

Unit 12 - Week 9

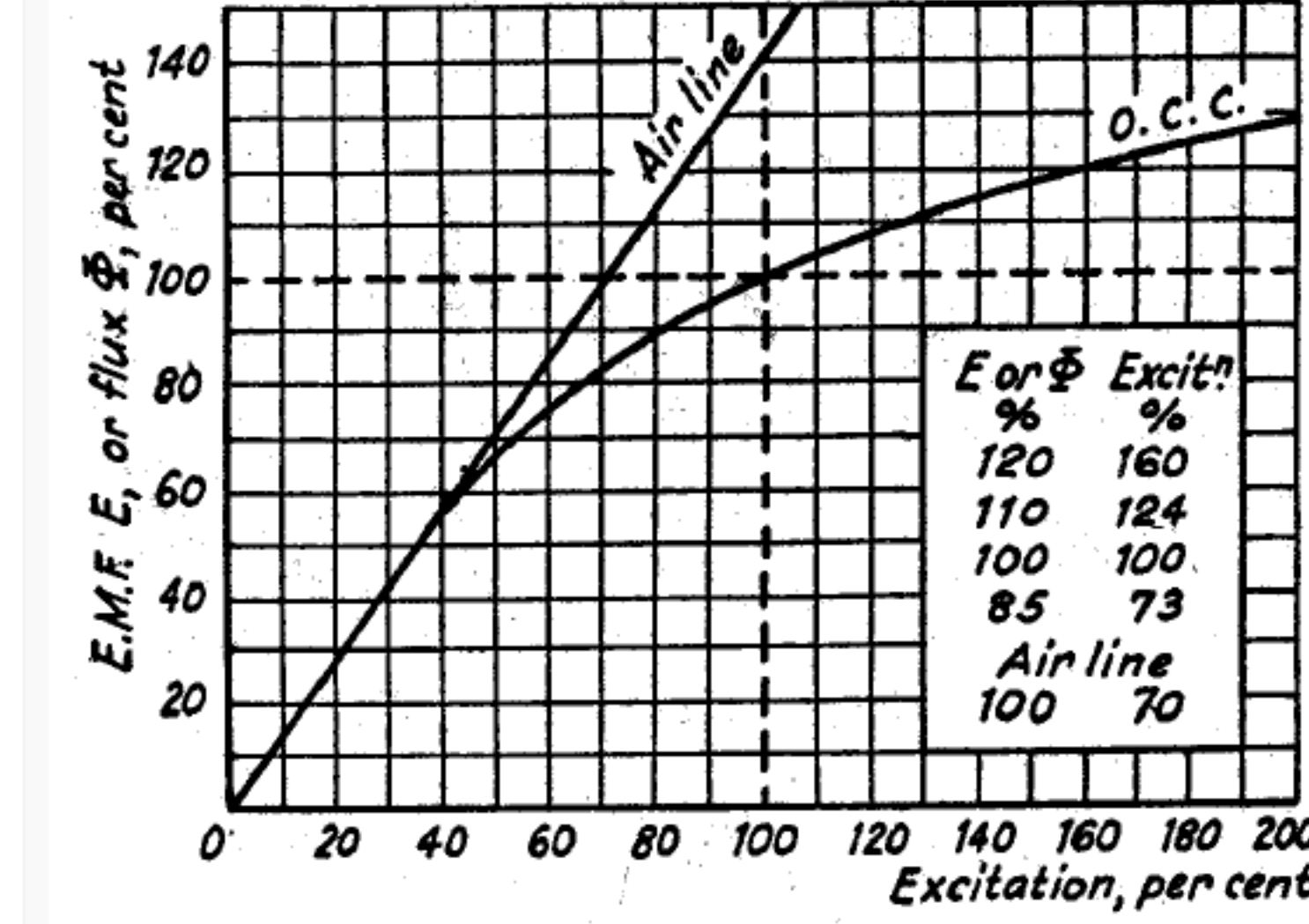
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Week 9 Assignment 9

The due date for submitting this assignment has passed. As per our records you have not submitted this assignment.

Due on 2019-10-02, 23:59 IST.

Common data for Question 1 to 5



Saturation or magnetization curve or open-circuit characteristic for a generator or motor.

The open-circuit characteristic of a shunt generator running at 850 r.p.m. is as given in the figure, where 100% represents an induced electromotive force of 100V and a field current of 4A. (Hint: You may solve the following problems graphically)

1) Find the open circuit voltage (in V) of the machine with a field resistance of 22 Ω .
 a. Around 80 V
 b. Around 90 V
 c. Around 110 V
 d. Around 130 V
 e. None of the above

- a.
- b.
- c.
- d.
- e.

No, the answer is incorrect. Score: 0 Accepted Answers: c.

2) Find the open circuit voltage (in V) of the machine with a field resistance of 30 Ω .
 a. Around 63 V
 b. Around 81 V
 c. Around 99 V
 d. Around 117 V
 e. None of the above

- a.
- b.
- c.
- d.
- e.

No, the answer is incorrect. Score: 0 Accepted Answers: b.

3) Find the field resistance R_f (in Ω) for normal voltage (100% or 100 V) at normal speed (850 r.p.m.).
 a. Around 5 Ω
 b. Around 15 Ω
 c. Around 25 Ω
 d. Around 35 Ω
 e. None of the above

- a.
- b.
- c.
- d.
- e.

No, the answer is incorrect. Score: 0 Accepted Answers: c.

4) Find the critical resistance (in Ω) at normal speed
 a. Around 36 Ω
 b. Around 46 Ω
 c. Around 56 Ω
 d. Around 66 Ω
 e. None of the above

- a.
- b.
- c.
- d.
- e.

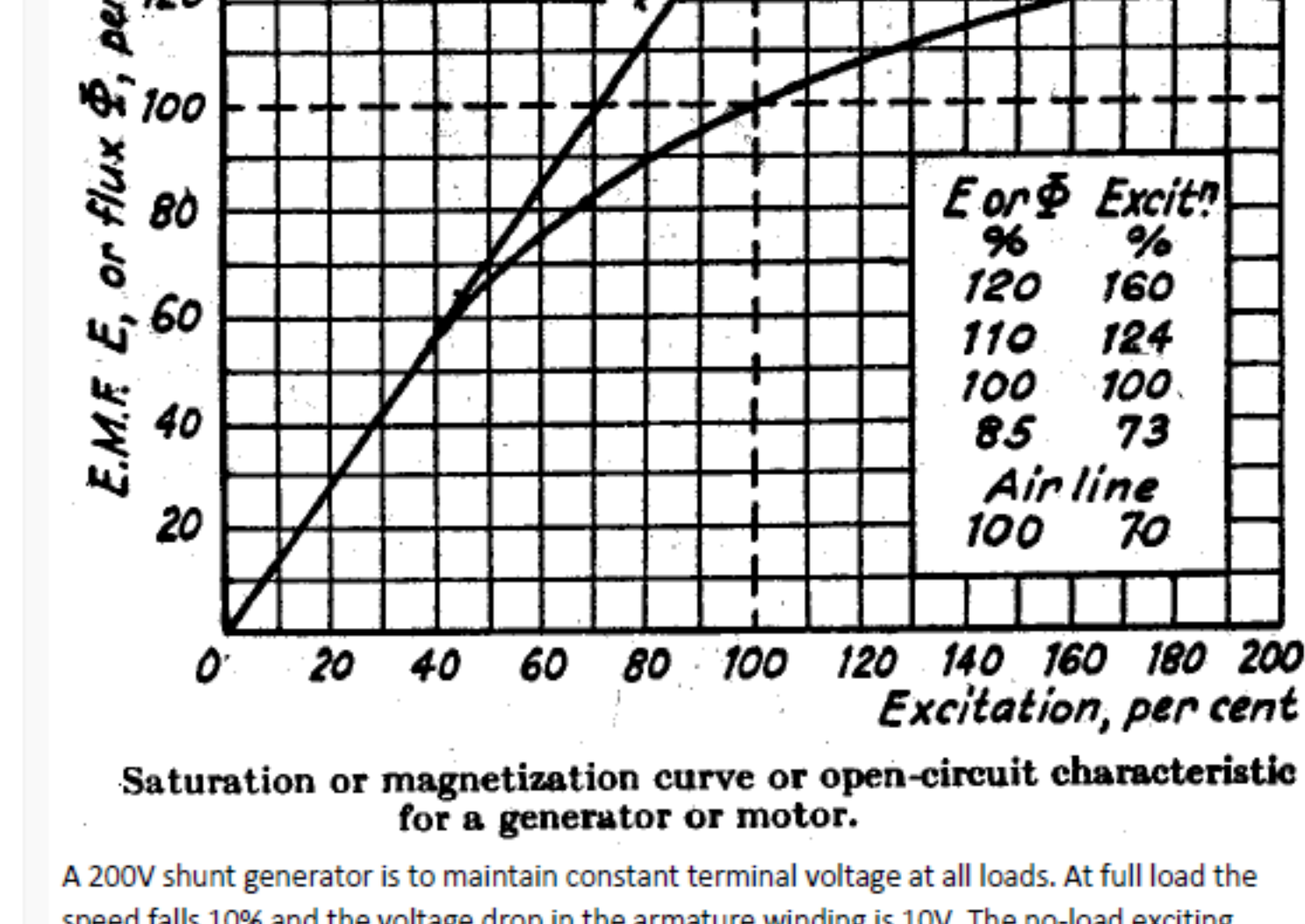
No, the answer is incorrect. Score: 0 Accepted Answers: a.

5) Find the critical speed (in r.p.m.) with $R_f = 25\Omega$ in circuit
 a. Around 150 r.p.m.
 b. Around 300 r.p.m.
 c. Around 450 r.p.m.
 d. Around 600 r.p.m.
 e. None of the above

- a.
- b.
- c.
- d.
- e.

No, the answer is incorrect. Score: 0 Accepted Answers: d.

Common data for Question 6 to 7



Saturation or magnetization curve or open-circuit characteristic for a generator or motor.

A 200V shunt generator is to maintain constant terminal voltage at all loads. At full load the speed falls 10% and the voltage drop in the armature winding is 10V. The no-load exciting current is 4A and the OCC is shown in the figure where 100% represents an induced EMF of 200V and a field current of 4A. Find the change in field resistance from no load to full load.

6) Find the field resistance (in Ω) at no-load
 a. Around 0 Ω
 b. Around 25 Ω
 c. Around 50 Ω
 d. Around 100 Ω
 e. None of the above

- a.
- b.
- c.
- d.
- e.

No, the answer is incorrect. Score: 0 Accepted Answers: c.

7) Find the field resistance (in Ω) at full load
 a. Around 35 Ω
 b. Around 20 Ω
 c. Around 10 Ω
 d. Around 0 Ω
 e. None of the above

- a.
- b.
- c.
- d.
- e.

No, the answer is incorrect. Score: 0 Accepted Answers: a.

Common data for Question 8 to 9

A 4-pole generator supplies a current of 143A to the load. The field winding is shunt connected and takes 10A. It has 492 lap connected armature conductors. When delivering full load, the brushes are given an actual lead of 10° (mechanical).

8) Calculate the demagnetizing armature ampere-turns per pole.
 a. Around 260
 b. Around 520
 c. Around 780
 d. Around 1040
 e. None of the above

- a.
- b.
- c.
- d.
- e.

No, the answer is incorrect. Score: 0 Accepted Answers: b.

9) The field winding is shunt connected and takes 10A. Find the number of extra shunt field turns necessary to neutralize this demagnetization.
 a. Around 26
 b. Around 52
 c. Around 78
 d. Around 104
 e. None of the above

- a.
- b.
- c.
- d.
- e.

No, the answer is incorrect. Score: 0 Accepted Answers: d.

Common data for Question 10 to 12

A DC generator has the following data: 500 conductors, total current = 200A, 6 pole, number of parallel circuits = 2 (wave winding), angle of lead = 10° (mechanical), leakage coefficient = 1.3 (Leakage coefficient = $\frac{\text{Actual or required ampere-turns}}{\text{Effective ampere-turns}}$). Effective AT is less than actual AT because some flux will not go through the desired path)

10) Determine per pole the number of cross ampere-turns.
 a. Around 695
 b. Around 1389
 c. Around 2085
 d. Around 2778
 e. None of the above

- a.
- b.
- c.
- d.
- e.

No, the answer is incorrect. Score: 0 Accepted Answers: d.

11) Determine per pole the number of back ampere turns.
 a. Around 695
 b. Around 1389
 c. Around 2085
 d. Around 2778
 e. None of the above

- a.
- b.
- c.
- d.
- e.

No, the answer is incorrect. Score: 0 Accepted Answers: b.

12) Determine per pole the number of series turns to balance the back ampere-turns.
 a. Around 3
 b. Around 6
 c. Around 9
 d. Around 12
 e. None of the above

- a.
- b.
- c.
- d.
- e.

No, the answer is incorrect. Score: 0 Accepted Answers: c.