65/2015 (Pages : 3)

Maximum : 200 marks

Time : $1\frac{1}{2}$ hours

PART I

Each answer shall be limited to one sentence

A. Write the full form of the following acronyms

1. SCADA
2. MNRE
3. ACSR
4. PGCIL
5. FACTS

B. Fill in the Blanks

6. The value of fusing factor is always ———— than one.
7. The inertia of two groups of machines which swing together are M_1 and M_2. The inertia constant of the system is ————.
8. The value of the plant at the end of its useful life is known as ———— value.
9. SIL means ————.
10. When a sinusoidal voltage is applied across RL series circuit having $R = X_L$, the phase angle will be ————.
11. Potential transformers are used for measurement of ———— by means of low range voltmeters.
12. If a damping factor of a system is zero, then it is called ———— system.
13. If the system shows two phase cross over frequencies, then the system is conditionally ————.
14. The gain stability of an instrument amplifier is ————.
15. If the lower level is zero and upper level is 1, then the logic is said to be ————.
16. A power semiconductor that combines the characteristics of BJT and MOSFET is ————

[P.T.O.]

17. The utilization factor of a power station is ———————— than one.

18. The condition for series resonance is ————————.

19. A source having internal impedance of $(3+j4)\,\Omega$ is to deliver maximum power to a resistive load. The load resistance should be ———————— Ω.

20. Autotransformer is used to ———————— and ———————— voltage.

C. Choose the correct answer

21. The area of the hysteresis loop represents

(a) magnetic flux (b) permeance

(c) energy loss/cycle (d) mmf/cycle

22. The highest value of thermal conductivity is for

(a) Aluminium (b) brass

(c) Copper (d) Iron

23. Feeder is designed mainly from the point of view of

(a) its current carrying capacity (b) voltage drop in it

(c) operating voltage (d) operating frequency

24. Bulk power transmission over long HVDC lines are preferred an account of

(a) low cost of HVDC terminals (b) no harmonic problems

(c) minimum line power losses (d) simple protection

25. The critical clearing time of a fault in power system is related to

(a) reactive power limit (b) short circuit limit

(c) steady state stability limit (d) transient stability limit

26. The excessive motor vibration is caused by

(a) worn bearings (b) open armature coil

(c) bent shaft (d) excessive brush tension

27. The power rating of an electric drive is measured by considering its losses proportional to

(a) *power* (b) *power*^{2}

(c) *power*^{3} (d) *torque*

28. The resistivity of a material is

(a) $\frac{Ra}{l}$ (b) $\frac{Rl}{a}$

(c) $\frac{l}{Ra}$ (d) Rla

29. The power factor at the lower power frequency of a RLC series circuit is

(a) 0.5 lagging (b) 0.5 leading

(c) unity (d) 0.707 leading

30. A synchronous compensator absorbs inductive reactive power. It is

(a) over excited (b) normally excited

(c) under excited (d) none of these $(30 \times 4 = 120)$

PART II

Answer the following questions limited to one paragraph

31. Explain the conditions for parallel operation of alternators.

32. What factors govern selection of motor for a drive?

33. What is the necessity of dc choke coil and freewheeling diode in a converter circuit?

34. Define string efficiency and mention the methods to improve string efficiency.

35. Write Mason Gain formulae for signal flow graph.

36. Explain the factors affected on the resistance of a wire.

37. Using Routh criterion, determine the stability of the system represented by the characteristic equation, $s^4 + 8s^3 + 18s^2 + 16s + 5 = 0$. Comment on the location of the roots of characteristic equation.

38. Derive swing equation. $(8 \times 10 = 80)$