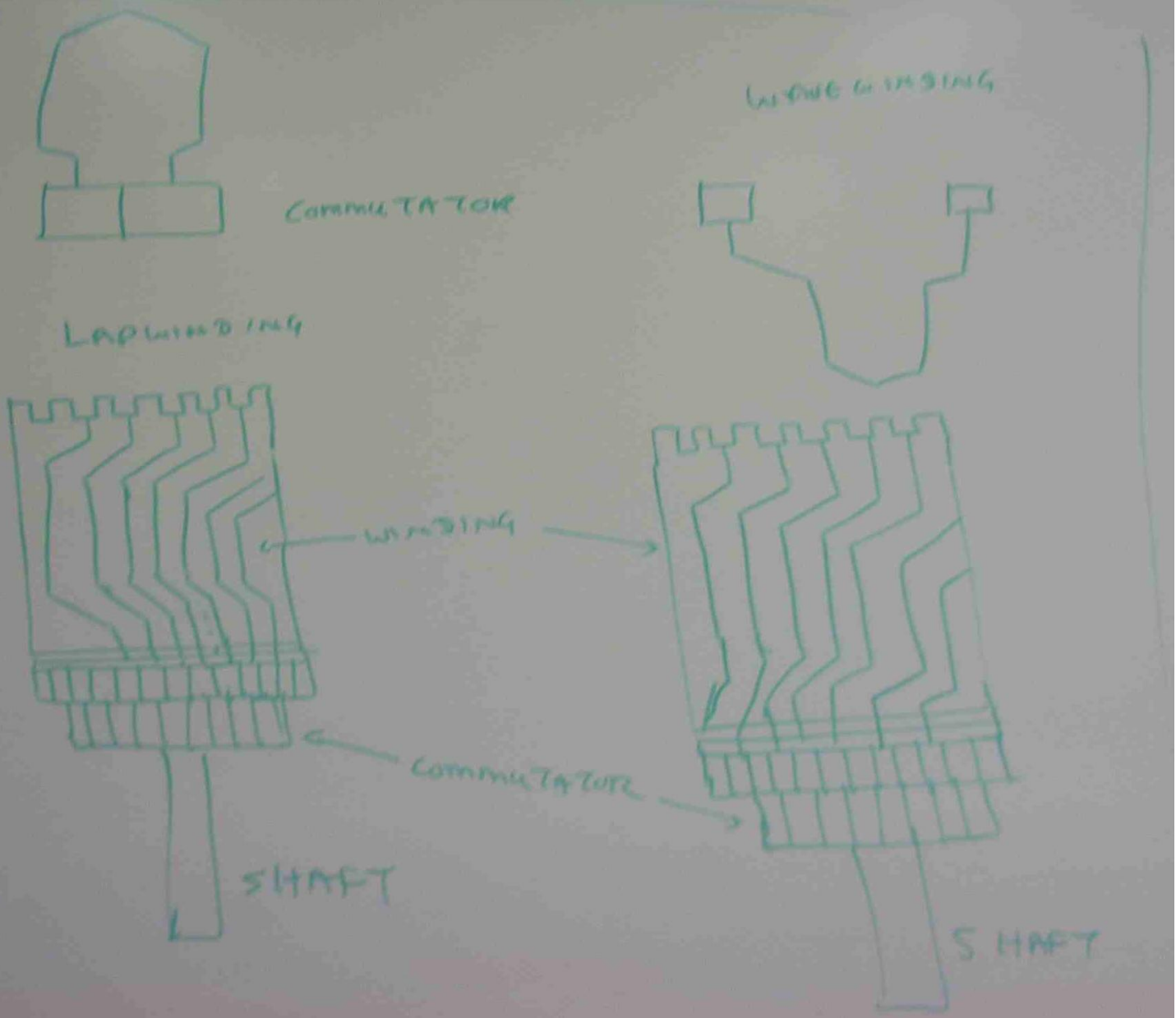
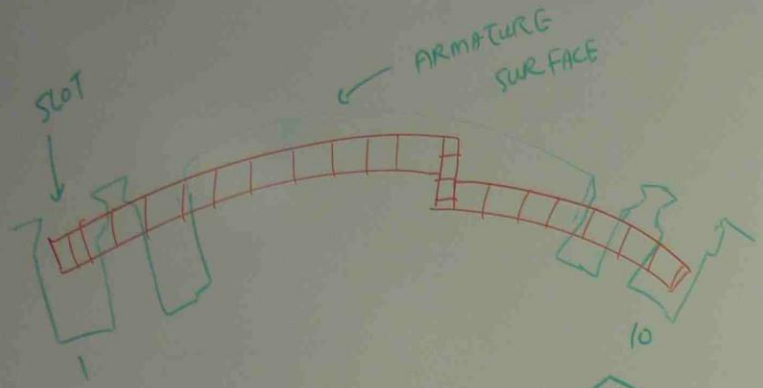
GOAL

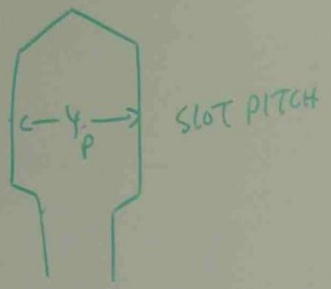
Types of DC ARMATURE WINDINGS





COIL PITCH

$$Y_p = \frac{S}{P} \pm k$$



S = NO. OF SLOTS

P = NO. OF POLES

k = A FRACTION THAT IS EITHER ADDED TO OR SUBSTRACTED FROM $\frac{S}{P}$ TO MAKE Y_p TO BE INTEGER

Pb CALCULATE THE COIL PITCH Y_p AND INDICATE THE SLOT NUMBERS IN WHICH THE FIRST COIL IS WOUND FOR EACH OF THE FOLLOWING CASES ASSUMING THAT THE DETAILS REFER TO A 4 POLE MACHINE.

(a) S = 35 (b) S = 36 (c) S = 37 (d) S = 42

(a) $Y_p = \frac{S}{P} = \frac{35}{4} = 8\frac{1}{4} - \frac{1}{4} = 8$ SLOT 1 → 9

(b) $Y_p = \frac{S}{P} = \frac{36}{4} = 9$ SLOT 1 → 10

(c) $Y_p = \frac{S}{P} = \frac{37}{4} = 9\frac{1}{4} - \frac{1}{4} = 9$ SLOT 1 → 10

(d) $Y_p = \frac{S}{P} = \frac{42}{4} = 10\frac{1}{2} - \frac{1}{2} = 10$ SLOT 1 → 11

P1)

REPEAT THE ABOVE EXAMPLE FOR THE FOLLOWING CASES ASSUMING THAT IN EACH INSTANCE THE DATA REFERS TO A 6 POLE MACHINE.

(a) $S = 72$ (b) $S = 37$ (c) $S = 77$

(a) $Y = \frac{S}{P} = \frac{72}{6} = 12$

$1 \longrightarrow 13$

(b) $Y = \frac{S}{P} = \frac{37}{6}$

$= 6\frac{1}{6} - \frac{1}{6} = 6$

$1 \longrightarrow 7$

(c) $Y = \frac{S}{P} = \frac{77}{6}$

$12 \cdot \frac{5}{6} - \frac{5}{6}$

12

PROGRESSIVE AND RETROGRESSIVE WINDINGS

Y_c = COMMUTATOR PITCH = +1 FOR SIMPLEX LAP PROGRESSIVE WINDING

Y_c = COMMUTATOR PITCH = −1 FOR SIMPLEX LAP RETROGRESSIVE WINDING

WAVE WINDING

IN SIMPLEX WAVE WINDING, THE CIRCUIT RETURNS TO A SEGMENT ADJACENT TO THE STARTING SEGMENT AFTER TRANSVERSING $\frac{P}{2}$ COILS

$$Y_C = \frac{C \pm m}{P/2}$$

C = NO OF COMMUTATOR SEGMENT

m = 1 FOR SIMPLEX WAVE
2 FOR DUPLEX WAVE

\+ PROGRESSIVE
\- RETROGRESSIVE

P = NO. OF POLES.

b) FIND THE COMMUTATOR PITCH OF THE FOLLOWING WINDINGS 4 POLES

(a) 35 SLOTS, SIMPLEX WAVE PROGRESSIVE
(b) 35 SLOTS SIMPLEX WAVE RETROGRESSIVE
(c) 34 SLOTS DUPLEX WAVE PROGRESSIVE
(d) 34 SLOTS DUPLEX WAVE RETROGRESSIVE

(a) $Y_C = \frac{C \pm m}{P/2} = \frac{35+1}{4/2} = \frac{36}{2} = 18$ $1 \rightarrow 19$

(b) $Y_C = \frac{C \pm m}{P/2} = \frac{35-1}{4/2} = \frac{34}{2} = 17$ $1 \rightarrow 18$

(c) $Y_C = \frac{C \pm m}{P/2} = \frac{34+2}{4/2} = \frac{36}{2} = 18$ $1 \rightarrow 19$

(a) $\frac{34-}{4}$

$\frac{32}{}$