UG 5th Semester Examination 2021

PHYSICS (Honours)

Paper Code : SEC-1

[CBCS]

**Full Marks : 40**   **Time : Two Hours**

The figures in the margin indicate full marks.
Candidates are required to give their answers in their own words as far as practicable.

Attempt all questions. Each question carries 2 marks.

1. Which of the following instruments will be used to measure alternating current?
   (A) Moving iron voltmeter
   (B) Permanent magnet type ammeter
   (C) Induction type ammeter
   (D) Moving iron ammeter

2. The internal resistance of an accurate voltmeter should be
   (A) As low as possible
   (B) Low
   (C) Negligible
   (D) Very high

3. High current of the order of 100 A can be measured by an ammeter of 0-1A rating by using
   (A) Shunt
   (B) Capacitor
   (C) R-C network
   (D) Current transformer

4. An inductive circuit of resistance 2 ohm, inductance 0.5 H is connected to a 250 volt-50 Hz supply. What capacitance will be placed in parallel to produce resonance?
   (A) 700 micro-Farad
   (B) 750 micro-Farad
   (C) 701 micro-Farad
   (D) 714 micro-Farad

5. A passive network
   (A) Has no current source
   (B) Has no diode or transistor.
   (C) Has e.m.f source
   (D) Has both e.m.f and current source

6. What is represented by the electrical symbol ⟶▷⊢ ? Choose the correct answer.
   (A) Diode
   (B) Transistor
   (C) Inductor
   (D) Transformer

7. The maximum flux density in the core of a $250/3000$ –volts, $50 - Hz$ single-phase transformer is $1.2\ Wb/m^2$. If e.m.f per turn is $8\ volt$, determine area of the core.
   (A) $0.03\ m^2$
   (B) $0.04\ m^2$
   (C) $0.06\ m^2$
   (D) $0.07\ m^2$

8. At very low frequencies a series R-C circuit behaves as
   (A) Resistive
   (B) Inductive
   (C) Capacitive
   (D) None of these

9. Which of the following transformers will not serve its purpose when its secondary is open circuited.
   (A) Current transformer
   (B) Voltage transformer
   (C) Power transformer
   (D) None of the above

10. 220 volt DC source is applied to the primary coil of a transformer. If number of turns of primary and secondary coils are **N** and **2N** respectively , induced emf in secondary coil is
    (A) Zero volt
    (B) 440 volt
    (C) 220 volt
    (D) 110 volt

11. The device that converts electrical energy into mechanical energy is
    (A) AC generator
    (B) DC generator
    (C) Cell
    (D) DC motor

12. Alternating current(AC) generator is basically based upon
    (A) Ampere's law
    (B) Lenz's law
    (C) Faraday's law
    (D) Coulomb's law

13. An electric motor uses the phenomena of
    (A) Heating effect
    (B) Electromagnetic induction
    (C) Magnetic effect of current
    (D) None of these

14. In a three phase AC circuit , power is measured using
    (A) Potentiometer
    (B) Wattmeter
    (C) Galvanometer
    (D) Ammeter

15. For a three phase, three wire system, two wattmeters read 4000 Watt and 2000 Watt respectively. The power factor, when both meters give rated reading, is
    (A) 1.000
    (B) 0.500
    (C) 0.866
    (D) 0.600

16. The most common application of PN junction diode is
    (A) Filter
    (B) Rectifier
    (C) Amplifier
    (D) Oscillator

17. The maximum efficiency of half wave rectifier diode is
    (A) 70.7 %
    (B) 81. 2%
    (C) 60.9%
    (D) 40.6%

18. A circuit breaker is
    (A) Power factor correcting device
    (B) A device to neutralize the effect of transient
    (C) A waveform correcting device
    (D) A current interrupting device

19. If a 1 ohm, 2 ohm and $\frac{32}{3}$ ohm resistors are connected in star, find the equivalent resistance for delta connection.
    (A) 34 ohm, 18.67 ohm, 3.19 ohm
    (B) 33 ohm, 18.67 ohm, 3.19 ohm
    (C) 33 ohm, 19.67 ohm, 3.19 ohm
    (D) 34 ohm, 19.67 ohm, 3.19 ohm

20. Star connection is known as
    (A) Mesh connection
    (B) Y connection
    (C) Both of above
    (D) None of above