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Courses » Power System Dynamics, Control and Monitoring

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Unit 5 - Week 3

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Course outline

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Assignment 3

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

Due on 2019-02-20, 23:59 IST

1) 1 point
For balanced steady-state operation, the r.m.s value of the current in the damper winding is to:

- a. The r.m.s value of the armature current
- b. 1.5 times of the r.m.s value of the armature current
- c. Zero
- d. The field current

- a
- b
- c
- d

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

c

2) 1 point
For a 3-phase, salient pole synchronous machine, the reluctance torque attains its maximum value when the torque angle δ (in electrical degrees) is:

- a. 90
- b. 45
- c. 70
- d. 0

- a
- b
- c
- d

No, the answer is incorrect.

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Solution

A 3-phase round rotor synchronous generator delivers a power of $(1 + j0.75)$ p.u to an infinite bus, the voltage of which is fixed at 1.0 p.u. The synchronous reactance is $j1.2$ p.u, and armature resistance is negligible. Find the excitation voltage (in p.u)

- a. 2.2 – 2.3
- b. 2.4 -2.5
- c. 2.0 – 2.1
- d. 1.8 – 1.9

- a
- b
- c
- d

No, the answer is incorrect.

Score: 0

Accepted Answers:

a

4)

1 point

A 3-phase round rotor synchronous generator delivers a power of $(1 + j0.75)$ p.u to an infinite bus, the voltage of which is fixed at 1.0 p.u. The synchronous reactance is $j1.2$ p.u, and armature resistance is negligible. Find the torque angle δ (in electrical degrees)

- a. 25 – 26
- b. 27 -28
- c. 30 – 31
- d. 32 -33

- a
- b
- c
- d

No, the answer is incorrect.

Score: 0

Accepted Answers:

d

5)

1 point

A 3-phase round rotor synchronous machine is operating at unity power factor. The mechanical input to the machine remains unchanged, while the field excitation of the machine is increased. Assume that the machine is connected to an infinite bus. The machine will now operate at:

- a. Lagging power factor
- b. Leading power factor
- c. Unity power factor
- d. Cannot be ascertained

- a
- b
- c
- d

No, the answer is incorrect.

Score: 0

Accepted Answers:

a

6) 1 point

The WR^2 of the rotor (including the turbine rotor) of a 555 MVA, 60 Hz, 2 pole, 3-ph generating unit is 654,158 lb ft².

Find the Moment of inertia (J) in kg.m²

- a. 27,125 – 27,135
- b. 27,335 – 27, 345
- c. 27,545 – 27,555
- d. 28,155 – 28,165

- a
- b
- c
- d

No, the answer is incorrect.

Score: 0

Accepted Answers:

c

7) 1 point

The WR^2 of the rotor (including the turbine rotor) of a 555 MVA, 60 Hz, 2 pole, 3-ph generating unit is 654,158 lb ft².

Find the inertia constant (H) in MW.s/ MVA

- a. 3.5 – 3.6
- b. 1.8 – 1.9
- c. 1.6 – 1.7
- d. 3.7 – 3.8

- a
- b
- c
- d

No, the answer is incorrect.

Score: 0

Accepted Answers:

a

8) 1 point

The WR^2 of the rotor (including the turbine rotor) of a 555 MVA, 60 Hz, 2 pole, 3-ph generating unit is 654,158 lb ft².

Find the stored energy (E) in MJ at rated speed.

- a. 1910 - 1920
- b. 1950 – 1960
- c. 1970 – 1980
- d. 1990 – 2000

- a
- b
- c
- d

No, the answer is incorrect.

Score: 0

Accepted Answers:

b

9)

1 point

The WR^2 of the rotor (including the turbine rotor) of a 555 MVA, 60 Hz, 2 pole, 3-ph generating unit is 654,158 lb ft².

Find the mechanical starting time (in sec)

a. 6.8 – 6.9

b. 7 – 7.1

c. 7.2 – 7.3

d. 7.4 – 7.5

a

b

c

d

No, the answer is incorrect.

Score: 0

Accepted Answers:

b

10)

1 point

The WR^2 of the rotor (including the turbine rotor) of a 555 MVA, 60 Hz, 2 pole, 3-ph generating unit is 654,158 lb ft².

The damping coefficient in p.u torque/p.u speed deviation on machine base is 10. If mechanical torque input to the machine remains constant, while the electrical torque increases 10 % on the machine base (assume a step load change). Find the steady-state speed (in rpm) the machine after the load change. Assume isolated operation of the machine.

a. 3636

b. 3030

c. 2970

d. 3564

a

b

c

d

No, the answer is incorrect.

Score: 0

Accepted Answers:

d

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