

B.Sc. DEGREE EXAMINATION APRIL 2010

BRANCH IV – CHEMISTRY

SECOND SEMESTER

REG. No. _____

COURSE : **ALLIED – CORE**

PAPER : **PHYSICS FOR CHEMISTRY – 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. In Maxwells equation $\nabla \cdot D$ is equal to
a) ϵE b) E c) E
2. A capacitor consists of parallel plates filled with
a) Dielectric b) Air c) Mica
3. Iron is a
a) Paramagnet b) Diamagnet c) Ferromagnet
4. The charge of electron is
a) negative b) positive c) neutral
5. Hysteresis gives
a) loss of energy per unit cycle b) gain of energy
c) neither loss or gain
6. The energy equation is
a) $E = h\nu$ b) $E = h$ c) $E = h/\nu$
7. The susceptibility of a paramagnetic substance is
a) positive b) Zero c) negative
8. In Boolean Algebra A.B. represents
a) A and B b) A or B c) A complement B
9. In an OR Gate
a) $0+1=1$ b) $1+1=1$ c) $0+1=0$
10. Force on a charged conductor in a magnetic field is
a) BqV b) BiI c) Bq
11. Electric field is a _____ quantity.
a) scalar b) vector c) tensor

12. Lorentz force is given by
 a) $F=qE+B$ b) $F=qE+VqV$ c) $F=qE-BqV$
13. As the distance between charges increase the field
 a) increases b) decreases c) remains the same
14. In population inversion
 a) $N_1=N_2$ b) $N_1> N_2$ c) $N_1<N_2$
15. 1011-101
 a) 101 b) 111 c) 110

II **FILL IN THE BLANKS:**

16. The charge of proton is _____
17. Op amp is called _____
18. Copper is a _____
19. Laser represent _____
20. A.B is an _____ gate

III **STATE WHETHER TRUE OR FALSE:**

21. In an inverting amplifier the input and output are in phase.
22. Electric potential is a scalar quantity.
23. The unit of capacitance is farad.
24. The figure of merit of B.G is called charge sensitivity.
25. Fibre optics follow total internal reflection principle.

VI **ANSWER THE FOLLOWING:**

26. State Gauss law in electrostatics.
27. State ohms law
28. What is a laser
29. Give Truth Table and symbol for AND gate.
30. What is frequency response of amplifier.

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TIME : **2 HOURS** MAX. MARKS : 70

SECTION – B

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

1. Explain a capacitor Discuss parallel plate capacitor with and without dielectric.
2. Discuss holography, its principles and applications
3. What are number system. Explain Decimal to binary and binary to Decimal number system.
4. Explain hysteresis loop of a magnet.
5. For the inverting feedback amplifier, $R_1 = 0.1 \text{ M } \Omega$ $R_f = 0.5 \text{ M } \Omega$ and an open loop gain $A = 8 \times 10^4$. If the input voltage is 40mv, find the output voltage.
6. Three capacitors $2 \mu\text{F}$, $3\mu\text{F}$, and $4\mu\text{F}$ are connected in a) series b) parallel. Find the effective capacitance.
7. Compute the magnetic force on a wire 1m long and carrying a current of 10 A when placed in a uniform field of magnetic induction 1.5 Wb/m^2 making an angle 30° with the direction of the field.

SECTION – C

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

8. State coulombs Inverse square law using gauss law calculate field due to
 - a) Point charge
 - b) Spherical charge
 - c) Cylindrical charge distribution
9. Explain laser action. Discuss working of CO_2 laser.

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10. What are op-amps. Discuss

a) Inverting b) Non - Inverting c) summing and difference amplifier.

11. Give the construction of moving coil ballistic galvanometer. Obtain expression for charge flowing through it.
