

Unit 4 - Week-2

Course outline

How to access the portal?

Week 0

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Week-2

- Lecture-6: Speed Torque Characteristics of Separately Excited DC Motor and Series DC Motor
- Lecture-7: Field Control of Series Motor, Motoring and Braking of Separately Excited and Series DC motors
- Lecture-8: Speed Control of Separately Excited DC Motor Using Controlled Rectifiers
- Lecture-9: Analysis of Single Phase Full Controlled Converter-fed Separately Excited DC Motor
- Lecture-10: Speed Torque Characteristics of Full Controlled Converter-fed Separately Excited DC Motor, Analysis of Single Phase Half Controlled Converter-fed Separately Excited DC Motor

Quiz : Assignment 2

- Assignment-2 Solutions
- Feedback For Week 2

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Lecture Notes

Assignment 2

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

Due on 2019-08-21, 23:59 IST.

1) Which is the most efficient way of controlling a dc shunt motor below rated speed? 1 point

- Armature resistance control
- Armature voltage control
- Field resistance control
- Diverter resistance control in field circuit

No, the answer is incorrect.
Score: 0

Accepted Answers:
Armature voltage control

2) In which of the following control methods, the no load speed of a shunt dc motor can be increased beyond rated value? 1 point

- Armature resistance control
- Armature voltage control
- Field resistance control
- Controlling resistance in parallel with armature

No, the answer is incorrect.
Score: 0

Accepted Answers:
Field resistance control

3) What is the ideal no-load speed for a series dc motor? 1 point

- $V/(K\phi)$
- $V/(K\phi)^2$
- zero
- Infinite

No, the answer is incorrect.
Score: 0

Accepted Answers:
Infinite

4) A 200 V, 11 A, 1500 rpm dc shunt motor has armature and field resistance of 0.5 Ω and 200 Ω respectively. The load torque can be assumed to be constant at rated value. What is the motor speed if a resistance of 5 Ω is inserted in the armature circuit? 3 points

- 1115 rpm
- 1222 rpm
- 1328 rpm
- 1404 rpm

No, the answer is incorrect.
Score: 0

Accepted Answers:
1115 rpm

5) A 220 V DC series motor runs at 1000 rpm and takes a current of 50 A when driving a constant torque load. Resistances of armature and field winding are 0.1 Ω each. What is the speed of the motor if the field number of turns are reduced to 80% while driving the same torque load. Assume linear magnetic circuit. 3 points

- 1012 rpm
- 1118 rpm
- 1216 rpm
- 1311 rpm

No, the answer is incorrect.
Score: 0

Accepted Answers:
1118 rpm

6) A full controlled converter is feeding an RL load with R=10 Ω , L=31.83 mH. If input frequency is 50 Hz, the impedance angle (θ) of the load is 2 points

- 30°
- 45°
- 60°
- 75°

No, the answer is incorrect.
Score: 0

Accepted Answers:
45°

7) For Q6, if the input voltage is 230 V, 50 Hz and $\alpha=30^\circ$. What is the average output voltage assuming continuous conduction? 1 point

- 149 V
- 169 V
- 179 V
- 189 V

No, the answer is incorrect.
Score: 0

Accepted Answers:
179 V

8) A 230 V, 50 Hz single phase supply feeds a full controlled converter bridge. The converter bridge is used to power the armature of a separately excited dc motor. The specifications of the dc motor are 200 V, 10 A (armature current), 1000 rpm, $R_a=1 \Omega$. The no-load speed of the motor supplied from the full controlled converter bridge is 3 points

- 179 rad/s
- 169 rad/s
- 159 rad/s
- 129 rad/s

No, the answer is incorrect.
Score: 0

Accepted Answers:
179 rad/s

9) Discontinuous current operation for a full controlled converter fed separately excited dc motor occurs for speed 2 points

- higher than the critical speed
- lower than the critical speed
- higher than 50% of the critical speed
- lower than 50% of the critical speed

No, the answer is incorrect.
Score: 0

Accepted Answers:
higher than the critical speed

10) Extinction angle(β) for a full controlled converter bridge can be calculated by 1 point

- a closed form solution of the relevant equation
- an iterative solution of the relevant equation
- Computation of no load speed of the motor
- Computation of converter output voltage

No, the answer is incorrect.
Score: 0

Accepted Answers:
an iterative solution of the relevant equation

11) During coasting period in a full controlled converter, the armature voltage is 1 point

- same as input ac voltage
- same as the drop across the armature inductance
- same as the armature back emf
- same as the drop across the armature resistance

No, the answer is incorrect.
Score: 0

Accepted Answers:
same as the armature back emf

12) In which of the following methods, the supply voltage to the armature of a separately excited dc motor is reversed? 1 point

- Forward motoring
- Forward regenerative braking
- Forward dynamic braking
- Forward plugging

No, the answer is incorrect.
Score: 0

Accepted Answers:
Forward plugging

13) For a half controlled converter fed dc motor, what is the region for $\pi \leq \omega t \leq \beta$ called? 1 point

- Duty interval
- Coasting interval
- Freewheeling interval
- Zero current interval

No, the answer is incorrect.
Score: 0

Accepted Answers:
Freewheeling interval

14) A 200 V, 900 rpm, 100 A separately excited dc motor has an armature resistance of 0.05 Ω . It is fed from a full controlled converter with an ac voltage of 230 V, 50 Hz. Assuming continuous conduction, calculate the firing angle for rated motor torque and 900 rpm speed. 2 points

- 75°
- 65°
- 30°
- 15°

No, the answer is incorrect.
Score: 0

Accepted Answers:
15°

15) For Q14, calculate the motor speed for rated torque and $\alpha=60^\circ$. 2 points

- 861.2 rpm
- 746.5 rpm
- 505.9 rpm
- 454.7 rpm

No, the answer is incorrect.
Score: 0

Accepted Answers:
454.7 rpm