Unit 15 - week 12

Week 12 Assignment 12

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

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

Common data for Question 1 to 3

In a brake test on a small shunt motor the speed was 1500 r.p.m., the load on one side of the brake band was 28.9N and on the other 1.67N. The diameter of the brake pulley was 15.2cm. The input current was 2A at 250V.

1) Calculate the brake torque (in Nm)

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 1.87,2.27

1 point

2) Calculate the brake horse-power (in h.p.)

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 0.458,0.466

1 point

3) Calculate the percentage efficiency

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 62,68

1 point

Common data for Question 4 to 7

A 250V, 4 pole series motor has a 2 circuit wave winding with 105 slots, each containing 12 conductors. The gap flux per pole is 0.02Wb when the motor is on full-load and taking a current of 45A. The armature and the field resistances are 0.2Ω and 0.1Ω respectively. The iron, friction and windage losses total 700W.

4) Calculate the speed (in r.p.m.) at full-load

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 276.5,286.5

1 point

5) Calculate the available shaft torque (in Nm) on full-load

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 327,347

1 point

6) Calculate the brake horse-power (in h.p.) at full-load

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 11.3,15.3

1 point

7) Calculate the percentage efficiency at full-load

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 84.4,92.4

1 point

Common data for Question 8 to 11

A 250V shunt motor giving 20-h.p. at 1000 r.p.m., takes an armature current of 75A. The armature resistance is 0.25Ω and the load torque remains constant. Then the flux is reduced by 20% of its normal value suddenly.

8) Before the speed changes, find the instantaneous value of the armature current (in A).

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 250,270

1 point

9) Before the speed changes, find the instantaneous value of the torque (in Nm).

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 415,480

1 point

10) Determine the final value of armature current (in A)

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 69.75,97.75

1 point

11) Determine the final speed (in r.p.m.)

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 1200,1250

1 point

Common data for Question 12 to 15

A 500V shunt motor takes 4A on no-load. The armature resistance including that of the brushes is 0.2Ω and the field current is 1A.

12) Estimate the output (in h.p.) when the input current is 20A

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 9.1,12.1

1 point

13) Estimate the percentage efficiency when the input current is 20A

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 75.3,83.3

1 point

14) Estimate the output (in h.p.) when the input current is 100A

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 57.7,65.7

1 point

15) Estimate the percentage efficiency when the input current is 100A

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 88.1,96.1

1 point

Common data for Question 16 to 19

A shunt motor takes a current **I** at speed **n**. All losses are ignorable.

16) Find the current at speed **3n** with field control when the output is constant *1 point*

a. **I** / 9
b. **I** / 3
c. **I**
d. 3 **I**
e. 9 **I**

a.
b.
c.
d.
e.

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

17) Find the current at speed **3n** with field control when the torque is constant *1 point*

a. **I** / 9
b. **I** / 3
c. **I**
d. 3 **I**
e. 9 **I**

a.
b.
c.
d.
e.

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

18) Find the current at speed **3n** with voltage control when the output is constant *1 point*

a. **I** / 9
b. **I** / 3
c. **I**
d. 3 **I**
e. 9 **I**

a.
b.
c.
d.
e.

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

19) Find the current at speed **3n** with voltage control when the torque is constant *1 point*

a. **I** / 9
b. **I** / 3
c. **I**
d. 3 **I**
e. 9 **I**

a.
b.
c.
d.
e.

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

20) A 480V, 25-h.p. shunt motor took 2.5A when running light. Taking armature resistance to be 0.6Ω, field resistance 800Ω and brush drop 2V, find the full load percentage efficiency. *1 point*

a. 59%
b. 69%
c. 79%
d. 89%

a.
b.
c.
d.

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