

Unit 13 - Week 10

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Week 10 Assignment 10

The due date for submitting this assignment has passed. **Due on 2019-10-09, 23:59 IST.**
As per our records you have not submitted this assignment.

1) A 250V shunt motor on no-load runs at 1000 r.p.m. and takes 5A. The total armature and shunt field resistances are respectively 0.2Ω and 250Ω. Calculate the speed (in r.p.m.) when loaded and taking a current of 50A, if armature reaction weakens the field by 3%

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 991,997

1 point

2) A 250V shunt motor has an armature resistance of 0.5Ω and a field resistance of 250 Ω. When driving at 600 r.p.m. a load, the torque of which is constant, the armature takes 20A. If it be desired to raise the speed from 600 r.p.m. to 800 r.p.m. what resistance (in Ω) must be inserted in the shunt field circuit, assuming the magnetizing curve to be a straight line?

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 83,93

1 point

Common data for Question 3 to 5

A 220V shunt motor with an armature resistance of 0.5Ω is excited to give constant main field. At full load the motor runs at 500 r.p.m. and takes an armature current of 30A. If a resistance of 1Ω is placed in the armature circuit, answer the following questions

3) Find the speed (in r.p.m.) at full-load torque

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 416.8,436.8

1 point

4) Find the speed (in r.p.m.) at double full-load torque

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 307.1,327.1

1 point

5) Find ratio of the stalling torque to the full load torque. (Hint: The stalling torque is the maximum torque the motor can support and after which it will stop or speed will become zero.)

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 4.39,5.39

1 point

Common data for Question 6 to 10

A 240V, 4-pole shunt motor running at 1000 r.p.m. gives 15 h.p. with an armature current of 50A and a field current of 1.0A. The armature winding has 2 parallel circuits (wave connected) and 540 conductors. Its resistance is 0.1Ω and the drop at each brush is 1V.

6) Find useful torque (in Nm)

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 104.8,108.8

1 point

7) Find total torque (in Nm)

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 109.2,113.2

1 point

8) Find Useful flux per pole in (mWb)

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 10.9,14.9

1 point

9) Find the rotational losses (in W)

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 444.5,484.5

1 point

10) Find the efficiency (in %)

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 89.4,93.4

1 point

11) A 250V shunt motor with a constant main field drives a load, the torque of which is proportional to the speed. When running at 500 r.p.m. it takes 40A. Find the speed (in rp.m.) at which it will run if a 25Ω resistance is connected in series with the armature. Neglect motor losses.

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 95,105

1 point

12) A 500V shunt motor taking an armature current of 240A while running at 800 r.p.m. is braked by disconnected the armature from the supply and closing it on a resistance of 2.02Ω, the field excitation remaining constant. Calculate the initial braking current (in A). (Hint: On braking, the motor will suddenly start to act as a generator due to its own inertia.)

Yes, the answer is correct.
Score: 1

Accepted Answers:
(Type: Range) 0,300

1 point

Common data for Question 13 to 14

A series motor with unsaturated magnetic circuit and with negligible resistance, when running at a certain speed on a given load, takes 50A at 500V. The load torque varies as the cube of the speed.

13) Find the resistance (inΩ) necessary to reduce the speed by 50%

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 20.3,26.3

1 point

14) Find the resistance (inΩ) necessary to reduce the speed by 20%

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 4.75,7.25

1 point

Common Data for Question 15 to 16

A 4-pole series-wound fan motor runs normally at 600 r.p.m. on a 250V supply, taking 20A. The field coils are connected all in series. The load torque increases as the square of the speed. The flux is directly proportional to the current and losses are ignorable. Estimate the speed and the current taken by the motor, if the coils are reconnected in two parallel groups of two in series.

15) What is the speed (in r.p.m.) after reconnection?

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 693.5,733.5

1 point

16) How much is the current (in A) after reconnection?

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 30.6,36.6

1 point