Assignment 0

The due date for submitting this assignment has passed. As per our records you have not submitted this assignment. Due on 2019-02-04, 23:59 IST.

Group A

1) Consider a DC motor with armature voltage = 125 V and armature resistance = 0.4 ohm. It is running at 1800 rpm under no load condition. The rated armature current is 30 A. Calculate the rated speed of the motor.

- 1500 rpm
- 1800 rpm
- 1627 rpm
- 900 rpm

No, the answer is incorrect.
Score: 0
Accepted Answers:
1627 rpm

2) Consider a DC motor with armature resistance = 0.3 ohm. The open circuit voltage is 220V at 1000 rpm. Calculate the motor efficiency at 950 rpm.

- 95%
- 90%
- 85%
- 98%

No, the answer is incorrect.
Score: 0
Accepted Answers:
95%

3) Answer in True/False.

No, the answer is incorrect.
Score: 0
Accepted Answers:
1 point
A) Aerosodynamic drag force is lower in cold climate.
B) Ground Clearance should be decreased for low aerodynamic drag force.
C) Wind Velocity always increases aerodynamic drag force.

A)-False, B)-False, C)-True

No, the answer is incorrect.
Score: 0
Accepted Answers:
A)-False, B)-False, C)-True

4) Answer in True/False.

A) Aerodynamic drag force is lower in cold climate.
B) Ground Clearance should be decreased for low aerodynamic drag force.
C) Wind Velocity always increases aerodynamic drag force.

A)-True, B)-True, C)-False

No, the answer is incorrect.
Score: 0
Accepted Answers:
A)-False, B)-True, C)-False

Group B:
A three-phase, 4-pole induction motor draws 55 kW real power from a three-phase, 60 Hz feeder. The copper and iron losses in the stator amount to 4 kW. The mechanical loss is 2 kW. If the motor runs at 1740 rpm:

5) Rotor power loss is

- 2.6 kW
- 1.7 kW
- 49 kW
- 55 kW

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

6) Mechanical power is

- 55 kW
- 56.6 kW
- 47.4 kW
- 49 kW

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

7) Efficiency of the motor is

- 89%
- 92%
- 90%

No, the answer is incorrect.
Score: 0
Accepted Answers:
49 kW
Group C:

8) If angular displacement of a wheel moving on a curved path is \( \Theta = 1.5t + 2t^2 \), where \( t \) is in seconds. Radius of wheel is 60 cm. Angular velocity and linear velocity at \( t = 2 \) sec. will be

- 2.5 rad/sec, 5.4 km/hr
- 1.5 rad/sec, 3.24 km/hr
- 8.5 rad/sec, 18.36 km/hr
- 9.5 rad/sec, 20.52 km/hr

No, the answer is incorrect.
Score: 0
Accepted Answers: 9.5 rad/sec, 20.52 km/hr

9) A body rotates at 300 rotations per minute. The value in radian of the angle described in one second is

- 10
- 10 \( \pi \)
- 8 \( \pi \)
- 1800

No, the answer is incorrect.
Score: 0
Accepted Answers: 10 \( \pi \)

10) Moment of inertia of a wheel is 1000 kgm\(^2\). At a given instant, its angular velocity is 10 rad/sec. After the wheel rotates through an angle of 100 radians, the angular velocity of the wheel is 100 rad/sec. The torque applied on wheel in Nm is

- \( 4.95 \times 10^5 \)
- \( 4.95 \times 10^4 \)
- \( 4.95 \times 10^3 \)
- \( 49.5 \times 10^3 \)

No, the answer is incorrect.
Score: 0
Accepted Answers: \( 4.95 \times 10^4 \)

Group D:

Consider a block on a frictionless slope being pulled by an external force, “F” with increasing velocity.
11. Find the magnitude of forces $F_1$ and $F_2$.

- $F_1 = mg \sin \theta$, $F_2 = mg \cos \theta$
- $F_1 = mg$, $F_2 = F$
- $F_1 = mg \cos \theta$, $F_2 = mg \sin \theta$
- $F_1 = mg \cos \theta$, $F_2 = F$

No, the answer is incorrect.
Score: 0
Accepted Answers:
$F_1 = mg \cos \theta$, $F_2 = mg \sin \theta$

12. Find the acceleration of the block.

- Zero
- $\frac{F - mg \cos \theta}{m}$
- $\frac{F - mg \sin \theta}{m}$
- $\frac{F - mg}{m}$

No, the answer is incorrect.
Score: 0
Accepted Answers:
$\frac{F - mg \sin \theta}{m}$