219

III

Total No. of Questions : 21
Total No. of Printed Pages : 3

Regd. No.

Part - III
PHYSICS, Paper - II
(English version)

Time : 3 Hours] ***[Max. Marks : 60***

SECTION - A **10×2=20**

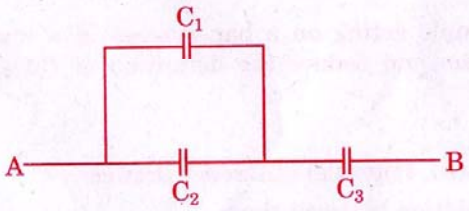
Note : *(i) Answer **all** the questions.*

*(ii) Each question carries **2** marks.*

(iii) All are very short answer type questions.

1. Write any two properties of Para magnetic materials.

2. Calculate the equivalent capacitance between A and B with $C_1 = 10\ \mu F$, $C_2 = 5\mu F$, $C_3 = 4\mu F$ connected in the circuit as shown in the figure.



3. Define Peltier effect and Thomson effect.

4. In a thermo-couple the cold junction is at 20°C and the inversion temperature is 520°C. Calculate the neutral temperature.

5. Define Self induction and Mutual induction.

6. A Galvanometer has a resistance of 400 Ω. Calculate the required value of Shunt so that its sensitivity is to be reduced by $\frac{1}{50}$ times.

7. What are the importance of Moseley's law ?

8. How is a battery connected to a Junction diode in forward-bias and reverse-bias ?

9. Draw the circuit symbols for p-n-p and n-p-n transistors.

10. Define Modulation. Why is it necessary ?

SECTION - B

6×4=24

Note : *(i) Answer **ANY SIX** of the following questions.*
*(ii) Every question carries **four** marks.*
(iii) All are short answer type questions.

11. Describe the construction and working of an Optical fibre with neat diagram. State its uses.

12. Mention any four applications of Diffraction.

13. Derive the equation for the couple acting on a bar magnet in a uniform magnetic field with neat diagram and deduce the definition of "Magnetic Moment".

14. Define Intensity of electric field (E), Potential difference between two points (V), and derive the relation between them.

15. Derive the balancing condition of a Wheatstone bridge with neat diagram.

16. A wire carries a current of 1A, then
    (a) How much charge flows through the wire in 5 minutes ?
    (b) How much electrons will cross over a particular point in the conductor during this period ?

17. Write the laws of Photo Electric effect.

The work function of a material is 3 eV. It is illuminated by a light of wave length 3×10^{-7} m. Calculate the threshold frequency.
($h = 6.63 \times 10^{-34}$ J.s.)

18. Write the working of a full wave rectifier with neat diagram.

SECTION - C

2×8=16

Note : *(i) Answer **ANY TWO** of the following questions.*

*(ii) Each question carries **Eight** marks.*

(iii) All are long answer type questions.

19. Derive the equations for the frequencies of the harmonics and overtones produced in an open pipe.

What is the "End correction" ? Explain the importance of beats.

20. Describe tangent Galvanometer with necessary theory and neat diagram.

A rectangular coil of wire of 500 turns of area 10×5 cm^2 carries a current of 2A in a magnetic induction of 2×10^{-3} T. If the plane of the coil is *(a)* parallel to the field, *(b)* makes an angle 30° to the field, calculate the torque on the coil.

21. Explain the principle and working of a nuclear reactor with the help of a labelled diagram.

What is the role of a moderator in a nuclear reactor ?

The half-life of Radium is 1600 years. Calculate its average life.