

2023 MOCK 2 APPLIED ELECTRICITY 1

PAPER 1

1 hour

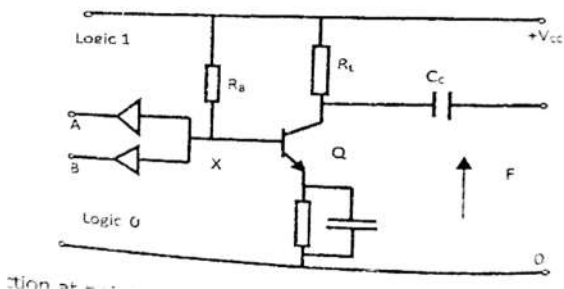
[50 marks]

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.

- When a good p n junction diode is tested, the correct result is
 - Low resistance in both direction
 - High resistance in the both direction
 - High resistance in the one direction and low resistance in the other direction.
 - No resistance in either direction.
- The number of grids in a pentode thermionic valve is
 - Two
 - Three
 - Four
 - Five
- The effect of low power factor is caused by a / an
 - Inductive circuit
 - transistorized circuit
 - Capacitive circuit
 - Resistive circuit.

The figure is a diode –transistor logic circuit . use it to answer question 4 and 5



- The logic function at point x is
 - A+ B
 - A.B
 - $\overline{A + B}$

D. $\overline{A.B}$

- The output function F is

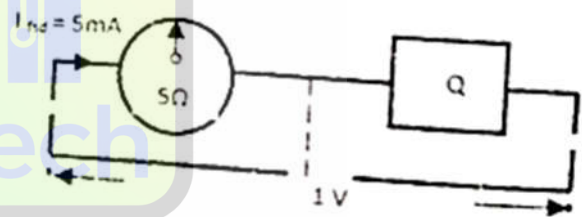
A. $\overline{A + B}$

B. $\overline{A.B}$

C. A+B

D. A.B

the figure below is an adapted moving –coil instrument. Use it to answer question 6 to 8



- The part labelled Q is known as a

A. rheostat

B. Shunt

C. Potentiometer

D. Multiplier

- The value of Q is

A. 20Ω

B. 200Ω

C. 196Ω

D. 5Ω

- The figure above represents a/an

A. Ohmmeter

B. Voltmeter

C. Ammeter

D. Wattmeter

- The shell-type transformer has

A. Magnitude

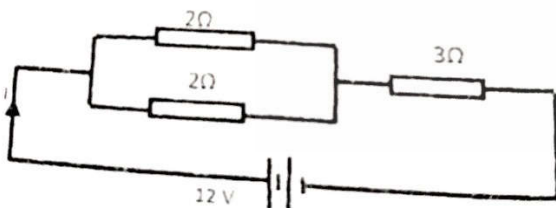
B. two limbs

- C. three limbs
D. four limbs
10. The synchronous speed of a 50Hz, 10 pole is
A. 300r.p.m
B. 500r.p.m
C. 600r.p.m
D. 1200r.p.m
11. The purpose of choke in a florescent lamp circuit is to
A. improve the power factor
B. provide high initial starting voltage
C. increase the brightness of the lamp
D. limit the starting current
12. An a.c supply voltage of 240V r.m.s has a peak value of
A. 168.5V
B. 169.7V
C. 240V
D. 339.4V

13. The efficiency of a transformer is expressed as

- A. $\frac{\text{output} + \text{loses}}{\text{input}} \times 100\%$
B. $\frac{\text{input}}{\text{output}} \times 100\%$
C. $\left(\frac{-\text{loses}}{\text{output}}\right) 100\%$
D. $\frac{(1 - \text{loses})}{\text{input}} \times 100\%$

Use the figure to answer question 14 to 16



14. The effective resistance of the circuit is

- A. 7.0Ω
B. 5.0Ω
C. 4.0Ω
D. 1.3Ω

15. The current I in the circuit is

- A. 7A
B. 2.4A
C. 3.0A
D. 9.3A

16. The power dissipates in the 3Ω resistor

- A. 8.67w
B. 17.28W
C. 27.00W
D. 259.50

17. The speed of the universal motor is

- A. Independent on frequency of supply
B. independent of frequency of supply
C. proportion of frequency of supply
D. inversely proportion to frequency of supply

18. ne major disadvantage of the half –wave rectifier is that

- A. It is very expensive
B. The output is in on direction only.
C. It uses one diode only
D. The output voltage is zero for half of the cycle

19. Which of the following is not part of a d.c. generator

- A. Armature
B. Shaft
C. Commutator
D. slip-ring

20. The ratio of the input signal frequency to output frequency of a half-wave rectifier is

- A. 1.2
B. $\sqrt{2}:1$
C. 1:1
D. $1:\sqrt{2}$

21. The unit of permittivity is

- A. farad per metre
B. farad
C. coulomb per metre
D. coulomb

22. The main function of a d.c motor starter is to

- A. reduce supply voltage
B. reduce starting current
C. increase supply voltage
D. increasing starting current

23. Which of the following characteristic has negative effect on measuring instrument

- A. Gravity control
B. Eddy current damping
C. Air dashpot damping
D. Ambient temperature

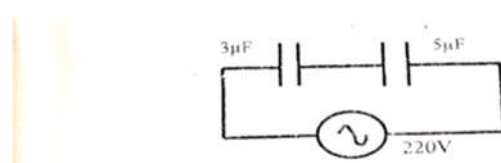
24. The impedance of a series RL circuit having 3Ω resistance and 4Ω inductive reactance is

- A. 1Ω

- B. 5Ω
 C. 7Ω
 D. 12Ω
25. The primary source of energy in a steam power station are
- Air
 - Water
 - diesel
 - Uranium
- A. I and II only
 B. I and III only
 C. II and III only
 D. III and VI only
26. A digit of a binary number is
- word
 - character
 - pulse
 - bit
27. A 480V d.c motor of armature resistance 0.15Ω take a current of 120A. Calculate the e.m.f generated
- 18V
 - 462V
 - 480V
 - 498V
28. Which of these does not affect the current-carry capacity a conductor?
- cross-sectional area of the conductor
 - The number of strands
 - The diameter
 - Type of insulation
29. A 50 KVA transformer having secondary output voltage of 400 V will deliver a second currency current of
- $125 \times 10^{10} \text{ }^{-3} \text{ A}$
 - $125 \times 10^{-3} \text{ A}$
 - 8A
 - 25A A
30. The direction of movement of a current-carrying conductor that is situated in a magnetic field can be determined using
- Fleming's left Hand Rule
 - Fleming's Right Hand Rule
 - Faraday's law
 - Corkscrew Rule
31. A coil of 100 turn with length 500m, allow a current of 2 A through it. The magnetizing force is
- 500mm ampere –turn /metre

- 400 ampere –turn / metre
 - 200mm ampere- turn /metre
 - 100 ampere –turn / metre
32. The logic gate that has 1 as output only when all input are at logic 1 is a /an
- OR gate
 - XOR gate
 - AND gate
 - Rectification
33. Which of the following is not an application of a diode
- Amplification
 - Switching
 - Clipping
 - Rectification
34. In a thermionic valve, the negative space charge is form of electron emitted from the
- anode
 - cathode
 - screen
 - control grid
35. A common –emitter configuration has
- zero output impedance
 - infinite input impedance
 - high current gain
 - unity current gain
36. The thermionic diode is a valve containing
- one electron
 - p.v.c sheathed
 - rubber sheathed
 - lead sheathed
37. The purpose of laminating the core of a transformer to minimize loss
- vibration
 - copper
 - hysteresis
 - eddy current

Figure 4 show two capacitor connected in series across a 220V supply. Use it to answer question 38 to 40.



38. The total capacitance of the circuit is
- $2\mu f$
 - $3\mu f$

- C. $9\mu f$
D. $1.89\mu f$
39. The total charge through the circuit is
A. $4409\mu C$
B. $660\mu C$
C. $1980\mu C$
D. $412.5\mu C$
40. The voltage across the $3\mu f$ capacitor is
A. 73.3V
B. 110.0V
C. 137.5
D. 82.5V
41. A wider bandwidth required for
A. A.M transmission
B. F.M transmission
C. M.W transmission
D. S.W transmission
42. A radio station broadcast on frequency of 1170KHz. Calculate its operation wavelength
A. 256.3M
B. 585.0M
C. 1170.0M
D. 3900.0M
43. The peak- to- value of a sinusoidal waveform is
A. $0.637 \times$ peak value
B. $0.707 \times$ peak value
C. $1.110 \times$ peak value
D. $2.00 \times$ peak value
44. A reduction in the voltage across the armature of a d.c motor
A. reduces the speed of the motor
B. increases the speed of the motor
C. reduces the current
D. increases the current in the circuit
45. The d.c. motor draw a large current at starting because the
A. load is high
B. field resistance is high
C. back e.m.f. is zero
D. back e.m.f is high
46. An increase in the distance between the parallel plate of capacitor
A. decreases the capacitance
B. increases the capacitance
C. decreases the permittivity
D. increases the permittivity
47. The Y-plate of a cathode ray tube is for
A. focusing of the beam
B. vertical of the beam
C. horizontal deflection of the beam
D. horizontal and vertical deflection of the beam
48. The control grid in a triode is located
A. above the anode
B. near the anode
C. between the anode and cathode
D. between the heater and cathode
- The figure below shows a process of modulating a high frequency of high signal. Use it to answer question 49 and 50.
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49. The modulating technique employed is
A. Angle of modulation
B. Phase modulation
C. Amplitude modulation
D. Frequency Modulation
50. The modulating index of the modulated signal is
A. 0.20
B. 0.25
C. 0.60
D. 1.00

END OF PAPER