

QUIZ – ANSWER KEY

QUIZ NO: 128

TOPIC: ELECTRICAL ENGINEERING

DATE: 25/11/2022

1. The efficiency of the DC motor at maximum power will be _____?

- [A] 100%
- [B] Around 90%
- [C] Anywhere between 75% and 90%
- [D] Less than 50%

Answer: D

Explanation: For getting maximum power, derivative of power with respect to current is equal to 0. This is practically impossible to achieve as, current required is much more than its normal rated value. Large heat will be produced in a machine and efficiency of motor will be less than 50 %.

2. The hysteresis loss in a DC machine least depends on ___?

- [A] Frequency of magnetic reversals
- [B] Maximum value of flux density
- [C] Volume and grade of iron
- [D] Rate of flow of ventilating air

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Answer: D

Explanation: As iron core of the armature is rotating in magnetic field, some losses occurs in the core which is called core losses. These losses are categorized as Hysteresis loss and Eddy current loss. They depend on all quantities listed above.

3. Which of the following is not the effect of iron loss ?

- [A] Loss of efficiency
- [B] Excessive heating of core
- [C] Increase in terminal voltage
- [D] Rise in temperature of ventilating air

Answer: C

Explanation: Iron loss causes excessive heat production in the core of a machine, which will rise the temperature of ventilating air, as it acts as heat exchanger. Thus, terminal voltage rise is not an effect of any loss.

4. Which of the following loss is likely to have highest proportion at rated load of the DC generator ?

- [A] Hysteresis loss
- [B] Field copper loss
- [C] Armature copper loss
- [D] Eddy current loss

Answer: C

Explanation: Armature copper loss is directly proportional to the square of armature current multiplied by the armature resistance and also the series field resistance if present any. As, at loaded condition armature current is very high.

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5. Which of the following loss in a DC generator varies significantly with the load current?

- [A] Field copper loss
- [B] Windage loss
- [C] Armature copper loss
- [D] Cannot be determined

Answer: C

Explanation: Armature copper loss is directly proportional to the square of armature current, as load current varies armature current varies, which is reflected significantly in loss as a square of it. Thus, armature copper loss can be detected.

6. Which of the following methods is likely to result in reduction of hysteresis loss in a DC generator?

- [A] Providing laminations in armature core
- [B] Providing laminations in stator
- [C] Using non-magnetic material for frame
- [D] Using material of low hysteresis co-efficient for armature core material

Answer: D

Explanation: Providing laminations will work for reducing eddy current losses, but hysteresis loss is dependent on the material chosen. Thus, using different material for core of armature will definitely work.

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7. Which of the following loss/losses in a DC generator is dissipated in the form of heat?
- [A] Mechanical loss
 - [B] Core loss
 - [C] Copper loss
 - [D] Mechanical, Copper and Core

Answer: D

Explanation: All the losses listed above dissipate the heat. This, dissipated heat due to various losses results in increasing the temperature of ventilating air. These losses are dangerous in long running of a machine, can reduce efficiency also.

8. Which of the following losses are significantly reduced by laminating the core of a DC generator?
- [A] Hysteresis losses
 - [B] Eddy current losses
 - [C] Copper losses
 - [D] Windage losses

Answer: B

Explanation: Hysteresis losses can be minimized by using material with lower hysteresis coefficient. Eddy current losses can be minimized by using laminated sheets of core structured together. To reduce other losses, current should be minimized, can't be reduced as it also has lower limit.

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9. The total losses in a well-designed DC generator of 10 kW will be nearly equal to ___ ?
- [A] 100 W
 - [B] 500 W
 - [C] 1000 W
 - [D] 1500 W

Answer: B

Explanation: Total losses in a DC machine can be approximated to 4-5% of its rating from the experimental observations. Thus, 5% of 10 kW is equal to 500 W. It's an approximation formed on various observations.

10. The armature of DC motor is laminated to _____ ?

- [A] To reduce mass
- [B] To reduce hysteresis loss
- [C] To reduce eddy current loss
- [D] To reduce inductance

Answer: C

Explanation: The armature is built up in a cylindrical or drum shape high grade silicon steel in form of lamination. By using laminations, the circular path of eddy currents is terminated. Hence heating and ultimately damage to the armature can be reduced by lamination.

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