PHYSICS
QUESTION BANK
2012-2013

UNIT-I-Electrostatics

1. State Coulomb Law.
2. Define Coulomb Law.
3. What is mean electric field strength?
4. Write three properties of electric force line of & what is the unit of its?
5. What is an electric dipole? Give example.
6. What is torque on electric dipole and its unit?
7. Explain the working principle of microwave oven?
8. What is potential at point?
9. What is equipotential surface?
10. What is electric flux?
11. State Gauss law
12. Why is it safer to be inside a car than standing under the tree during lighting?
13. What is capacitor? Define capacitance.
14. Differentiate the dielectric and electric polarized molecule
15. What is electric polarization?
16. Give the uses of capacitor?
17. What is mean by action of points & lightening conductance?

UNIT-II -Electricity

1. What is drift velocity?
2. What is mobility?
3. State Ohms Law.
4. Define temperature coefficient of resistance.
5. What is superconductivity?
6. Write Kirchoff's Laws?
7. What is transition temperature (or) critical temperature?
8. What is a change in conductor at transition temperature?
9. Differentiate electric power and electric energy
10. Differentiate between electro motive force & electric potential difference?
11. Define specific resistivity & its unit?
12. What are the usages of secondary battery?
13. Uses of super conductors?
14. State Faraday's electrolysis Laws.
15. Why the copper wire does not use in voltmeter?

UNIT-III - Effects of Electric Current

1. What is the reason for uses of nichrome in electric heating devices?
2. Define Peltier effect.
3. Define ampere circuit Law.
4. What are the limits of cyclotron?
5. State Fleming left hand role
6. Define ampere due to force?

UNIT-IV-Magnetic Induction &Alternative Current

1. Write the Faraday's Laws for electro magnetic induction
2. State Fleming's right hand role.
3. What are the methods for produced induced emf?
4. Define Quality factor

5. State Lenz Law

UNIT-V-Electro Magnetic Waves, Wave Optics

1. What is tyndal scattering
2. What is the reason for sky appears blue in colour?
3. State Brewster's Law.
4. What is optical axis?
5. What are the uses of infrared rays?
6. What is band width?
7. What is emission spectrum & absorption spectrum?
8. Define specific rotation.
9. Differentiate between Fresnal & Fraunhofer diffraction effect?
10. Explain Huygen's principle.
11. What are the conditions for getting the bright fringes?

UNIT-VI-Atomic Physics

1. What is principle of Milliken's oil drop experiment?
2. Define ionization potential.
3. Differentiate soft x-rays and hard x-rays.
4. What are the suggestions given by result of Lave's experiment?
5. State Bragg's Law.
6. State Moseley's Law.
7. Given the specific characteristics of laser.
8. What are the conditions need for laser action
9. What are the medical uses of lasers?
10. State the postulates of Bohr atom model.

UNIT-VII-Dual Nature Of Radiation And Matter And Relativity

1. What is photo electric effect
2. Define stopping potential
3. Define threshold frequency
4. What is the photo electric emission energy?
5. What is meant by photo electric cell & what are the types in its?
6. What are the limitations of electron microscope?
7. What are the applications of electron microscope?
8. What is inertial frame & non-inertial frames?
9. State the postulates of special theory of relativity?
10. Define frame reference.

UNIT-VIII-Nuclear Physics

1. What is an isotope?
2. What is binding energy
3. What is radiation?
4. What is α decay?
5. What is half life period?
6. What is mean life period?
7. Define curie.
8. What is radio activity?
9. What is artificial radio activity?
10. Define Rontgen?
11. What is breeder reactor?
12. What are the uses of atomic nuclear reactors?
13. What is mean by cosmic rays?

14. What is meant by pair production and annihilation of matter?
15. Define lepton.

UNIT IX -Semiconductor Devices and Their Applications

1) What is meant by intrinsic semi conductor?
2) What is meant by rectification?
3) What are the advantages of negative feed back?
4) What is the Barkhausen condition for oscillation 1?
5) What is meant by Integrated circuit?
6) Write advantages of integrated circuits.
7) State Demorgan's Law.
8) Write the important characteristics of operational amplifier.
9) What are the uses of CRO?
10) What are the gates are called as universal gates?
11) What is meant by extrinsic semiconductor?
12) What is meant by amplification band width?
13) What is meant by doping?

UNIT X-Communication System

1) What is meant by wavelength?
2) Define modulation index.
3) What is meant by amplitude modulation?
4) What is meant by frequency modulation?
5) What are the advantages of amplitude modulation?

PROBLEMS:

1) The resistance of a nichrome wire at 0^0 C. If its temperature coefficient of resistance is $0.004/^0$C, find the resistance at boiling point of water comment on the result.
2) The two equal length conductors which are made by same metal, their resistance values like 5 ohm & 10 ohm. Find out the conductors radius ratio.
3) An aircraft having a wingspan of 20.48 m flies due north at a speed of 40 ms^{-1}. If the vertical component of earth's magnetic field at the place is $2X\ 10^{-5}$, Calculate the emf induced between the ends of the wings.
4) Calculate the mutual inductance between two coils when a current of 4 A changing to 8 A in 0.5 s in the coil , induces an emf of 50mV in the other coil. Data: I=4A, I_2= 8A, dt=0.5sec, e= 50 mV, find out the mutual inductance.
5) A 300 mm long tube containing 60cc of sugar solution produces a rotation of 9^0 when placed in a polarimeter. If the specific rotation is 60^0, calculate the quantity of sugar contained in the solution.
6) Calculate the longest wavelength that can be analyzed by a rock crystal of spacing d=2028A^0 in the first order.
7) Find the minimum wavelength of X-rays produced by an X-ray tube at 1000kV.
8) The half life period of redan is 3.8 days, find out the average life period of its.
9) When we give the negative feed back to the amplifier, the gain is reduces from 50 to 25, what is the feed back ratio?
10) Prove: (A+B)(A+C)=A+BC

5 MARKS

UNIT I-Electrostatics

1) What is the property of electric lines of force?

UNIT II-Electricity

1) Compare drifts velocity and current.
2) What are the usages of super conductors?
3) The resistors are connected in series. What is the total resistance?
4) The resistors are connected in parallel. What is the total resistance?

5) Explain about the finding internal resistance of cell by using volt meter.
6) State the Kirchoff's second Law (KVL).
7) Find out the wire resistance by using metre bridge..
8) Derive the condition for balanced state of metre bridge.
9) Explain the principle of voltmeter.
10) Compare the electro motive force of the given battery by using voltmeter.
11) Explain the Faraday's electrolysis first Law.
12) Explain the Faraday's electrolysis second Law.
13) Explain the process of Daniel cell.
14) Explain the process of Leclanche cell.
15) Explain the working process of led acid accumulator.

UNIT III- Effects of Electric Current

1) How to convert galvano meter into an ammeter?
2) How to convert galvano meter into voltmeter?

UNIT IV- Electro Magnetic Inductance and Alternative Current

1) Explain about emf induced by changing the area enclosed by the coil.
2) Explain the losses in transformer & how to reduce it?

UNIT V -Electro Magnetic Waves & Wave Optics

1) Explain the Brewster's Law.
2) Write & Explain the expression for the radius of the n^{th} dark ring.
3) Write the short notes on Nichol prism.
4) Give the short notes on pile of plates.
5) What are the uses of Polaroid?
6) What are the special characteristics of electro magnetic waves?

UNIT VI -Atomic Physics

1) Compare the characteristics of cathode rays and positive (canal) rays & x-rays.
2) State and derive Bragg's law.
3) Explain spectral series of hydrogen.

UNIT-VII-Dual Nature of Radiation and Matter and Relativity

1. Explain Hallwachs experiment
2. Explain effect of intensity of incident radiation on photo electric current
3. Explain effect of potential difference on the photoelectric current
4. Explain effect of frequency of incident radiation on stopping potential
5. Explain the construction & working process of electron microscope.
6. Explain the Laws of photo electric emission.
7. Explain about uses of photoelectric cell.
8. Explain the application of photoelectric cell.
9. Give the expression for de Broglie wavelength of matter waves?
10. Derive the expression for Einstein's photoelectric reaction or effect?
11. Explain length contraction?
12. Explain time dilation?
13. Derive Einstein's mass energy equivalence.

UNIT-VIII-Nuclear Physics

1. Explain the characteristics of nuclear force?
2. Write the property of neutrons?

UNIT-IX-Semiconductor Devices and Their Applications

1. State and explain DeMorgan's Laws
2. Explain the working principle of half-wave rectifier.

UNIT-X-Communication System

1. Explain the principle of radar and its application
2. Explain the advantages & disadvantages of analog communication?
3. Write the application and advantages of fiber optics?

4. Write merits and demerits of satellite communication?

10 MARKS

1. Derive an expression for electric field due to an electric dipole at a point on its axis line
2. Derive an expression for electric field due to an electric dipole at a point along the equatorial line experiments.
3. Drive the expression for electric potential at a point due to an electric dipole
4. Explain capacitance of a parallel plate capacitor using the principle of a capacitor.
5. Derive the expression for the capacitance of a parallel plate capacitor with a dielectric
6. Define gauss law. Using this law explain (1) field due to an infinite long straight charged wire (2) electric field due to an infinite charged plane sheet
7. Find the capacitance of capacitor using series and parallel connection.
8. Explain about construction and working principle of van de graaff generator
9. Discuss the principle and action of a Bain bridge mass spectrometer to determine the isotopic masses?
10. Explain the construction and working of a Geiger Muller counter
11. With the neat sketch , explain the working of a nuclear reactor
12. What is cosmic rays and explain their types & explain altitude and latitude
13. Explain radioactive law of disintegration & half life period.

OTHER QUESTIONS

1) What is the additive nature of electric charge?
2) What is meant by electric lines of force?
3) What is the potential energy due to two electric points?
4) What is meant by potential difference?
5) Define Volt.
6) What is meant by electrostatic shielding?
7) What is meant by electrostatic induction?
8) Define farad.
9) What is meant by dielectric?
10) What is meant by quantization of electric charge?
11) State conservation of electric charge.
12) Differentiate conductor and insulator.
13) Define current density.
14) What is meant by self resistivity& unit?
15) State the faraday's laws of electrolysis.
16) What is meant by internal resistance of cell?
17) Write the principle of volt meter.
18) Define electro chemical equivalent.
19) Differentiate primary cell and secondary cell
20) State tangent law.
21) How to increase the current sensitivity of galvanometer?
22) If increasing the current sensitivity of galvanometer doesn't necessarily, increase the voltage Sensitivity, why?
23) Differentiate peltier effect and joule heat effect.
24) What is meant by transition temperature?
25) What are the draw backs of Rutherford atom model?
26) What is meant by energy level diagram?
27) What is meant by excitation potential?
28) What is meant by excitation potential energy?
29) What is meant by stark effect?
30) What is meant Seebeck effect?
31) What are the draw backs of Sommer field atom model?

32) What is the use of Moseley Law?
33) What are the medical applications of X-rays?
34) What are the industrial applications of X-rays?
35) Short notes on holography,
36) What are the applications of CRO?
37) What is meant by light emitting diode?
38) What is meant by barrier potential difference?
39) What are the methods of doping?
40) What kind of biasing voltage is required to operate the transistor?
41) Draw the CB configuration of NPN transistor.
42) Draw the CE configuration of NPN transistor.
43) Draw the circuit diagram for inverting amplifier.
44) Draw the circuit diagram for non-inverting amplifier.
45) Draw the circuit diagram of summing amplifier.
46) What is meant by isobars?
47) Define atomic mass unit.
48) What is mean by mass defect?
49) What is nuclear force?
50) What is β decay?
51) What is γ decay?
52) Give the radioactive Law of disintegration
53) What is radio active carbon dating?
54) What are the safety rules have to follow by the workers of radiation lab?
55) How to you classify the neutrons based on its kinetic energy?
56) What is artificial transmutation?
57) What is nuclear fusion?
58) What is nuclear fission?
59) What is critical size and mass?
60) What is meson?
61) What is electro magnetic induction?
62) Why the capacitor allows A.C &does not allows D.C?
63) What is eddy current?
64) Give the conditions for sustained interference?
65) What is the reason for black fringe created in center of Newton's rings?
66) What is phase modulation?
67) What is directivity of antenna?
68) What is interlaced scanning?
69) What is use of frequency modulation?
70) What is modulation?
71) What is Fax?
72) What is the importance of modulation?
73) What is modem?
74) What are the uses of analog communication?
75) What are the uses of RADAR?
76) What is synchronizing?
77) What are the methods of radio wave propagation?

5-MARKS

1. Define static potential & derive the expression for potential changes due to a point current
2. The storing energy of parallel capacitor $\frac{q^2}{2C}$ Prove it.
3. What are the characteristics of Lawrence magnetic force?
4. Explain about characteristic x-ray spectra.

5. Draw the block diagram and explain about the AM radio wave transmitter?
6. Derive an expression for the torque acting on the electric dipole when place in the uniform field.
7. What are the uses of eddy current?
8. Derive the expression for self induction of long solenoids?
9. Derive the expression for mutual induction of two long solenoids?
10. Obtain an expression for the current flowing in the circuit containing capacitance only to which an alternating emf is applied. Find the phase relationship between the current and voltage.

10 MARKS

1) Deduce the relationship for the magnetic induction at a point along the axis of a circular coil carrying current.
2) Explain the construction and working of cyclotron.
3) Explain the experiment for prove the Joule Law.
4) Discuss with theory the method of inducing emf in a coil by changing its orientation with respect to the direction of the magnetic field.
5) Explain the principle, construction and working principle of single phase AC generator.
6) A source of alternating emf is connected to a series combination of a resistor R an inductor L and a capacitor C. obtain with the help of a vector diagram and impedance diagram, an expression for (i)the effective voltage (ii) the impedance (iii) the phase relationship between the current and the voltage.
7) Explain emission spectra and Absorption spectra.
8) Derive the expression for the band width of interfacing fringes in young's double slit expression.
9) Describe the– J.J.Thomson method for determining the specific charge of electron.
10) Describe Milikan's oil drop experiment to determine of charge of an electron.
11) Obtain the expression for radius of the n^{th} orbit of a based on Bohr atom theory.
12) Explain the working of Ruby laser with neat sketch.
13) Explain the working of He-Ne LASER with energy level diagram.
14) Sketch the circuit of Colpitt's oscillator and explain it working principle.
15) Explain the functional block diagram of monochrome television receiver.
16) Obtain the expression for the magnetic induction at a Point due to an infinitely long straight conductor carrying current.
17) Deduce an expression for the force on a current carrying conductor placed in a magnetic field.
18) Explain the working process of bridge rectifier.

----------**ALL THE BEST**----------