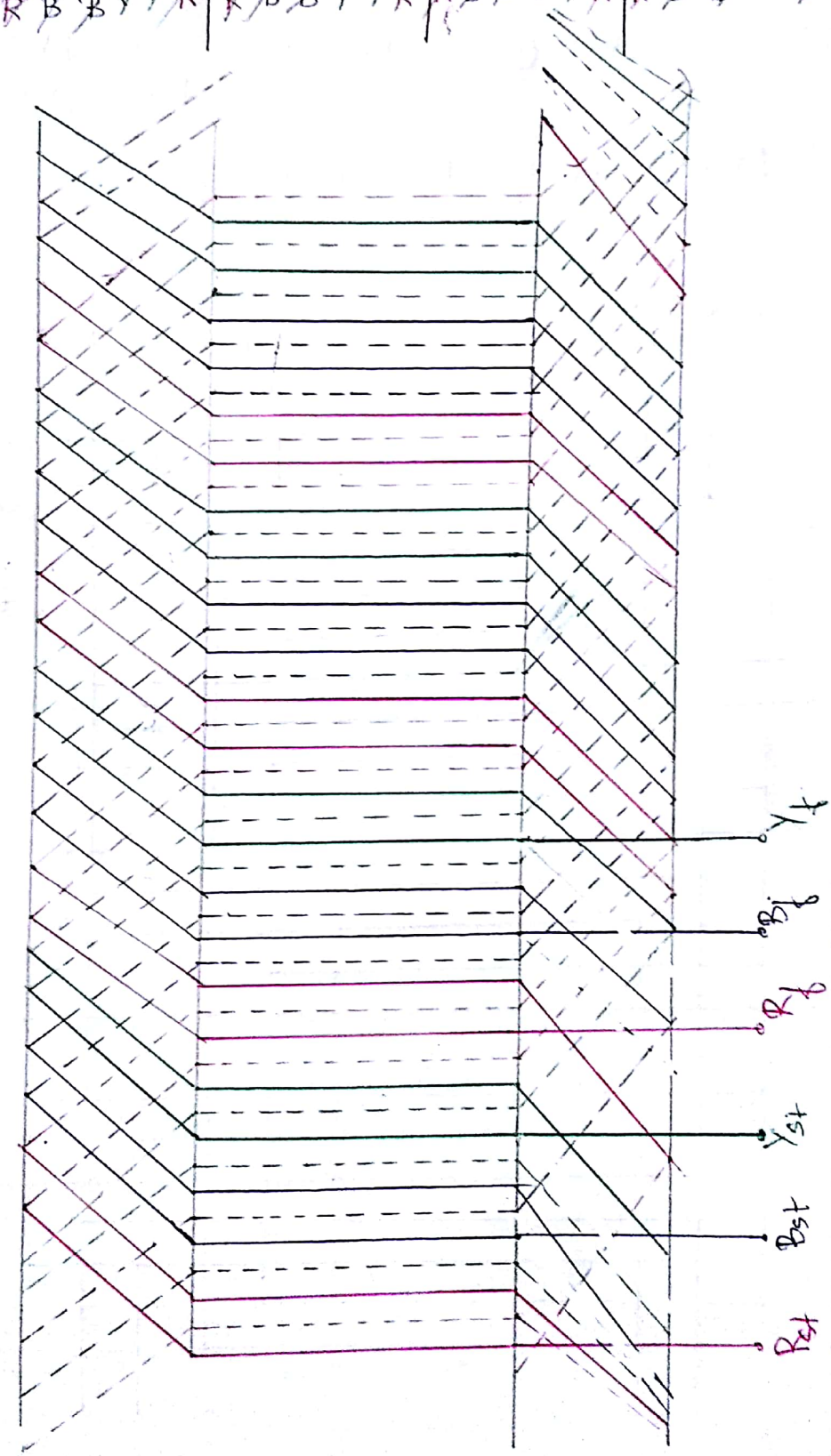


Q1.b $S = 24$; $P = 4$; $\phi = 3$; Wave, short pitched by 1 coil.

$S/P = \frac{24}{4} = 6$; $S/P/ph = 6/3 = 2$.

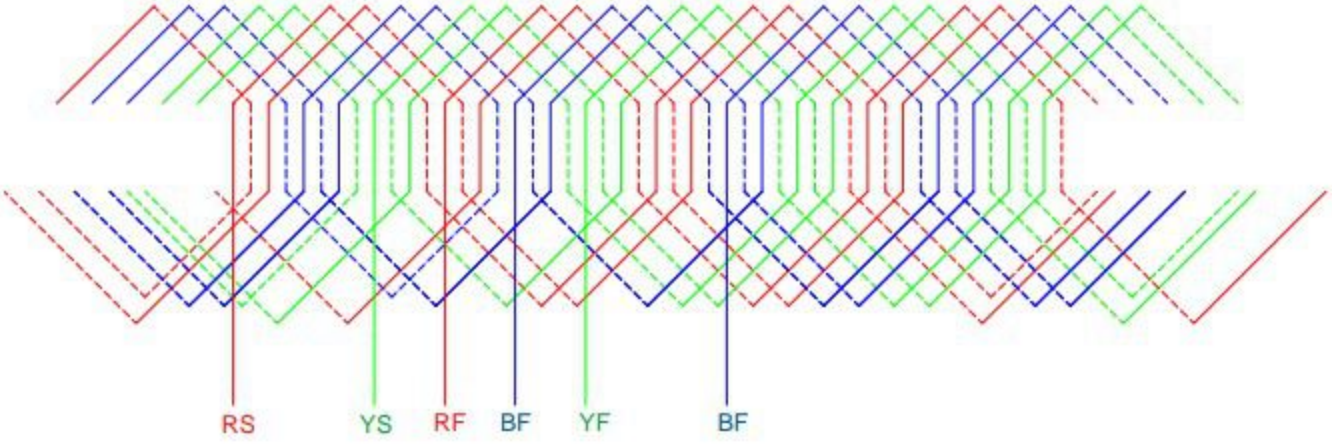
TCS R R B B Y Y | R R B B Y Y | R R B B Y Y | R R B B Y Y

BCS R' B' B' Y' Y' R' | R' B' B' Y' Y' R' | R' B' B' Y' Y' R' | R' B' B' Y' Y' R'



Scanned by CamScanner

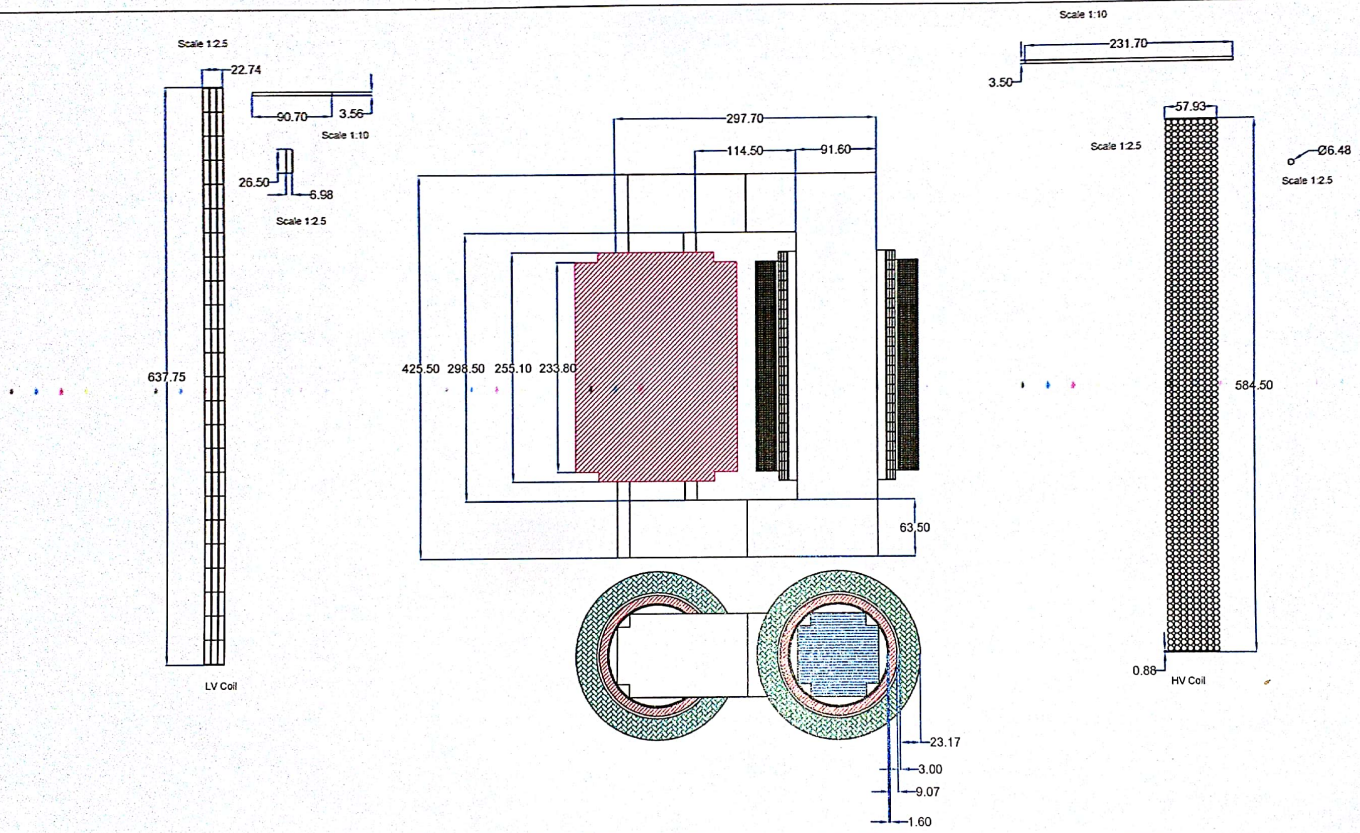
Q1(b)



(7)

Scanned by CamScanner

Drawing Title



Name: Mahesh HC	USN: 1CR15EE046	Section: a	Dwg No.: 1
Date: Apr 13, 2018 - 12:39pm	Scale: 1:1	Sheet: 1 of: 3	Marks:

Scanned by CamScanner