1.If the applied voltage of a certain transformer is increased hr 50% and the frequency is reduced to 50% (assuming that the magnetic circuit remains unsaturated), the maximum core flax density will
(a) change to three times the original value
(b) change to 1.5 times the original value
(c) change to 0.5 times as the original value
(d) remain the same as the original value

2. The low—voltage winding of a core type transformer is subdivided into two equal halves, each of half the original width of the single winding will the high voltage winding in between (instead of having the usual construction of low-voltage winding adjacent to the core and surrounded by the high-voltage winding). Such an interlacing of coils would make the combined primary and secondary leakage reactance (in terms of primary) nearly.
(a)twice
(b) equal
(c)half
(d) one -fourth

3. Two 3-limb, 3-phase delta-star connected transformers are supplied from the same source. One of the transformers is of. Dy I and the other is of Dy II / connection. The phase difference between the corresponding phase voltages of the secondaries would he
(a) 0°
(b) 30°
(c) 60°
(d) 120°

4. In a transformer fed from a fundamental frequency voltage source, the source of harmonics k the
(a) overload
(b) poor insulation
(c) iron loss
(d) saturation of core

5. A 40 kVA transformer/ a core loss of400 W and a full load copper of of 800 W. The proportion of full-load at maximum efficiency is
(a)50%
(b) 62.3%
(c) 70.7%
(d)100 %

6.A single phase transformer has rating of 15 KVA 600 / 120 V. It is recommended as an auto transformer to supply at 720 V from a 600 V primary source. The maximum load it can supply is ?
(a)90 kVA
(b)18 kVA
(c)15 kVA
(d) 12 kVA

7. Equalizing pulses in TV are placed during the
(a) vertical blanking period
(b) horizontal blanking period
(c)serration
(d) horizontal retrace

8. The most useful approach to radar system for monitoring the speed of moving vehicles is:
(a) Pulsed radar
(b) Monopulse
(c)Doppler radar
(d) Auto tracking radar

9. A. dc shunt generator, when driven at its rated speed, is found to he not generating any voltage. Which of the following would account for this?
I. There is no residual magnetism
2. The connection of the field winding is not proper with respect to the armature terminals.
3. The resistance of the field circuit is greater than the critical field resistance.
4. The load resistance is less than the critical armature resistance.
Select the correct answer using the codes given below:
Codes:
(a)3 and 4
(b)l,2 and 4
(c)1,2 and 3
(d)l.2,3 and 4

10. To have spark/as commutation, the armature reaction effect in a dc machine is neutralised by
(a) using compensating winding and commutating poles
(b) Shifting the brush axis from the geometrical neutral axis to the magnetic neutral axis
(c) fixing the brush axis in line with the pole axis
(d) increasing the field excitation

11.In a dc shunt general or working on load, the brushes are moved forward in the direction of rotation, as a result of this, commutation will
(a)improve but terminal voltage will fall -
(b)worsen and terminal voltage will fall
(c) improve and terminal voltage will rise
(d) worsen and terminal voltage will rise

12. Consider the following statements:
The maximum range of radar can be increased by
1. increasing the peak transmitted power
2. increasing the gain of the receiver
3. increasing the diameter of the antenna
4. reducing the wavelength used
Of these statements
(a) 1, 3 and 4 are correct
(b) 1, 2, 3 and 4 are correct
(c) 2 and 4 are correct
(d)1 and 3 are correct

13. Consider the following statements about broadband communication using submarine cables:
1. A submarine cable repeater contains filters for the two directions of transmits
2. Armored submarine cable is used for the shallow-shore ends of the cable.
3. Fibre optic submarine cable is used to prevent inadvertent ploughing in of the cable
Of these statements
(a) 1 and 2 are correct
(b) 2 and 3 are correct
(c) 1 and 3 are correct
(d) 1, 2 and 3 are correct

14. A dc overcompounded generator was operating satisfactorily and supplying power to an infinite bus when the prime mover failed to supply any mechanical power. The machine would then run as a ?
(a) cumulatively compounded motor with speed reversed
(b) cumulatively compounded motor with direction of rotation as before
(c) differentially compounded motor with speed reversed
(d) differentially compounded motor with direction of speed as before.

15 To couple a coaxial line to a parallel wire line, It is best to use a
(a) slotted line
(b) balun
(c)directional coupler
(a) quarter-wave transformer

16. When a synchronous motor is running at synchronous speed, the damper winding produces
(a) damping toruqe
(b) eddy current torque
(c)torques aiding the developing torque
(d) no torque

17. For a given developed power, a synchronous motor operating from a constant voltage and constant frequency supply, will draw the minimum and maximum armature currents, Imin and Imax respectively, corresponding to?
(a)Imin at unity pf, but Imax at zero pf
(b) Imax at unity p, but Imin at zero p1
(c) both Imin and Imax at unity pf
(d )both Imin and Imax at zero pf

18. Consider the folio wing statements regarding an RC phase-shift oscillator:
1. The amplifier gain is positive
2. The amplifier gain is negative.
3. The phase shift introduced by the feedback network is 180
4. The phase shift introduced by the feedback network is 360
Of these statements
(a) 1 and 3 are correct
(b) 2 and 3 are correct
(c) 2 and 4 are correct
(d) 1 and 4 are correct

19 While conducting a "slip " test for determination of direct and quadrature axis synchronous reactance 'Xd' and 'Xq' of salient pole synchronous machine, the rotor of the machine is run with a slip 's' and stator supply frequency 'f'. The frequency of
1. voltage induced across open field terminals,
2. envelope of the armature terminal voltage.
3. envelope of the armature current, and
4. armature current
will be respectively
(a) sf, sf,sf and f
(b) sf, f,sf and f
(c) f, sf,f and af
(d) f, (1-s)f,(2-s)f and sf

20. If two induction motors A and B are identical except that the air-gap of motor 'A ' is 59% greater than that of motor 'B', then
(a) the no-load power factor of A will be better than that of B.
(b) the no-load power factor of A will be poorer than that of B.
(c) the core losses of A will be more than those of B
(d) the operating flux of A will be smaller than that of B.

21 A 6-pole, 50 Hz, 3-phase synchronous motor and an 8-pole, 50 Hz. 3—phase slipring induction motor are mechanically coupled and operate on the some 3-phase, 50 Hz supply system If they are left open-circuited, then the frequency of the voltage produced across any two slip rings would be?
(a) 12.5 Hz
(b) 25.0 Hz

(c) 37.5 Hz
(d) 50.0 Hz

22. Which of the following statements regarding skewing of motor bars in a squirrel-cage induction motor are correct?
I. It prevents cogging;
2. It produces more uniform torque.
3. it increases starting torque.
4. It reduces motor 'hum' during its operation.
Select the correct answer using the codes given below.
Codes:
(a)2,3 and 4
(b) l,2 and 3
(c)1,3 and 4
(d) l,2 and 4

23. The rotor power output of a 3-phase induction motor is 15kW and the corresponding slip is 4%. The rotor copper loss will be
(a) 600 W
(b) 625 W
(c) 650 W
(d) 700 W

24. If an input signal with non-zero dc component is applied to a low pass RC network, the dc component in the output will be ?
(a) the same as that in the input
(b) less than that in the input
(c) more than that in the input
(d) zero

25. A 3 phase wound rotor induction motor, when started with load connected to its shaft, was found to start but settle down at about half synchronous speed. If the rotor winding as well as the stator winding were star connected, then the cause of the malfunction could be attributed to
(a) one of the stator phase windings being short–circuited
(b) one of the supply fuses being blown
(c) one of the rotor phases being open-circuited
(d) two of the rotor phases being open circuited

26. Consider the following statements regarding fractional horse power shaded-pole motor:
1. Its direction of rotation is from unshaded to shaded portion of the poles.
2.. Its direction of rotation is from shaded to unshaded portion of the poles.
3. It can remain stalled for short periods without any harm.
4. It has a very poor power factor.
Of these statements
(a) 1, 3 and 4 are correct
(b) 2, 3 and 4 are correct
(c) 2 and 4 are correct
(d) 1 and 3 are correct

27. In the case of a converter-inverter speed control arrangement f an induction motor operating with v/f constant and with negligible stator impedance.
(a) the maximum torque is independent of frequency
(b) the maximum torque is proportional to frequency
(c) the slip at maximum torque is proportional to frequency
(d) the starting torque is proportional to frequency

28 An amplifier with mid-band gain A = 500 has negative feedback beta = 1/100 the upper cut-off without feedback were at 60 kHz, then with feedback it would become
(a) 10kHz
(b) 12kHz
(c) 300 kHz
(d) 360 kHz

29. If the discharge is 1 m cube and the head of water is 1 m then the power generated by the alternator in one hour (assume 100% efficiency of generator and turbine) will be
(a) 10kW
(b) 73/75kW
(c) 746/75kW
(d) 100kw

30. Control rods used In unclear reactors are made of
(a) zirconium
(b) boron
(c) beryllium
(d) lead

31. if alpha = 0.98, Ico=6 microA I beta =100 microA for a transistor, Then the value of Ic will he
(a) 2.3mA
(b) 3.lmA
(c) 4.6mA
(d) 5.2mA

32. In a 3-core extra-high voltage cable, a metallic screen around each core-insulation is provided to
(a) facilitate heat dissipation
(h) give mechanic strength
(c) obtain radial electric stress
(d) obtain longitudinal electric stress

33. Galloping In transmission line conductors arises generally due to
(a) asymmetrical layers of ice formation
(b) vortex phenomenon in light winds
(c) heavy weight of the line conductors
(d) adoption of horizontal conductor configurations

34.. In a 3- phase rectifier circuit, thyristor number 1, 2 and 3 are connected respectively to R, Y and B phases of the star-connected transformer secondary. When the current is being commutated front thyristor No. 1 to No. 2, the effect of the transformer leakage and the ac system Inductance will be such that it will?

(a) Prolong the conduction in No. 1 and delay the turn on of No. 2 correspondingly.
(b) stop the conduction in No. 1 at the scheduled time, but delay the turn on of No. 2
(c) produce conduction in both No. 1 and No. 2 in parallel for an overlapping period through a transient
(d) double the voltage output through a commutation transient

35. The incremental generating costs of two generating units are given by
IC1=0.10 X + 20 Rs /MWhr
IC1=0.15 Y + 18 Rs /MWhr
where X and V are power generated by the two units in MW.
For a total demand of 300 MW, the value (in MW) of X and Y will be respectively
(a) 172 and 123
(b) 123 and 172
(c) 175 and 125

(d) 200 and 100

36. Consider the following statements:
To provide reliable protection for a distribution transformer against over voltages using lightning arrestors, it is essential that the
1. lead resistance is high.
2. distance between the transformer and the arrestor is small
3. transformer and the arrestor have a common inter-connecting ground.
4. Spark over voltage of the arrestor is greater than the residual voltage.
Of these statements
(a) 1, 3 and 4 are correct
(b) 2 and 3 are correct
(c)2, 3 and 4 are correct
(d) 1 and 4 are correct

37. The reflection coefficient of a short-circuited line is
(a) -1
(b) 1
(c) 0.5
(d) zero

38.Iif an intrinsic semiconductors is doped with a very small amount of born then in the extrinsic semiconductor so farmed, the number of electrons and holes will
(a)decrease
(b) increase and decrease respectively
(c)increase
(d) decrease and increase respectively

39. Hollow conductors are used in transmission lines to
(a) reduce weight of copper
(b) improve stability
(c) reduce corona
(d) increase power transmission capacity

40. In the solution of load-flow equation, Newton-Raphson (NR) method is superior to the Gauss-Seidel (GS) method, because the
(a) time taken to perform one iteration in the NR method is less When compared to the time taken in the OS method
(b) number of iterations required in the NR method is more when compared to that in the GS method
(c) number of iterations required is not independent of the size of the system in the NR method
(d) convergence characteristics of the NR method are not affected by the selection of slack bus

41. In a synchronous generator, a divided winding rotor is preferable to a conventional winding rotor because of
(a) higher efficiency
(b) increased steady-state stability limit
(c) higher short-circuit ratio
(d) better damping

42. Consider the following statements regarding speed control of induction motors by means of external rotor resistors:
1. Reduction in speed is accompanied by reduced efficiency.
2. With a large resistance in the rotor circuit, the speed would vary considerably with variation in torque
3. The method is very complicated

The Disadvantages of such a method of speed control would include
(a) l and 2
(b) 2 and 3
(c) l and 3
(d) 1,2 and 3

43. Zero sequence currents can flow from a line into a transformer bank if the windings are in ?
(a) grounded star/delta
(b) delta/star
(c) star/grounded star
(d) delta/delta

44. When a line to ground fault occurs, the current in a faulted phase is 100 A. The Zero Sequence current in this case will be
(a) zero
(b) 33.3 A
(c) 66.6A
(d) 100 A

45. Consider the following statements:
Switched mode power supplies are preferred over the continuous types, because they are

1. suitable for use in both ac and dc.
2; more efficient,
3. suitable for low-power circuits.
4. suitable for high-power circuits.
Of these statements
(a) 1 and 2 are correct
(b) 1 and 3 are correct
(c) 2 and 3 are correct
(d) 2 and 4 are correct

46. The power generated by two plants are P1 = 50MW, P2= 40 MW.
If the loss coefficients are B11 = 0.001, B22 = 0.0025 and B12 = -0.0005, the power loss will be
(a)5.5 MW
(b) 6.5 MW
(c) 4.5Mw
(d) 8.5 MW

47. In dc choppers, per unit ripple is maximum when then duty cycle is?
(a) 0.2
(b) 0.5
(c) 0.7
(d) 0.9

48. The following data pertain to two alternators working in parallel and supplying a total load of 80 MW:
Machine 1 : 40 MVA with 5% speed regulation
Machine 2: 60 MVA with 5% speed regulation
The load sharing between machines 1 and 2 will be
(a)P1/48MW, P2/32MW
(b) 40MW. 40MW
(c)30MW,50MW
(d) 32 MW. 48MW

49. The per unit impedance of a synchronous machine is 0.242. If the base voltage is Increased by 1.1 times, the per unit value will be

(a)0.266
(b) 0.242
(c)0.220
(d) 0.200

50. A 3-pulse converter feeds a pure resistive load at a firing angle of alpha = 60°. The average value of current flowing in the load is 10 A, If a very large inductance is connected in the load circuit, then the
(a) average value of current will remain as 10 A
(b) average value of current wilt become greater than 10 A
(c) average value of current will become less than 10 A
(d) trend of variation of current cannot be predicted unless the exact value of the inductance connected is known

Answers

1a
2c
3c
4d
5c
6a
7a
8c
9c
10a
11a
12b
13c
14d
15b
16d
17a
18b
19c
20a
21b
22c
23b
24a
25a
26b
27a
28d
29d
30b
31d
32a
33a
34c
35a
36c
37a
38d

39c
40d
41b
42a
43a
44b
45c
46a
47b
48c
49d
50b