2023 SUPER MOCK APPLIED ELECTRICITY 1

PAPER 1 **1 hour**

[50 marks]

Answer **all** *the questions.*

Each *question is followed by* **four** *options lettered A to D. Find out the correct option for* **each** *question and shade* **in pencil** *on your answer sheet, the answer space which bears the same letter as the option you have chosen. Give only* **one** *answer to* **each** question*. Think carefully before you shade the correct space; erase completely any answer(s) you wish to change.*

1. The force which ensures the accuracy of the quantity being measured by a measuring instrument is
A. deflection force
B. damping force
C. controlling force
D. restoring force

2. Which of the following measuring instruments is affected by stray magnet?
A. moving coil
B. moving iron
C. dynamometer
D. wattmeter

3. A 1KΩ resistor has a voltage drop of 4V. The power dissipated in it is
A. 0.004W
B. 0.016W
C. 250,000W
D. 400,000W

4. An exciter is a d.c.
A. shunt motor
B. series motor
C. shunt generator
D. series generator

5. The speed of a synchronous motor depends on the
A. length of the field windings
B. number of turns of the armature windings
C. frequency of the supply
D. armature current

6. The generated e.m.f. in an alternator increases if the
A. flux per pole increased
B. flux per pole is decreased
C. speed is decreased
D. speed is reversed

7. The general equation of frequency of an alternator is

A. $\frac{p}{2} x \frac{N}{60}$

B. $\frac{p}{2} x \frac{60}{N}$

C. $\frac{2}{p} x \frac{N}{60}$

D. $\frac{P}{N} x \frac{2N}{3(60)}$

8. When the speed of an alternator is changed from 1000 r.p.m. to 1500 r.p.m. the number of poles would be

A. 4

B. 6.

C. 12

D. 2

9. The cathode-ray tube is ideal for

A. displaying square waveforms only

B. displaying simple and complex waveform

C. measuring current and frequency

D. measuring d.c voltages accurately

10. To limit the operating temperature, an electrical machine should run at its appropriate

A. speed

B. power factor

C. current rating

D. voltage rating

11. The motor used in an electric clock is the

A. synchronous motor

B. induction motor

C. universal motor

D. shunt motor

12. Reversal of rotation of d.c. motor is achieved by

A. adjusting the commutator

B. reversing the armature connection

C. reversing the shunt field

D. reversing the series field

13. The power factor of a single-phase induction motor s usually

A. greater than unity

B. unity

C. lagging

D. always leading

14. The induction motor differs from other types of a. c. motors because of its
A. slip-rings
B. slip speed
C. synchronous speed
D. supply frequency

15. The d.c. generator works on the principle of
A. Lenz's law
B. Fleming's left-hand rule
C. Faraday's law
D. Fleming's right-hand rule

16. The field resistance in a d.c. sunt generator determines the
A. field current
B. armature current
C. terminal voltage
D. e.m.f. at starting

17. An a.c. generator with 4-poles is required to generate an e.m.f. with frequency of 60Hz. The speed of the rotor is
A. 3600 rpm
B. 1800 rpm
C. 900 rpm
D. 240 rpm

18. The protective device employed to clear overload current in domestic installation is
A. one-way switch
B. two-way switch
C. rewireable fuse
D. free extinguisher

19. Isolators can be classified as high voltage
A. switches
B. reactor
C. busbars
D. circuit breakers

20. The process of introducing an impure atom into a semiconductor to enhance conduction is referred as
A. rectification
B. biasing
C. doping
D. clamping

21. A logic gate is an electronic circuit which
A. does not work on binary numbers
B. makes a logic decision
C. does not alternate between 0 and 1
D. allows electron flow only in one direction

22. The semiconductor device used for clamping electronic signal is the
- A. thyristor
- B. triac
- C. thermistor
- D. diode

23. The two examples of acceptor atoms are
- A. boron and arsenic
- B. antimony and phosphorous
- C. antimony and aluminum
- D. boron and aluminum

24. Installation test are carried out in the following sequence
- I. Insulation test
- II. Polarity test
- III. Earthing test

- A. I, II, and III
- B. I, III and II
- C. II, I and III
- D. II, III and I

25. The maximum number of socket outlets which may be connected in a ring circuit depends on the
- A. circuit voltage
- B. number of spurs
- C. length of the ring
- D. circuit current

26. Polarization in a dry cell implies
- A. gassing by the cell
- B. formation of gas bubbles on the positive electrodes
- C. neutralization of positive ions
- D. ionization

27. The power plant of a generator coupled with a steam turbine is known as
- A. Thermal power plant
- B. Hydropower plant
- C. Atomic power plant
- D. Wind power plant

28. Chemical energy is converted to electrical energy by means of
- A. battery
- B. solar cell
- C. thermocouple
- D. d.c. generator

29. Any closed path within a circuit network is called
- A. branch
- B. junction
- C. node
- D. loop

30. Which of the following factors does not affect the resistance of a conductor?
- A. type of material of the conductor
- B. cross-sectional area of the conductor
- C. weight of the conductor
- D. length of the conductor

31. Leclanche' cell is called a primary cell because it
- A. cannot be used continuously
- B. cannot supply high voltage and current
- C. has high internal resistance
- D. cannot be recharged

32. A current of 10A flowing through a circuit for 12 seconds produces a charge of
- A. 0.8C
- B. 1.2C
- C. 2.0C
- D. 120.0C

33. A 480V d.c. motor of armature resistance 0.15Ω takes a current of 120A. calculate the e.m.f generated
- A. 18V
- B. 462V
- C. 480V
- D. 498V

34. The material below which has the least reluctance is
- A. brass
- B. air
- C. zinc
- D. aluminum

35. The inductance reactance of the circuit in figure x, below is

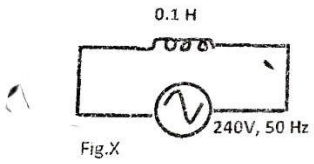


Fig.X

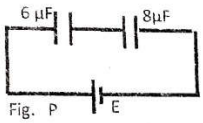


Fig. P

- A. 0.032Ω
- B. 31.415Ω
- C. 150.800Ω
- D. 314.159Ω

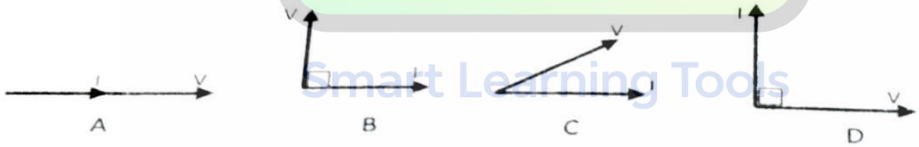
36. The resultant capacitance of the circuit in fig. p is
- A. 0.252μF
- B. 2.000μF
- C. 3.429μF
- D. 14.000μF

37. The capacitance of a parallel plate capacitor is affected by
- A. nature of the dielectric
- B. frequency of the supply voltage
- C. the source of power supply
- D. conductivity of the plates

38. A short flexible conduit is employed when insulating
- A. a distribution board
- B. an electric fan
- C. an electric motor
- D. a refrigerator

39. At resonance frequency in R-L-C series, the relationship between impedance(Z) and resistance(R) is
- A. $Z = R$
- B. $Z = R^2$
- C. $Z > R$
- D. $Z < R$

40. Which of the following phasor diagrams represents the phase relationship between voltage and current applied to a pure inductor?



41. In a.c. circuits, apparent power VA, is the
- A. true power
- B. phasor sum of true power and total power
- C. reactive power
- D. phasor sum of reactive power and true power

42. The secondary power in a 50VA, 240/25V transformer is
- A. 0.21 A
- B. 0.50 A
- C. 2.00 A
- D. 4.80 A

43. The power consumed by 10Ω resistor connected across a 240 V supply is
- A. 2.40KW
- B. 5.78KW
- C. 2.00KW
- D. 57.60KW

Use the information below to answer questions 44 and 45.

An electric pressing iron having a resistive element of 40Ω is connected across a 230 V supply.

44. The current that will flow this element is

A. 270.000A
B. 190.000 A
C. 5.750 A
D. 0.174 A

45. The power comsumed by the element is

A. 0.04KW
B. 1.32KW
C. 7.60KW
D. 9.20KW

46. Whch of the following materials is an insulator?

A. ceramic
B. platinum
C. brass
D. bronze

47. Bus-bar trunking is used in

A. clear system of wiring
B. underground wiring
C. overhead wiring
D. high rise wiring

48. In a star connected load, phase voltage equals

A. line voltage
B. line voltage on square root of three
C. twice the line voltage
D. half the line voltage

49. A high value resistor connected in series with a moving-coil measuring instrument is called a

A. multiplier
B. rheostat
C. shunt
D. potentiometer

50. Power consumption in domestic installations is measued using

A. an ohmeter
B. an ampere-hour meter
C. a kilowatt-hour meter
D. a wattmeter

END OF THE PAPER