QUIZ – ANSWER KEY

QUIZ NO: 136

TOPIC: ELECTRICAL ENGINEERING

DATE: 20/12/2022

1. For a given power system, its zero and maximum regulation will occur at the impedance angle of ?

   [A] 45

   [B] 60

   [C] 35

   [D] 50

   Answer: A
   Explanation: At θ=45°, ZVR and maximum VR coincide.

2. A 200 bus power system has 160 PQ bus. For achieving a load flow solution by N-R in polar coordinates, the minimum number of simultaneous equation to be solved is ____?

   [A] 359

   [B] 334

   [C] 357

   [D] 345

   Answer: A

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Explanation: Total buses = 200
PQ buses = 160
PV buses = 200-160 = 40
Slack bus = 1
Total number of equation = (40-1)*1 + (160*2) = 359

3. A 50 bus power system Ybus has 80% sparsity. The total number of transmission lines will be ____ ?

[A] 225

[B] 563

[C] 345

[D] 456

Answer: A
Explanation: Number of non zero elements = 50*50*20/100 = 500 non zero
Number of TL = (500-50)/2 = 225 transmission lines.

4. A power system has a maximum load of 15 MW. Annual load factor is 50%. The reserve capacity of plant is _____ if the plant capacity factor is 40% ?

[A] 3.75 MW

[B] 7.75 MW

[C] 46.75 MW

[D] 8.75 MW

Answer: A

Explanation: LF = (Average Demand)/(Maximum Demand)=0.5
Plant capacity factor =(Average Load)/(Plant Capacity)= 0.5/0.4
Plant capacity= (0.5/0.4)*15 = 18.75 MW
Reserve Capacity = 18.75-15 = 3.75 MW

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5. If the power system network is at Vs∠δ and receiving end voltage is Vr∠0 consisting of the impedance of TL as (R+j5)Ω. For maximum power transfer to the load, the most appropriate value of resistance R should be __ ?

   [A] 1.732

   [B] 3.45

   [C] 5.2

   [D] 0.33

   Answer: A

   Explanation:

   For maximum power transfer, X=√3 R
   3=√3 R
   R=√3

6. Voltage regulation in the power system is ____ ?

   [A] dip in voltage at sending end

   [B] rise in voltage at sending end

   [C] rise in voltage at receiving end

   [D] dip in voltage at receiving end

   Answer: C

   Explanation: VR is rise in voltage at receiving end for a transmission line

7. Which of the following is not an advantage of hydroelectric power plant ?

   [A] no fuel requirement
   [B] continuous power source
   [C] low running cost
   [D] no standby losses

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Answer: B

Explanation: Output of such plants is never constant. This is because of their dependency over flow rate of water in river which is seasonal. No fuel requirement low running cost and no standby losses are advantages of hydroelectric power plants.

8. Which of the following part of thermal power plant causes maximum energy losses?

[A] Alternator
[B] Ash and unburnt carbon
[C] Boiler
[D] Condenser

Answer: D

Explanation: About 54% of energy losses occurs in condenser. Losses in boiler and alternator are about 1% and 16% because of such high losses overall efficiency of thermal power plant reduces to 29% for normal old thermal power plant and 50% for modern super critical pressure steam power plant which employs many heat saving devices.

9. What of the below mentioned statements are incorrect as compared to the HVDC system?

[A] Distance limitation
[B] Back to back connection is possible
[C] Extra reactive power compensation
[D] More corona losses

Answer: D

Explanation: Out of all the corona losses are less in HVDC system.

10. Which of the following power plants can be profitably employed for supplying base loads as well as peak loads?

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[A] Diesel power plant
[B] Hydroelectric power plant
[C] Thermal power plant
[D] Nuclear power plant

Answer: B

Explanation: Seam and Nuclear power plants are only used to supply base load. Diesel power plants are suitable for only peak load. Only hydroelectric power plant can supply both peak load as well as base load because of its flexibility in operation and low operating cost.