

STELLA MARIS COLLEGE (AUTONOMOUS) CHENNAI – 600 086.
(For candidates admitted during the academic year 2004-05 & thereafter)

SUBJECT CODE : **PH/AC/GP22**

B.Sc. DEGREE EXAMINATION APRIL 2007
BRANCH IV - CHEMISTRY
FOURTH SEMESTER

COURSE : **ALLIED – CORE**
PAPER : **GENERAL PHYSICS – II**
TIME : **2 HOURS** MAX. MARKS : 70

SECTION - B

ANSWER ANY FIVE QUESTIONS: (5 x 6 = 30)

1. A condenser charged to 2V is discharged through a BG, when the corrected throw is 8.6cms and the current sensitivity is 2×10^{-8} amp/cm and period 10 sec. Find the capacity of the condenser.
2. A standard capacitor of capacitance $0.1 \mu\text{F}$ is charged by a potential difference of 2V. It is then discharged through a ballistic galvanometer, which gives a linear throw of 20cm on a scale at a distance of 1m from the mirror of BG. Calculate the charge sensitiveness of the galvanometer.
3. A monochromatic light of wavelength $656 \times 10^{-9}\text{nm}$ is incident on a plane transmission grating of width 2cm. If the first order spectrum is formed at $18^\circ 14'$. Find the total number of lines in the grating.
4. Newton's rings are formed between a plane glass plate and a convex lens. The radii of the 5th and 25th rings are 1.5mm and 4mm. Calculate the wavelength of light if the radius of curvature of the surface of the lens is 1 metre.
5. A diode with internal resistance $R_f = 20 \text{ ohm}$ is used for half wave rectification. If the applied voltage $v = 50 \sin \omega t$ and load resistance $R_L = 800 \text{ ohm}$, calculate the values of I_m , I_{rms} and I_{dc} .
6. A transistor has $I_B = 105 \mu\text{A}$ and $I_C = 2.05\text{mA}$. Find β , α and I_E .
7. Prove that, $(A+B)(A+C) = A + BC$.

SECTION - C

ANSWER ANY TWO QUESTIONS: (2 x 20 = 40)

8. a) State and prove Gauss's law. (8)
b) Give the construction of a moving coil ballistic galvanometer. Derive an expression for the quantity of charge flowing through it. (12)

9. a) What is meant by chromatic aberration? (4)
- b) Find the condition for the achromatism of two thin lenses mounted coaxially when (i) they are in contact and (ii) separated by a distance. (16)
10. a) Explain, how zener diode can be used as a voltage regulator. (5)
- b) Discuss the characteristics of a transistor in CE mode with necessary circuit and curves. (8)
- c) State and prove DeMorgans theorem. (7)
11. Write a note on
- a) Electric field at a point outside a charged sphere. (6)
- b) Construction and working of a refracting astronomical telescope. (7)
- c) Full wave rectifier. (7)

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