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Sample Question Paper for M.Tech
(Electrical Engineering) SPSAT'18

INSTRUCTIONS

The test is 60 minutes long and consists of 40 multiple choice questions (MCQ) adding up to 40 marks.

1. If in a circuit the voltage is reduced to half and resistance is double, the current will be come.
(a) Four time (b) Double (c) A Quarter (d) Half
2. For the same voltage, the ratio of resistances of 25 W and 100 W lamps will be.
(a) 1:1 (b) 2:1 (c) 4:1 (d) 1:4
3. In an R-L circuit connected to an alternating sinusoidal voltage, the magnitude of transient current primarily depends on the.
(a) Instant in the voltage cycle at which circuit is closed
(b) Impedance of the circuit
(c) Frequency of the voltage
(d) Peak value of steady state current
4. Which of the following statements is false in case of a series circuit?
(a) The voltage drop across each resistor is the same
(b) The current flowing through each resistor is the same
(c) Applied voltage is equal to the sum of voltage drops across individual resistors.
(d) Resistors are additive
5. The efficiency of a transformer is mainly dependent on
(a) core losses (b) stray losse (c) copper losses (d) dielectric losses
6. If the voltage is reduced to half, the torque developed by an induction motor will be reduced to _____%
(a) 25 (b) 12.5 (c) 50 (d) None of the above
7. A 3-phase, 400 volts, 50 Hz, 100 KW, 4 pole squirrel cage induction motor with a rated slip of 2% will have a rotor speed of
(a) 1500 rpm (b) 1470 rpm (c) 1530 rpm (d) 1570 rpm
8. The voltage at the two ends of a transmission line are 132 KV and its reactance is 40 ohm. The Capacity of the line is
(a) 435.6 MW (b) 217.8 MW (c) 251.5 MW (d) 500 MW

9. A 220/440 V, 50 Hz, 5 KVA, single phase transformer operates on 220V, 40Hz supply with secondary winding open circuited. Then
- Both eddy current and hysteresis losses decreases
 - Both eddy current and hysteresis losses increases
 - Eddy current loss remains the same but hysteresis loss increases
 - Eddy current loss increases but hysteresis loss remains the same
10. A synchronous motor is operating on no-load at unity power factor. If the field current is increased, power factor will become
- Leading & current will decrease
 - Lagging & current will increase
 - Lagging & current will decrease
 - Leading & current will increase
11. A D.C. shunt motor runs at no load speed of 1140 r.p.m. At full load, armature reaction weakens the main flux by 5% whereas the armature circuit voltage drops by 10%. The motor full load speed in r.p.m. is
- 1080
 - 1203
 - 1000
 - 1200
12. No load current in a transformer:
- Lags the applied voltage by 90°
 - Lags the applied voltage by somewhat less than 90°
 - Leads the applied voltage by 90°
 - Leads the applied voltage by somewhat less than 90°
13. The power factor of a squirrel cage induction motor is
- Low at light load only
 - Low at heavy load only
 - Low at light and heavy load both
 - Low at rated load only
14. In a stepper motor the angular displacement
- Can be precisely controlled
 - It cannot be readily interfaced with microcomputer based controller
 - The angular displacement cannot be precisely controlled
 - It cannot be used for positioning of work tables and tools in NC machines
15. The generation voltage is usually
- Between 11 KV and 33 KV
 - Between 132 KV and 400 KV
 - Between 400 KV and 700 KV
 - None of the above
16. If a transformer primary is energized from a square wave voltage source, its output voltage will be
- A square wave
 - A sine wave
 - A triangular wave
 - A pulse wave
17. The rotor frequency for a 3 phase 1000 RPM 6 pole induction motor with a slip of

0.04 is _____ Hz

- (a) 8 (b) 4 (c) 6 (d) 2

18. In Fleming's right-hand rule, the thumb point towards

- (a) Direction of flux (b) Direction of induced e.m.f.
(c) Direction of motion of conductor, if fore finger points along the lines of flux
(d) Direction of motion of the conductor' if fore finger point in the direction of generated e.m.f.

19. The resistance of armature winding depends on

- (a) Number of conductors (b) Number of poles
(c) Cross-sectional area of die conductor (d) All of the above

20. Armature resistance of a d.c. machine is about

- (a) 0.1Ω (b) $2.5 \text{ Q } \Omega$ (c) 200Ω (d) None of the above

21. On which of the following principle does the D.C. motor work?

- (a) Corkscrew rule (b) Right hand thumb rule
(c) Fleming's left hand rule (d) Fleming's right hand rule

22. Overhead system can be designed for operation up to

- (a) 11 kV (b) 33 kV (c) 66 kV (d) 400 kV

23. High voltage transmission lines use

- (a) Suspension insulators (b) Pin insulators
(c) Both (a) and (b) (d) None of the above

24. The presence of ozone due to corona is harmful because it

- (a) Reduces power factor (b) Corrodes the material
(c) Gives odour (d) None of the above

25 The power transmitted will be maximum when

- (a) Corona losses are minimum (b) Reactance is high
(c) Sending end voltage is more (d) Receiving end voltage is more

26. In a 60Hz induction motor full load speed is 850 rpm then what is the Synchronous speed?

- (a) 900 rpm (b) 950 rpm (c) 1600 rpm (d) 2000 rpm

27. A synchronous Motor is running at synchronous speed, if all of sudden D.C. excitation is removed, then

- (a) It will rotate at slip speed (b) It will stop
(c) It will continue to rotate at synchronous speed (d) None of the above

28. A transmission line is designed for 50Hz, 440KV. If we want to transfer power at 60Hz, 440 KV, then the power transfer capability will

- (a) Decrease (b) Increase
(c) None of the above (d) Remain same

29. An AC tachometer is just a _____ with one phase excited from the carrier frequency
- (a) Two-phase A.C. servomotor (b) Two-phase induction motor
(c) A.C. operated universal motor (d) Hybrid stepper motor
30. Two transformers operating in parallel will share the load depending upon their
- (a) Rating (b) Leakage reactance (c) Efficiency (d) Per-unit impedance
31. In DC generators, armature reaction is produced actually by
- (a) Its field current (b) Armature conductors
(c) Field pole winding (d) Load current in armature
32. The temperature of resistance furnaces can be controlled by changing the:
- (a) Applied voltage (b) Number of heating elements
(c) Circuit configuration (d) All of the above
33. A single phase transformer has a maximum efficiency of 90% at 111 load and unity power factor. Efficiency at half load at the same power factor is:
- (a) 86.7% (b) 88.26% (c) 88.9% (d) 87.8%
34. What is the power transferred conductively from primary to secondary of an auto-transformer having transformation ratio of 0.8 supplying a load of 3 KW?
- (a) 0.6 KW (b) 2.4 KW (c) 1.5 KW (d) 0.27 KW
35. A 20kVA, 2000/200V, 1-phase transformer has name-plate leakage impedance of 8%. Voltage required to be applied on the high-voltage side to circulate full-load current with the low-voltage winding short circuited will be:
- (a) 16 V (b) 56.56 V (c) 160 V (d) 568.68 V
36. Permeance is the reciprocal of
- (a) Flux density (b) Reluctance (c) Ampere-turns (d) Resistance
37. The e.m.f. generated in a D.C. generator is directly proportional to
- (a) Flux/pole (b) Speed of armature (c) Number of poles (d) All of the above
38. In D.C. generators on no-load, the air gap flux distribution in space is
- (a) Sinusoidal (b) Triangular (c) Pulsating (d) Flat topped
39. A shunt generator running at 1000 r.p.m. has generated e.m.f. as 200 V. If the speed increases to 1200 r.p.m., the generated e.m.f. will be nearly
- (a) 150 V (b) 175 V (c) 240 V (d) 290 V
40. The purpose of providing dummy coils in a generator is
- (a) To reduce eddy current losses (b) To enhance flux density
(c) To amplify voltage (d) To provide mechanical balance for the rotor