

Power Electronic Controlled Drives Unit 01: Electrical Drives

Question 1

Load torques can be classified into how many types?

Correct Feedback:

Incorrect Feedback:

Choose one answer.

- ☐ 1. Three
Feedback:
- ☒ 2. Two
Feedback:
- ☐ 3. Four
Feedback:
- ☐ 4. Five
Feedback:

Question 2

Torque inversely varies with the speed in the windage load torque component.

Choose True or False.

- ☐ 1. True
- ☒ 2. False

Question 3

What type of force handles for active torques?

Choose one answer.

- ☐ 1. Strong nuclear forces
- ☐ 2. Weak nuclear forces
- ☒ 3. Gravitational forces
- ☐ 4. Electrostatic forces

Question 4

Passive torques always oppose the motion of the driven machine.

Choose True or False.

- ☒ 1. True
- ☐ 2. False

Question 5

What is the condition for the steady-state operation of the motor?

Choose one answer.

- ☐ 1. Load torque > Motor torque
- ☐ 2. Load torque <<<< Motor torque
- ☒ 3. Load torque = Motor torque
- ☐ 4. Load torque < Motor torque

Question 6

Choose the correct one. (* stands for multiplication, J represents the moment of inertia, w represents angular speed).

Choose one answer.

- ☐ 1. $J \cdot d(w)/dt = \text{Load torque} - \text{Motor torque}$
- ☐ 2. $J \cdot d(w)/dt = \text{Load torque} + \text{Motor torque}$
- ☒ 3. $J \cdot d(w)/dt = \text{Motor torque} - \text{Load torque}$
- ☐ 4. $J \cdot d(w)/dt = \text{Load torque} * \text{Motor torque}$

Question 7

Calculate the power developed by motor using the given data: $E_b = 20V$ and $I = 10 A$. (Assume rotational losses are neglected)

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Choose one answer.

- ☐ 1. 400 W
- ☒ 2. 200 W
- ☐ 3. 300 W
- ☐ 4. 500 W

Question 8

Which one is an example of variable loss?

Choose one answer.

- ☐ 1. Windage loss
- ☐ 2. Hysteresis loss
- ☒ 3. Armature copper loss
- ☐ 4. Friction loss

Question 9

The unit of the torque is _____

Choose one answer.

- ☒ 1. N-m
- ☐ 2. N-m²
- ☐ 3. N-m/sec
- ☐ 4. N-Hz

Question 10

Calculate the value of the torque when 10 N force is applied perpendicular to a 10 m length of rod fixed at the center.

Choose one answer.

- ☒ 1. 100 N-m
- ☐ 2. 200 N-m
- ☐ 3. 300 N-m
- ☐ 4. 400 N-m

Question 11

What is the dimensional formula for torque?

Choose one answer.

- ☒ 1. [ML²T⁻²]
- ☐ 2. [MLT⁻²]
- ☐ 3. [M¹L²T⁻³]
- ☐ 4. [LT⁻²]

Question 12

If the starting torque of the motor is less than the load torque, the motor will fail to start.

Choose True or False.

- ☒ 1. True
- ☐ 2. False

Question 13

Duty cycle (D) is _____

Choose one answer.

- ☐ 1. $T_{on} \div T_{off}$
- ☒ 2. $T_{on} \div (T_{on} + T_{off})$
- ☐ 3. $T_{on} \div 2 \times (T_{on} + T_{off})$
- ☐ 4. $T_{on} \div 2 \times T_{off}$

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Question 14

The unit of angular acceleration is rad/s^2 .
Choose True or False.

- ☒ 1. True
- ☐ 2. False

Question 15

Calculate the shaft power developed by a motor using the given data: $E_b = 50\text{V}$ and $I = 60\text{ A}$. Assume frictional losses are 400 W and windage losses are 600 W.

Choose one answer.

- ☐ 1. 4000 W
- ☒ 2. 2000 W
- ☐ 3. 1000 W
- ☐ 4. 1500 W

Question 16

Function of power modulator is

Choose one answer.

- ☐ 1. Modulates flow of power
- ☐ 2. acts as converter
- ☒ 3. both
- ☐ 4. none of the above

Question 17

Parts of electrical drive

Choose one answer.

- ☒ 1. Power Modulator, electrical motor, source, control unit
- ☐ 2. Electrical Motor, source, control unit
- ☐ 3. Electrical Motor, source, control unit, ramp generator
- ☐ 4. Electrical Motor, source, control unit, converter, ramp generator

Question 18

Choice of Electrical Drives depends on

Choose one answer.

- ☐ 1. steady state operations requirement
- ☐ 2. transient operations requirement
- ☒ 3. both
- ☐ 4. none

Question 19

In forward motoring

Choose one answer.

- ☒ 1. Power Positive and Torque positive
- ☐ 2. Power Negative and Torque positive
- ☐ 3. Power Positive and Torque Negative
- ☐ 4. Power Negative and Torque Negative

Question 20

In forward Braking

Choose one answer.

- ☐ 1. Power Positive and Torque positive
- ☒ 2. Power Negative and Torque positive
- ☐ 3. Power Positive and Torque Negative
- ☐ 4. Power Negative and Torque Negative

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Question 21

In reverse motoring

Choose one answer.

- ☐ 1. Power Positive and Torque positive
- ☐ 2. Power Negative and Torque positive
- ☐ 3. Power Positive and Torque Negative
- ☒ 4. Power Negative and Torque Negative

Question 22

In reverse braking

Choose one answer.

- ☐ 1. Power Positive and Torque positive
- ☐ 2. Power Negative and Torque positive
- ☒ 3. Power Positive and Torque Negative
- ☐ 4. Power Negative and Torque Negative

Question 23

Number of components of load torque are

Choose one answer.

- ☐ 1. 2
- ☒ 2. 3
- ☐ 3. 4
- ☐ 4. 5

Question 24

friction torque can be resolved into ----- number of components.

Choose one answer.

- ☐ 1. 2
- ☒ 2. 3
- ☐ 3. 4
- ☐ 4. 5

Question 25

in fans ,compressors, the load torque is proportional to speed squared

Choose True or False.

- ☒ 1. True
- ☐ 2. False

Question 26

Electric drive operates in -----mode/s.

Choose one answer.

- ☐ 1. steadystate
- ☐ 2. acceleration with starting
- ☐ 3. deceleration including stopping
- ☒ 4. all

Question 27

Acceleration and deceleration are transient mode

Choose True or False.

- ☒ 1. True
- ☐ 2. False

Question 28

Electrical drive is becoming more and more popular because

Choose one answer.

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- ☐ 1. It is simple and reliable
- ☐ 2. It provides smooth and easy control
- ☐ 3. It is cheaper in cost
- ☒ 4. All of the above

Question 29

Electric motor and control system are the basic elements of the electric drive.

Choose True or False.

- ☒ 1. True
- ☐ 2. False

Question 30

What is Load Equalisation?

Choose one answer.

- ☒ 1. Process of smoothing the fluctuating load
- ☐ 2. Process of removing the load
- ☐ 3. Process of changing the voltage level
- ☐ 4. Process of changing the speed