Unit 14 - Week 11

Week 11 Assignment 11

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

Due on 2019-10-16, 23:59 IST.

Common data for Question 1 to 3

A 4-pole 220V, 24-h.p. shunt motor has the following data: Field current = 5A; armature resistance = 0.04Ω; flux = 40mWb; 160 armature conductors; 2 parallel paths (wave winding); full-load current = 95A; no-load current = 9A; armature reaction negligible.

1) Find the no load speed — 1 point

a. 530 r.p.m.
b. 1030 r.p.m.
c. 1530 r.p.m.
d. 2030 r.p.m.

a.
b.
c.
d.

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

2) Find full-load speed — 1 point

a. 514 r.p.m.
b. 1014 r.p.m.
c. 1514 r.p.m.
d. 2014 r.p.m.

a.
b.
c.
d.

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

3) Find speed regulation expressed as a percentage of no-load speed — 1 point

a. 0.79%
b. 1.04%
c. 1.56%
d. 3.02%

a.
b.
c.
d.

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

Common data for Question 4 to 5

A 100-h.p., 500V shunt motor has 4 poles and 2 circuit wave connected armature winding with 492 conductors. The flux is 50mWb per pole and the full load efficiency is 92%. The armature winding has a total resistance of 0.1Ω. The shunt field resistance is 250Ω.

4) Calculate the speed at full-load — 1 point

a. 590 r.p.m.
b. 690 r.p.m.
c. 790 r.p.m.
d. 890 r.p.m.

a.
b.
c.
d.

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

5) Calculate the useful torque at full-load — 1 point

a. 1000 Nm
b. 1100 Nm
c. 1200 Nm
d. 1300 Nm

a.
b.
c.
d.

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

Common data for Question 6 to 7

A 240V series motor takes 40A when giving its rated output at 1500 r.p.m. Its resistance is 0.3Ω.

6) Find what resistance must be added to obtain rated torque at starting — 1 point

a. 1.9Ω
b. 3.1Ω
c. 4.4Ω
d. 5.7Ω

a.
b.
c.
d.

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

7) Find what resistance must be added to obtain rated torque at 1000 r.p.m. — 1 point

a. 1.9Ω
b. 3.1Ω
c. 4.4Ω
d. 5.7Ω

a.
b.
c.
d.

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

Common data for Question 8 to 10

A 240V series lift motor has a resistance of 0.2Ω. At a speed of 1800 r.p.m. it takes 40A.

8) Find the resistance to be added to limit the speed to 3600 r.p.m. when the current is 10A, assuming flux proportional to current between 10A and 40A. — 1 point

a. 2.2Ω
b. 7.2Ω
c. 12.2Ω
d. 17.2Ω

a.
b.
c.
d.

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

9) Find the resistance to be added to make the speed 900 r.p.m. when the current is 60 A, given that the flux at 60A as 18% greater than that at 40A. — 1 point

a. 0.38Ω
b. 0.76Ω
c. 1.14Ω
d. 1.52Ω

a.
b.
c.
d.

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

10) At what speed will the motor run when connected directly to the mains and taking 60A? — 1 point

a. 1100 r.p.m.
b. 1300 r.p.m.
c. 1500 r.p.m.
d. 1700 r.p.m.

a.
b.
c.
d.

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

Common data for Question 11 to 13

A 500V series motor with a resistance of 0.5Ω ran at 160 r.p.m. with a current I = 40A, and at 140 r.p.m. with I = 50A.

11) Calculate total resistance (in Ω) required to have a starting current of I = 50A.

No, the answer is incorrect.
Score: 0
Accepted Answers:
Type: Range(8,11)

1 point

12) Calculate speed (in r.p.m.) with total resistance = 10Ω and I = 40A.

No, the answer is incorrect.
Score: 0
Accepted Answers:
Type: Range(90,26

1 point

13) Calculate total resistance (in Ω) with speed = 33.33 r.p.m. and I = 50A

No, the answer is incorrect.
Score: 0
Accepted Answers:
Type: Range(6.74,8.14

1 point

Common data for Question 14 to 17

Two identical 20-h.p. 1000 r.p.m., 250V, series motors A and B are connected in series across 250V supply. They drive the same shaft through reduction gearing 5:1 and 4:1 respectively. The total load torque on the shaft is 810Nm. Losses are negligible and the magnetic circuit is unsaturated.
[Hint: A reduction gearing k : 1 reduces the speed (speed gets divided by k) and increases the torque (torque gets multiplied by k)]

14) Calculate the current from the supply main — 1 point

a. 47.5A
b. 53.6A
c. 59.7A
d. 65.8A

a.
b.
c.
d.

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

15) Calculate the shaft speed — 1 point

a. 140 r.p.m.
b. 280 r.p.m.
c. 420 r.p.m.
d. 560 r.p.m.

a.
b.
c.
d.

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

16) Calculate the voltage across motor **A** — 1 point

a. 99V
b. 111A
c. 125V
d. 139V
e. 151V

a.
b.
c.
d.
e.

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

17) Calculate the voltage across motor **B** — 0 points

a. 99V
b. 111A
c. 125V
d. 139V
e. 151V

a.
b.
c.
d.
e.

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