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

SUBJECT CODE : PH/AC/GP42

B.Sc. DEGREE EXAMINATION APRIL 2008
BRANCH IV - CHEMISTRY
FOURTH SEMESTER

REG. No._____

COURSE : ALLIED – CORE
PAPER : GENERAL PHYSICS – II
TIME : 30 MINS. **MAX. MARKS : 30**

SECTION - A

TO BE ANSWERED IN THE QUESTION PAPER ITSELF

ANSWER ALL QUESTIONS: **(30 x 1 = 30)**

I CHOOSE THE CORRECT ANSWER:

1. Which of the following is a vector quantity
   a) electric field strength b) electric charge c) electric potential

2. The charge of the electron is
   a) negative b) positive c) zero d) ten coulomb

3. The unit of electric field intensity is
   a) N/C b) N/m c) volt/metre

4. Which one is not a dielectric
   a) paper b) Mica c) Copper

5. The charge is given by
   a) $q = cV$ b) $V = qc$ c) $V = cqV_1$

6. Hysterisis gives
   a) loss of energy per unit cycle. b) gain of energy c) neither loss nor gain.

7. Maser represents
   a) Microwave amplification stimulated emission by radiation
   b) Microwave stimulated emission on by red emission
   c) Microwave oven

8. Population inversion means
   a) Number of atoms in low energy state is more than number of atoms in higher energy state.
   b) Number of atoms in higher energy state is less than number of atoms in lower energy state.
   c) Number of atoms in lower energy and higher energy are equal.

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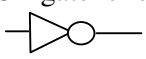
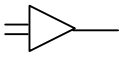
9. The resistance of a semiconductor _____ with rise in temperature.
   a) increases b) decreases c) does not change

10. In a p type semiconductor the current conduction is by _____.
   a) holes b) electron c) ions

11. The input impedance of a transistor is measured in _____.
   a) ohm b) mho c) ampere

12. Zener diode when used in a circuit is always _____.
   a) forward biased b) reverse biased c) does not require bios

13. NOT gate is represented by
   a)  b)  c) 

14. Lorentz force is given by _____
   a) $F = q(E + v \times B)$ b) $F = qvB$ c) $F = qE$

15. Gauss law is $\oint E.ds = \frac{\quad}{\varepsilon_0}$.
   a) ρ b) η c) q

II FILL IN THE BLANKS:

16. Rectifier constant _____ to _____.

17. $I_e = I_b +$ _____.

18. $t + 273^0 C = (\quad)$.

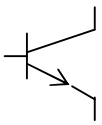
19. Ones complement of 1011 is _____.

20. $\overline{A + B} =$

III STATE WHETHER TRUE OR FALSE:

21. Capacitor is a passive device.

22. Lorentz force is $q \times \left(\vec{v} \times \vec{B} \right)$

23.  is a common emitter transistor.

24. The dimension of work is ML^2T^{-2}.

25. Electrical flux is number of lines of force.

IV ANSWER THE FOLLOWING:

26. Define electric field strength.

27. State Maxwell's equation.

28. What is hysterisis?

29. Give 2 uses of Laser.

30. Convert decimal number 63 to its equivalent binary number.

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SECTION – B

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

1. Three capacitors 2 μ fd, 3 μ fd, 4 μ fd are connected in a) series b) parallel. Find the effective capacitance.

2. The constant α of a transistor is 0.95. What would be the change in the collector current corresponding to change of 0.4mA in the base current in a common emitter arrangement?

3. a) Add: 1011 + 1111 b) Subtract 1001 from 1100
   c) Multiply 1011 × 101

4. The capacitance of capacitor is C = 0 .1 μ fd and V = 2 volt, find the charge stored in the capacitor.

5. State and verify De Morgan's theorem.

6. Explain Holography.

7. Obtain expression for force on a current carrying conductor in a magnetic field.

SECTION – C

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

8. a) Prove Gauss law in electrostatics. Apply Gauss law to determine field due to spherical charge.
   b) Obtain an expression for capacity of parallel plate capacitor.

9. Explain the principle, characteristics and application of Fiber optics.

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10. a) With the help of circuit diagram explain the characteristics of transistor in common base mode.
    b) Derive expressions for (i) current amplification factor
    (ii) relation between α and β
    (iii) Collector current

11. a) Explain the working of various types of rectifiers.
    b) Compare the efficiency and ripple factor of different types of rectifiers.

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