

VIVEKANANDA COLLEGE, TIRUVEDAKAM WEST - 625234

DEPARTMENT OF PHYSICS

Course Code: 06AT01	Programme: B.Sc.,	CIA: I Test
Date: 27.07.2019	Major: MATHS / CHEMISTRY	Semester: I
Time: 2Hrs	Year: I	Maximum: 50 Marks
Course Title:	ALLIED PHYSICS - I	

SECTION – A

Answer All questions

(10 X 1 = 10 Marks)

- Two Simple Harmonic Motions at right angles to each other with a phase difference produce ____ **CO1**
 a) Beats b) Lissajous Figures c) Chaldnis figures d) Faradays figures
- The maximum displacement of a vibrating particle is called _____ **CO1**
 a) angular velocity b) amplitude c) linear momentum d) oscillation
- Ultrasonic are produced by utilizing **CO1**
 a) Piezoelectric effect b) Peltier effect c) Doppler effect d) Compton effect
- The differential equation representing the S.H.M of a particle is $d^2y/dt^2 + \omega^2y = 0$. The natural frequency of the particle is then given by **CO1**
 a) ω b) $2\pi/\omega$ c) $\omega/2\pi$ d) $2\pi\omega$
- The vibrations of a simple pendulum is a _____ **CO1**
 a) angular type of S.H.M b) Linear type of S.H.M c) both (a) & (b) d) none of the above
- Who first noticed the magnetic effect of electric current? **CO4**
 a) Newton b) Oersted c) Coulomb d) Fleming
- The SI unit of magnetic induction (B) is **CO4**
 a) henry b) tesla c) ampere d) volt
- The current does not pass through the -----circuit **CO4**
 a) Open b) closed c) short d) none of the above
- The circuit breaker has the same action as a **CO4**
 a) fuse b) current c) voltage d) capacitance
- The term MCB stands for **CO4**
 a) Miniature Circuit Breaker b) Miniature Circuit Ball c) Mixing Circuit Breaker d) Miniature Coil Breaker

SECTION – B

Answer any FIVE questions

5 x 2 = 10 Marks

- Define Simple Harmonic Motion. **CO1**
- What do you mean by initial phase? **CO1**
- What are Lissajous figures? **CO1**
- Define Ampere's swimming rule. **CO4**
- What is a relay? **CO4**
- List out the types of electric circuit. **CO4**
- What is a switch? **CO4**

SECTION – C

Answer any THREE questions

3 x 6 = 18 Marks

- What are ultrasonic waves? Give an account of their uses. **CO1**
- Discuss the composition of two simple harmonic motions of equal time periods at right angles also derive general equation of ellipse. **CO1**
- A circular coil has a radius of 0.1m and a number of turns of 50. Calculate magnetic induction at a point
 (i) on the axis of the coil and distance 0.2m from the centre;
 (ii) at the centre of the coil, when a current of 0.1A flows it. **CO4**
- Explain the various types of switches. **CO4**
- State and explain Biot and Savart's law. **CO4**

SECTION – D

Answer any ONE questions

1 x 12 = 12 Marks

- Describe Melde's string method to determine the frequency of an electrically maintained tuning fork by transverse and longitudinal modes. **CO1**
- Derive an expression for the field along the axis of a circular coil carrying current. **CO4**

VIVEKANANDA COLLEGE, TIRUVEDAKAM WEST - 625234**DEPARTMENT OF PHYSICS**

Course Code: 06CT11	Programme: B.Sc.,	CIA: I Test
Date: 23.07.2019	Major: PHYSICS	Semester: I
Time: 2Hrs	Year: I	Maximum: 50 Marks
Course Title:	MECHANICS	

SECTION – A**Answer All questions****10 X 1 = 10 Marks**

- An example of scalar quantity is
a) displacement b) speed c) velocity d) torque
C01
- A body covering equal displacement in equal interval of time possesses:
a) variable velocity b) uniform acceleration c) uniform velocity d) variable acceleration
C01
- Which law of motion is also called law of inertia?
a) 1st law b) 2nd law c) 3rd law d) 4th law
C01
- Which of the following pair has same direction always?
a) Force, displacement b) Force, velocity c) Force, acceleration d) Force, momentum
C01
- A feather and a lead ball are dropped from rest in vacuum on the Moon. The acceleration of the feather is:
a) more than that of the lead ball b) the same as that of the lead ball
c) less than that of the lead ball d) zero since it floats in a vacuum
C01
- The study of properties of fluids in motion is called
a) Flow analysis b) Fluid statics c) Fluid dynamics d) None
C05
- Instrument used to measure blood pressure is called
a) Venturi meter b) Blood pressure c) Sphygmomanometer d) Sonometer
C05
- SI unit of pressure is
a) N/m² b) N/m c) N-m d) N/m³
C05
- η is denoted for coefficient of:
a) Static friction b) Viscosity c) Linear expansion d) Kinetic friction
C05
- The SI unit of coefficient of viscosity is:
a) $kg\ m^2\ s$ b) $kg\ m^{-2}\ s^{-1}$ c) $kg\ m^{-2}\ s^{-2}$ d) $kg\ m^{-1}\ s^{-1}$
C05

SECTION – B**Answer any FIVE questions****5 x 2 = 10 Marks**

- In graphical method, how the acceleration of a particle is determined?
C01
- Distinguish between average velocity and instantaneous velocity
C01
- What are inertial frames of reference?
C01
- Express Newton's Second law in vector form.
C01
- Define the term pressure.
C05
- Define the term density.
C05
- What is gauge pressure?
C05

SECTION-C**Answer any THREE questions****3 x 6 = 18 Marks**

- Illustrate accelerated motion with examples.
C01
- Obtain equations of motion for one-dimensional kinematics.
C01
- A 900 kg car is going with 20 m/s along a level road. How large a constant retarding force is required to stop it in a distance of 30 m?
C01
- Using mercury barometer, explain about the measurement of the atmospheric pressure.
C05
- The mercury column in a barometer has a measured height h of 740.35 mm. The temperature is -5.0°C at which temperature, the density of mercury is $1.3608 \times 10^4\ \text{kg/m}^3$. The free fall acceleration g at the site of the barometer is $9.7835\ \text{m/s}^2$. What is atmospheric pressure?
C05

SECTION – D**Answer any ONE question****1 x 12 = 12 Marks**

- Obtain the equations of motion for a particle moving with constant acceleration.
C01
- Explain how the pressure of a fluid varies with depth.
C05

VIVEKANANDA COLLEGE, TIRUVEDAKAM WEST - 625234

DEPARTMENT OF PHYSICS

Course Code: 06CT12	Programme: B.Sc.,	CIA: I Test
Date: 26.07.2019	Major: PHYSICS	Semester: I
Time: 2Hrs	Year: I	Maximum: 50 Marks
Course Title: ELECTROMAGNETISM		

SECTION – A

Answer All questions

(10 X 1 = 10 Marks)

- | | | | | |
|--|---------------------------------------|---|---------------------------------------|------------|
| 1. The magnitude of $1/4\pi\epsilon_0$ is | | | | |
| a) 9×10^9 | b) 9×10^{-9} | c) 8.55×10^{12} | d) 8.55×10^{12} | CO1 |
| 2. The SI unit of charge is | | | | CO1 |
| a) Ohm | b) Farad | c) Volt | d) Coulomb | |
| 3. The SI unit of Electric field is | | | | CO1 |
| a) NC^{-1} | b) Vm^{-1} | c) NS^{-1} | d) both (a) and (b) | |
| 4. Two charges are separated by a distance is | | | | CO1 |
| a) Electric dipole | b) potential energy | c) Electric field | d) electric flux | |
| 5. The potential energy of a dipole in an external field to be zero when θ is | | | | CO1 |
| a) 45° | b) 90° | c) 180° | d) 0° | |
| 6. Electric field at a point on the equatorial line is | | | | CO1 |
| a) $2p/(4\pi\epsilon_0 r^2)$ | b) $p/(4\pi\epsilon_0 r^3)$ | c) $2p/(4\pi\epsilon_0 r^2)$ | d) $p/(4\pi\epsilon_0 r^2)$ | |
| 7. The path followed by a unit positive charge is | | | | CO1 |
| a) Dipole moment | b) electric dipole | c) Lines of force | d) Potential energy | |
| 8. The flux of the electric field is a | | | | CO2 |
| a) Scalar | b) vector | c) both (a) & (b) | d) none of the above | |
| 9. The differential form of Gauss law | | | | CO2 |
| a) $\nabla \cdot E = \rho/\epsilon_0$ | b) $\nabla \cdot E = \rho/\epsilon_r$ | c) $\nabla \cdot E = \delta/\epsilon_0$ | d) $\nabla \cdot E = \epsilon_0/\rho$ | |
| 10. The SI unit of Potential difference is | | | | CO2 |
| a) Newton | b) Farad | c) Coulomb | d) Volt | |

SECTION – B

Answer any FIVE questions

5 x 2 = 10 Marks

- | | |
|---|------------|
| 11. Define conductors and insulators | CO1 |
| 12. Write a note on superposition principle | CO1 |
| 13. Define the term electric field | CO1 |
| 14. What is an electric dipole? | CO1 |
| 15. Give the two properties of lines of force | CO1 |
| 16. State Gauss's law | CO1 |
| 17. What is equipotential surface? | CO1 |

SECTION – C

Answer any THREE questions

3 x 6 = 18 Marks

- | | |
|--|------------|
| 18. State and explain Coulomb's law | CO1 |
| 19. A positive charge of $q_1 = 2 \times 10^{-7} C$ is placed at a distance of 0.15m from another positive charge of $q_2 = 8 \times 10^{-7} C$. At what point on the line joining them is the electric field zero? | CO1 |
| 20. Explain in detail about the potential energy of a dipole in a uniform electric field | CO1 |
| 21. Derive an expression for an electric field at a point on the equatorial line | CO1 |
| 22. Briefly explain the electric potential as line integral of electric field | CO2 |

SECTION – D

Answer any ONE questions

1 x 12 = 12 Marks

- | | |
|---|------------|
| 23. Obtain the expression for an electric field due to a uniformly charged sphere | CO1 |
| 24. State and proof Coulomb's theorem | CO1 |

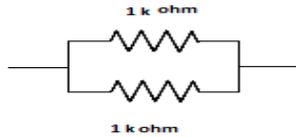
Course Code: 06CT31	Programme: B.Sc.,	CIA: I Test
Date: 23.07.2019	Major: PHYSICS	Semester: III
Time: 2Hrs	Year: II	Maximum: 50 Marks
Course Title: PRINCIPLES OF ELECTRIC CIRCUITS		

SECTION – A

ANSWER ALL QUESTIONS

10 X 1 =10 Marks

- Ideal voltage source has an internal resistance of **CO1**
 - zero
 - infinite
 - mega ohm
 - milli ohm
- Three 100 Ω resistors are in series combination, the net resistance of three resistors is **CO1**
 - 300 Ω
 - 200 Ω
 - 33.33 Ω
 - 330 Ω
- The net resistance of the given circuits is **CO1**



- 250 Ω
 - 1k Ω
 - 500 Ω
 - 2.5 k Ω
- The common point in a circuit is called **CO1**
 - earth
 - ground
 - chassis
 - reference
 - The Ohms law for the current I **CO1**
 - $\frac{V}{R}$
 - VR
 - $\frac{R}{V}$
 - IR
 - The internal resistance of an ideal current source is **CO1**
 - zero
 - infinite
 - milli ohm
 - micro ohm
 - Maximum power is delivered across the load when **CO1**
 - $R_S = R_L$
 - $R_S > R_L$
 - $R_L > R_S$
 - $R_L \neq R_S$
 - 1A current passes through the resistor of 10 Ω, the potential difference at the resistor is **CO1**
 - 1 V
 - 10 V
 - 1mV
 - 10 mV
 - Three 33 Ω resistors are connected in parallel combination, the net resistance value is **CO1**
 - 11 Ω
 - 10 Ω
 - 12 Ω
 - 33 Ω
 - 0.5 A current passed through the resistor of 10 Ω, the power delivered at the resistor is **CO1**
 - 2.5 W
 - 0.5 W
 - 50 W
 - 5 W

SECTION – B

ANSWER any FIVE QUESTIONS

5 X 2 =10 Marks

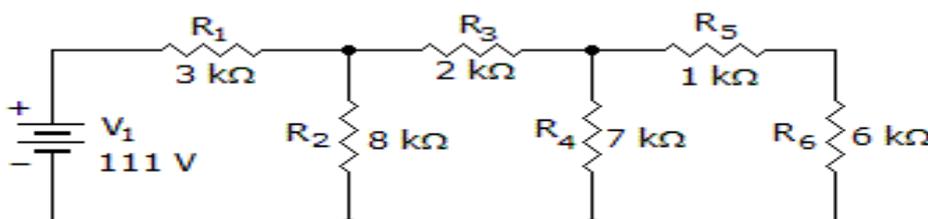
- Define series – parallel resistive circuit. **CO1**
- List the circuit laws and formulas that may be necessary in the analysis of series – parallel circuit. **CO1**
- What does earth ground mean? **CO1**
- Sketch a basic three step ladder network. **CO1**
- What is the symbol for the ideal voltage source? **CO1**
- Write the formula for converting a voltage source to a current source. **CO1**
- State the maximum power transfer theorem. **CO1**

SECTION – C

ANSWER any THREE QUESTIONS

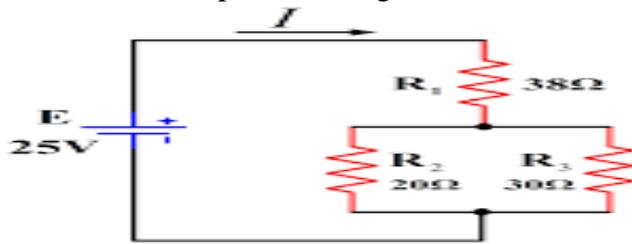
3 X 6=18 Marks

- Find the total resistance and total current of the given circuit. **CO1**



19. Determine the current passes through the resistor R_3 of the following circuit.

C01

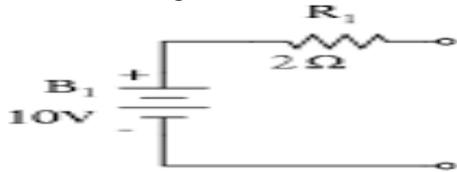


20. Explain the maximum power transfer theorem.

C01

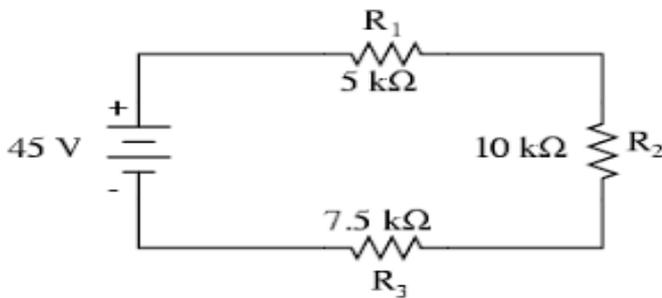
21. Convert the voltage source to current source for the given circuit.

C01



22. Find the voltage drop across each resistor for the following circuit.

C01



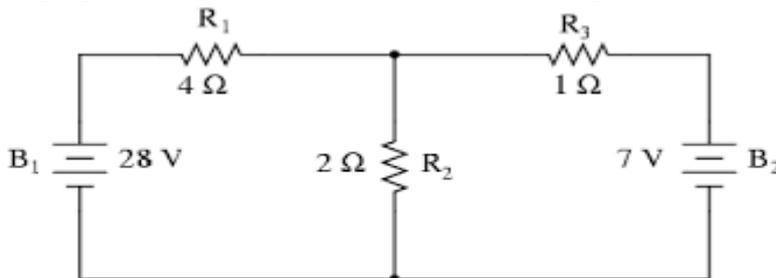
SECTION – D

ANSWER any one QUESTION

1 X 12 = 12 Marks

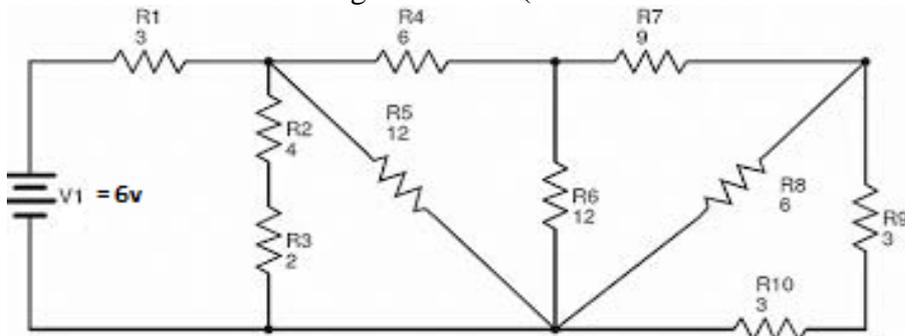
23. Using superposition theorem, find the current through the resistor R_2

C01



24. Find the total current for the given circuit (all the resistors are in kilo ohm)

C01



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Course Code: 06CT32	Programme: B.Sc.,	CIA: I Test
Date: 26.07.2019	Major: PHYSICS	Semester: III
Time: 2Hrs	Year: II	Maximum: 50 Marks
Course Title:	SPECTROSCOPY	

SECTION – A

Answer All questions

10 X 1 = 10 Marks

- In Rutherford experiment, scattering of α particles is due to ___ between the α particle and the positive charge of the nucleus **CO1**
 a) Electrostatic repulsive force b) gravitational force c) electrostatic attractive force d) all the above
- Lyman series lie in the _____ region **CO1**
 a) visible b) ultraviolet c) infrared d) microwave
- _____ series lies in the visible region of the hydrogen spectrum **CO1**
 a) Lyman b) Balmer c) Paschen d) Brackett
- Rydberg constant, $R =$ _____ **CO1**
 a) $me^4 / 8\epsilon_0^2 ch^3$ b) $me^3 / 8\epsilon_0^2 ch^3$ c) $me^4 / 8\epsilon_0^2 ch^4$ d) $me^4 / 8\epsilon_0^3 ch^3$
- Reduced mass of the electron in an atom is $\mu =$ _____ **CO1**
 a) $Mm / (m+M)$ b) $Mm / (m-M)$ c) M^2m^2 d) $Mm / 2$
- Zeeman effect can be explained with the help of _____ atom model **CO1**
 a) Neils Bohr b) Rutherford c) Somerfeld d) Vector
- Reciprocal of a wavelength in vacuum of a radiation is _____ **CO1**
 a) frequency b) time period c) wave number d) wavelength
- Energy required to remove an electron from a given orbit to an infinite distance from the nucleus is **CO1**
 a) ionization potential b) critical potential c) excitation potential d) normal potential
- In Franck and Hertz's method _____ vapour is filled in the tube. **CO1**
 a) sodium b) mercury c) helium d) neon
- _____ helps us to calculate the number of electrons that can occupy a given sub shell. **CO2**
 a) Quantum number b) Coupling scheme c) Pauli exclusion principle d) dipole moment

SECTION – B

Answer any FIVE questions

5 x 2 = 10 Marks

- State correspondence principle. **CO1**
- Mention the main features of the vector atom model. **CO1**
- What do you mean by alkali spectra? **CO1**
- Mention two ways of exciting an atom. **CO1**
- State two features of Rutherford nuclear atom model. **CO1**
- What is the significance of correspondence principle? **CO1**
- State Pauli's exclusion principle. **CO2**

SECTION – C

Answer any THREE questions

3 x 6 = 18 Marks

- Describe the Bohr atom model and derive the radius of the n^{th} permissible orbit for hydrogen. **CO1**
- Describe the Frank and Hertz method to determine the critical potential. **CO1**
- Discuss the coupling schemes used in atoms having two or more electrons. **CO2**
- Calculate the a) wave number b) wavelength and c) frequency of H_α line of hydrogen. **CO1**
 Assume that the nucleus has infinite mass. Find the wavelength of the Balmer series limit.
- Using Bohr's theory of hydrogen spectrum, calculate the circumference of the first Bohr's orbit and the linear momentum of the electron moving in that orbit. Find de-Broglie wavelength of this electron. **CO1**

SECTION – D

Answer any ONE question

1 x 12 = 12 Marks

- Calculate the total energy of the electron. Explain spectral series of hydrogen with energy level diagram. **CO1**
- Explain Davis and Goucher experiment to determine excitation and ionization potentials. **CO1**

VIVEKANANDA COLLEGE, TIRUVEDAKAM WEST - 625234**DEPARTMENT OF PHYSICS**

Course Code: 06CT51	Programme: B.Sc.,	CIA: I Test
Date: 24.07.2019	Major: PHYSICS	Semester: V
Time: 2Hrs	Year: III	Maximum: 50 Marks
Course Title:	SOLID STATE PHYSICS	

SECTION – A**Answer All questions****10 X 1 = 10 Marks**

- There are ____ distinguishable ways of arranging points in three dimensional space called Bravais lattices
 - 14
 - 7
 - 8
 - 5
- The only element exhibiting simple cubic structure is
 - silver
 - diamond
 - zinc
 - polonium
- Materials having different properties along different directions are called
 - isotropic
 - anisotropic
 - amorphous
 - homogeneous
- Below transition temperature, a superconducting material exhibits
 - only zero resistance
 - only diamagnetic property
 - zero resistance and diamagnetism
 - zero resistance and ferromagnetism
- Examples of type-I superconductors are
 - Al, Nb and Ta
 - Al, Zn and Hg
 - Ta, V and Nb
 - none of these
- In type-I superconductors the coherence length is of the order of
 - 10^6 m
 - 10^{-3} m
 - 10^3 m
 - 10^{-6} m
- In superconducting material average isotopic mass M is related to the transition temperature by (where α is called the isotope effect coefficient)
 - MT_c^α
 - $MT_c = \text{infinite}$
 - $\alpha M = T_c$
 - $M^\alpha T_c = \text{constant}$
- Magnetic susceptibility is given by (for superconductors)
 - $\chi = +1$
 - $\chi = -1$
 - $\chi < 1$
 - $\chi > 1$
- The correlation of wave function of super electrons on both sides of a thin insulating layer sandwiched between two superconductors is known as
 - Meissner effect
 - London effect
 - Isotope effect
 - Josephson effect
- The term SQUIDS stands for
 - Superconducting Quantum Interference Devices
 - Superconducting Quality Inter Devices
 - Superconducting Quantum Interference Delivery
 - Superconducting Quantum Intercom Devices

SECTION – B**Answer any FIVE questions****5 x 2 = 10 Marks**

- Explain the term: unit cell.
- Mention seven crystal systems in 3D.
- What is superconductivity?
- State critical temperature or transition temperature
- What does cooper electron mean?
- Define the term penetration depth
- What is Josephson effect?

SECTION – C**Answer any THREE questions****3 x 6 = 18 Marks**

- Calculate the c/a ratio for hcp structure.
- Copper has FCC structure and the atomic radius is 1.278 \AA . Calculate the density of copper crystal. Given atomic weight of copper is 63.5.
- State and explain the Meissner effect in superconductor with illustration.
- Calculate the critical current for a wire of lead having a diameter of 1mm at 4.2K. The critical temperature for lead is 7.18K and $H_0 = 6.5 \times 10^4 \text{ A/m}$.
- Give a brief account of BCS theory of superconductivity.

SECTION – D**Answer any ONE question****1 x 12 = 12 Marks**

- Obtain the atomic packing factor for simple cubic, BCC and FCC structures.
- Derive first and second London equation.

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DEPARTMENT OF PHYSICS

Course Code: 06CT52	Programme: B.Sc.,	CIA: I Test
Date: 25.07.2019	Major: PHYSICS	Semester: V
Time: 2Hrs	Year: III	Maximum: 50 Marks
Course Title:	DIGITAL ELECTRONICS	

SECTION – A

Answer All questions

10 X 1 = 10 Marks

- Decimal number 10 is equal to binary number
a) 1110 b) 1010 c) 1001 d) 1000
- Which device has one input and many outputs?
a) multiplexer b) demultiplexer c) counter d) flip flop
- The number of bits in ASCII is
a) 12 b) 10 c) 9 d) 7
- The inverter is ____
a) NOT gate b) OR gate c) AND gate d) None of the above
- In Boolean algebra, the plus sign (+) indicates
a) OR operation b) AND operation c) NOT operation d) None of the above
- A flip flop is a
a) Combinational circuit b) memory element c) Arithmetic element d) memory or arithmetic element
- A register is type of a
a) Combinational circuit b) memory element c) Arithmetic element d) memory or arithmetic element
- A register is defined as
a) The group of latches for storing one bit of information
b) The group of latches for storing n-bit of information
c) The group of flip-flops suitable for storing one bit of information
d) The group of flip-flops suitable for storing binary information
- What type of register would have a complete binary number shifted in one bit at a time and have all the stored bits shifted out one at a time?
a) Parallel-in Parallel-out b) Parallel-in Serial-out c) Serial-in Parallel-out d) Serial-in Serial-out
- In serial shifting method, data shifting occurs
a) One bit at a time b) simultaneously c) two bit at a time d) four bit at a time

SECTION – B

Answer any FIVE questions

5 x 2 = 10 Marks

- What is the primary difference between RS flip flop and JK flip flop?
- What is positive edge triggering?
- Draw the symbols for the positive & negative edge trigger.
- What does an entry X mean in a flip flop truth table?
- Expand ASCII.
- Write down the letter COLLEGE@madurai in ASCII code format.
- Convert binary 110.001 to a decimal number.

SECTION – C

Answer any THREE questions

3 x 6 = 18 Marks

- Explain RS flip flop in detail.
- Explain asynchronous counter in detail.
- Illustrate JK Master Slave flip flop in detail.
- Convert Hexadecimal F8E6.39 to decimal
- Add these 8 bit numbers 0101 0111 and 0011 0101. Then, show the same number in hexadecimal notation

SECTION – D

Answer any ONE question

1 x 12 = 12 Marks

- Explain serial in serial out register in detail.
- Convert the following

- $(23.6)_{10} = (\text{-----})_2$
- $(175.23)_8 = (\text{-----})_{10}$
- $(34.562)_8 = (\text{-----})_2$
- $(1110100011010110)_2 = (\text{-----})_{16}$

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DEPARTMENT OF PHYSICS

Course Code: 06EP51	Programme: B.Sc.,	CIA: I Test
Date: 26.07.2019	Major: PHYSICS	Semester: V
Time: 2Hrs	Year: III	Maximum: 50 Marks
Course Title:	OBJECT ORIENTED PROGRAMMING WITH C++	

SECTION – A

Answer All questions

10 X 1 = 10 Marks

- C++ is a Programming language
a) Object oriented b) Procedure oriented c) Object based d) Procedure based
- Object-oriented programming is
a) bottom-up approach b) top-down approach c) bottom approach d) top approach
- are the basic run-time entities in an Object-oriented system
a) Classes b) Objects c) Structures d) Arrays
- The wrapping up of data and functions into a single unit is called
a) inheritance b) polymorphism c) encapsulation d) data hiding
- The insulation of the data from direct access by the program is called
a) data hiding b) data abstraction c) encapsulation d) polymorphism
- is the process by which object of one class acquire the properties of objects of another class
a) member function b) inheritance c) data hiding d) polymorphism
- means the ability to take more than one form
a) Overloading b) Encapsulation c) Polymorphism d) Inheritance
- refers to putting together essential features without including background details
a) Data abstraction b) Data members c) Data hiding d) Encapsulation
- Data that may be accessed by all the functions of a program is called data
a) global b) local c) both a and b d) neither a nor b
- The input operator used in C++ is
a) >> b) << c) arithmetic operator d) logical operator

SECTION – B

Answer any FIVE questions

5 X 2 = 10 Marks

- Define object.
- Define class.
- What do you mean by encapsulation?
- What is called insertion operator?
- What is called extraction operator?
- What do you mean by data abstraction?
- Define inheritance.

SECTION – C

Answer any THREE questions

3 X 6 = 18 Marks

- Write a C++ program to find biggest among three numbers using logical AND operator.
- Write a C++ program to convert Fahrenheit temperature to Celsius temperature and vice-versa using if-else statement.
- Write a C++ program to find sum and average of the given numbers using while loop.
- Write a C++ program to convert Binary number to Decimal number.
- Write a C++ program to convert Decimal number to Binary number.

SECTION – D

Answer any ONE question

1 X 12 = 12 Marks

- Explain the structure of C++ program.
- Sketch the hierarchy of C++ data types and explain.

VIVEKANANDA COLLEGE, TIRUVEDAKAM WEST - 625234**DEPARTMENT OF PHYSICS**

Course Code: 06CT31	Programme: B.Sc.,	CIA: I Test
Date: 20.07.2019	Major: PHYSICS	Semester: III
Time: 1Hrs	Year: II	Maximum: 25 Marks
Course Title:	SOLAR ENERGY	

SECTION – A**Answer all questions****5 X 1 = 5**

- The upper layer of the convective zone is called _____ **CO1**
a) Chromospheres b) Photosphere c) Convective layer d) corona
- The solar constant is _____ **CO1**
a) 1353 W/m² b) 1535 W/m² c) 1335 W/m² d) 1533 W/m²
- Which of the following instrument for the measurement of terrestrial radiation only? **CO2**
a) Pyrheliometer b) Pyranometer c) Pyrgeometer d) Pyradiometer
- The instrument is used to measure the duration in hours of bright sunshine during the course of the day is **CO2**
a) Pyranometer b) Sunshine recorder c) Eppley Pyranometer d) Yellot Solarimeter
- In India, a simple instrument is often used for quick measurement of the total solar radiation is **CO2**
a) Agni b) Suryamapi c) Suryalight d) Suryavista

SECTION – B**Answer any two questions****2 x 2 = 4**

- Define Solar constant. **CO1**
- List out the different solar energy measuring equipments. **CO2**
- Write down the facts about the solar radiation outside the earth's atmosphere. **CO1**
- Mention some demerits of solar cooker. **CO1**

SECTION – C**Answer any one question****1 x 6 = 6**

- Write a shot note on uses of solar energy. **CO1**
- Give an account on different types of solar energy measuring equipments.

SECTION – D**Answer any one question****1 x 10 = 10**

- Explain the structure of the sun. **CO1**
- Explain Sunshine recorder in detail.

VIVEKANANDA COLLEGE, TIRUVEDAKAM WEST - 625234

DEPARTMENT OF PHYSICS

Course Code: 06SB51	Programme: B.Sc.,	CIA: I Test
Date: 20.07.2019	Major: PHYSICS	Semester: V
Time: 1Hr	Year: III	Maximum: 25 Marks
Course Title:	FIBRE OPTIC COMMUNICATION	

SECTION – A

Answer All questions

5 X 1 = 5 Marks

- Refractive index is denoted by
a) λ b) v c) μ d) n
- Fractional difference between the core and cladding refractive indexes, $\Delta = \dots\dots\dots$
a) $(\mu_2 - \mu_1) / \mu_1$ b) $(\mu_1 - \mu_2) / \mu_1$ c) $(\mu_1 - \mu_2) / \mu_2$ d) $(\mu_2 - \mu_1) / \mu_2$
- The velocity of light in a substance is expressed as $V_{\text{sub}} = \dots\dots\dots$
a) c / λ b) λ / c c) μ / c d) c / μ
- Numerical aperture for the fibres used in short distance communications are in the range $\dots\dots\dots$
a) 0.3 to 0.4 b) 0.4 to 0.5 c) 0.5 to 0.6 d) 0.6 to 0.7
- θ_c is the
a) angle of incidence b) critical angle of reflection
c) critical angle of refraction d) critical angle of incidence

SECTION – B

Answer any TWO questions

2 X 2 = 4 Marks

- Express refractive index of the material.
- Draw the diagrams of reflection, refraction and total internal reflection of light waves.
- What are the two conditions of total internal reflection in the walls of the fibre?
- Draw the diagrams of stepped index multimode propagation $\mu_1 > \mu_2$

SECTION – C

Answer any ONE question

1 X 6 = 6 Marks

- Compute the numerical aperture, acceptance angle and critical angle of the fibre having μ_1 (core refractive index) = 1.50 and the refractive index of the cladding = 1.45
- Calculate the refractive indices of the core and cladding material of a fibre from the following data:
NA = 0.22 and $\Delta = 0.012$

SECTION – D

Answer any ONE question

1 X 10 = 10 Marks

- With neat diagram explain acceptance angle and acceptance cone of a optical fibre.
- Discuss about Numerical aperture.

VIVEKANANDA COLLEGE, TIRUVEDAKAM WEST - 625234

DEPARTMENT OF PHYSICS

Course Code: 06AT01	Programme: B.Sc.,	CIA: II Test
Date: 07.09.2019	Major: MATHS / CHEMISTRY	Semester: I
Time: 2Hrs	Year: I	Maximum: 50 Marks
Course Title:	ALLIED PHYSICS - I	

SECTION – A

Answer All questions

(10 X 1 = 10 Marks)

- Within the elastic limit, the stress is directly proportional to strain. CO2
 - Stokes law
 - Hooke's law
 - Newton's law
 - Charles's law
- _____ is defined as the restoring force per unit area CO2
 - Strain
 - Stress
 - Compression
 - elongation
- It is defined as the ratio of volume stress to the volume strain. CO2
 - Young's Modulus
 - Rigidity Modulus
 - Bulk Modulus
 - Poission's ratio
- The dimensional formula of modulus of elasticity is CO2
 - $ML^{-1}T^{-2}$
 - $ML^{-2}T^{-1}$
 - $ML^{-2}T^{-2}$
 - ML^1T^2
- The Poisson's ratio is CO2
 - Lateral strain/longitudinal strain
 - bulk stress/volume strain
 - Tangential stress/shearing strain
 - longitudinal stress/longitudinal strain
- The ratio Q/V is called the capacitance of the CO4
 - conductor
 - insulator
 - resistance
 - rheostat
- The unit of capacitance is CO4
 - farad
 - henry
 - coulomb
 - joule
- When a ray of light falls on the boundary separating the two media, there is a change in direction of the ray. This phenomenon is known as CO5
 - reflection
 - refraction
 - total internal reflection
 - diffraction
- The refractive index of material of prism CO5
 - $\sin(A+D/2) / \sin A/2$
 - $\cos(A+D/2) / \sin A/2$
 - $\sin(A+D/2) / \cos A/2$
 - $\cos(A+D/2) / \cos A/2$
- For direct vision spectroscopy, the refracting angles of the prisms are such that the total deviation produced for the mean rays is CO5
 - positive
 - negative
 - zero
 - none of the above

SECTION – B

Answer any FIVE questions

5 x 2 = 10 Marks

- Define Reverberation. CO1
- Define Absorption coefficient CO1
- State Hook's law. CO2
- List out the different moduli of elasticity. CO2
- What is a choke coil? CO4
- Why do choke coil to be preferred for diminishing the current? CO4
- State Snell's law. CO5

SECTION – C

Answer any THREE questions

3 x 6 = 18 Marks

- Derive an expression for the bending moment. CO2
- Obtain an expression for the total work done in stretching a wire. CO2
- Find the energy stored in a wire 5 m long and 10^{-3} m in diameter when it is stretched through 3×10^{-3} m by a load. Young's modulus of material is $2 \times 10^{11} \text{ Nm}^{-2}$ CO2
- Explain a direct vision spectroscopy. CO5
- A 20 V, 5 W lamp is to be used on ac mains of 200 V, 50 Hz. Calculate the CO4
 - Capacitor
 - inductor, to be put in the series to run the lamp. How much pure resistance should be Included in place of the devices so that the lamp can run on its rated voltage? Which of the above arrangements will be more economical and why?

SECTION – D

Answer any ONE questions

1 x 12 = 12 Marks

- Explain about the factors affecting the acoustics of building. CO1
- Discuss briefly about refraction through prism to obtain refractive index. CO5



DEPARTMENT OF PHYSICS

Course Code: 06CT12	Programme: B.Sc.,	CIA: II Test
Date: 06.09.2019	Major: PHYSICS	Semester: I
Time: 2Hrs	Year: I	Maximum: 50 Marks
Course Title: ELECTROMAGNETISM		

SECTION – A

Answer All questions

(10 X 1 = 10 Marks)

- The relation between the electric field and electric potential is
 a) $E = -\text{grad } V$ b) $E = -\text{Div } V$ c) $E = \text{Curl } V$ d) $E = -\text{curl } V$ CO2
- The capacitance $C =$
 a) Q/V b) V/Q c) QV d) F/Q CO2
- The capacitor is a device for storing
 a) current b) voltage c) magnetic field d) charge CO2
- Which of the following is the example of practical cylindrical capacitors is
 a) optical fibre cable b) submarine cable c) audio cable d) video cable CO2
- The capacitance of parallel plate capacitor is $C =$
 a) $\epsilon_0 A / d$ b) $\epsilon_r A / d$ c) $\epsilon_0 d / r$ d) $\epsilon_0 \epsilon_r / d$ CO2
- Which of the following element used as a dielectric medium in variable air capacitor
 a) air b) mica c) aluminium d) metal sheet CO2
- Current is _____ quantity CO3
 a) scalar b) vector c) both (a) & (b) d) none of the above
- The power dissipated in a resistance R carrying a current i is CO3
 a) $P = V^2/R$ b) $P = V/R^2$ c) $P = V/R$ d) $P = V/R^3$
- The Carey foster bridge is a form of CO3
 a) Anderson bridge b) wheatstones bridge c) Kelvin double bridge d) none of the above
- Which of the following device for measuring or comparing potential differences CO3
 a) Carey foster bridge b) Kelvin double bridge c) Potentiometer d) Seeback effect

SECTION – B

Answer any FIVE questions

5 x 2 = 10 Marks

- How to calculate the potential difference between two points CO2
- What is capacitance of a conductor? CO2
- Give any two uses of capacitors CO2
- Write a note on current density CO3
- What is resistivity? Give the unit of conductivity CO3
- Define temperature coefficient of resistance CO3
- State principle of a potentiometer CO3

SECTION – C

Answer any THREE questions

3 x 6 = 18 Marks

- Derive the relation between electric field and the electric potential CO2
- Explain the capacitance of a parallel plate capacitor with a neat diagram CO2
- A sphere of 10 cm diameter is suspended within a hollow sphere of 12 cm diameter. If the inner sphere be charged to a potential of 15000 volt and the outer sphere be earthed, find the charge on the inner sphere. CO2
- Give a brief note on guard ring capacitor and mica capacitors with illustration CO2
- Explain Ohm's law and electrical conductivity CO3

SECTION – D

Answer any ONE question

1 x 12 = 12 Marks

- Derive an expression for the combined capacitance of 3 capacitors connected in (i) series (ii) parallel CO2
- Discuss the description and theory of Carey foster bridge with a neat diagram and to find the value of ρ . CO3



VIVEKANANDA COLLEGE, TIRUVEDAKAM WEST - 625234**DEPARTMENT OF PHYSICS**

Course Code: 06CT31	Programme: B.Sc.,	CIA: II Test
Date: 03.09.2019	Major: PHYSICS	Semester: III
Time: 2Hrs	Year: II	Maximum: 50 Marks
Course Title:	PRINCIPLES OF ELECTRIC CIRCUITS	

SECTION – A**ANSWER ALL QUESTIONS****10 X 1 =10 Marks**

- During each cycle, a sine wave reaches a peak value **CO2**
 - one time
 - two times
 - four times
 - a number of times depending on the frequency
- If the peak value of a sine wave is 20 V , the rms value is **CO2**
 - 14.14V
 - 6.37V
 - 12.74V
 - 0.707V
- A phasor represents **CO2**
 - the magnitude of a quantity
 - the magnitude and phase angle of a quantity
 - The phase angle
 - the length of a quantity
- A 10 kHz pulse wave form consist of pulses that are 10 μ s wide. Its duty cycle is **CO2**
 - 100%
 - 20%
 - 1%
 - 10%
- The duty cycle of square wave is **CO2**
 - varies with the frequency
 - varies with the pulse width
 - varies with the amplitude
 - 50 %
- The complex number $5 + j5$ is equivalent to **CO2**
 - $5 \angle 45^\circ$
 - $25 \angle 0^\circ$
 - $7.07 \angle 45^\circ$
 - $7.07 \angle 135^\circ$
- What is the correct expression of ω ? **CO2**
 - $\omega=2\pi$
 - $\omega=2 \pi f$
 - $\omega= \pi f$
 - $\omega=2f$
- Duty cycle for square wave is **CO2**
 - 50 %
 - 70.7%
 - 30.3 %
 - 100 %
- Power that is measured in volt-amperes is called **CO3**
 - impedance power
 - reactive power
 - true power
 - apparent power
- A 6 kHz sinusoidal voltage is applied to a series RC circuit. The frequency of the voltage across the resistor is **CO3**
 - 2kHz
 - 18 kHz
 - 6 kHz
 - 0

SECTION – B**ANSWER any FIVE QUESTIONS****5 X 2 =10 Marks**

- Define the term pulse width. **CO2**
- What are harmonics? **CO2**

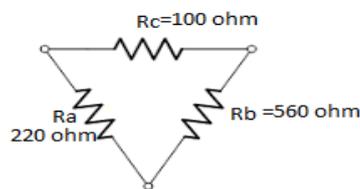
13. Define rise time and fall time. CO2
14. Convert $2 + j2$ to polar form. CO2
15. Locate the point $5 - j5$ on complex plane. CO2
16. Distinguish between impedance and resistance. CO3
17. If $Z = 100 \Omega$, what is the value of Y ? CO3

SECTION – C

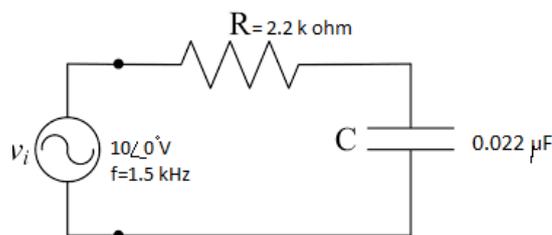
ANSWER any THREE QUESTIONS

3 X 6=18 Marks

18. Convert the delta network to wye network for the given circuit CO1



19. How do you determine various voltage and current values of a sine wave? CO2
20. Subtract $1 + j2$ from $3 + j4$ ii) Divide $100 \angle 50^\circ$ by $25 \angle 20^\circ$. CO2
21. Describe the relationship between current and voltage in a series RC Circuit. CO3
22. Determine the current in the following circuit and draw a phasor diagram showing the relation between source voltage and current. CO3



SECTION – D

ANSWER any one QUESTION

1 X 12 = 12 Marks

23. Write the characteristics of basic non sinusoidal wave forms. CO2
24. Discuss how the RC circuit operates as a filter. CO3



DEPARTMENT OF PHYSICS

Course Code: 06CT32	Programme: B.Sc.,	CIA: II Test
Date: 06.09.2019	Major: PHYSICS	Semester: III
Time: 2Hrs	Year: II	Maximum: 50 Marks
Course Title:	SPECTROSCOPY	

SECTION – A

Answer All questions

10 X 1 = 10 Marks

- In uniform magnetic field, the dipole experiences a torque and aligns _____ to the field **CO2**
 a) parallel b) perpendicular c) 45° d) 60°
- The transition of an electron between two levels obeys the selection rule for L is $\Delta L =$ _____ **CO2**
 a) $\Delta L = 0$ b) $\Delta L = \pm 1$ c) $\Delta L = 2$ d) $\Delta L = 3$
- Transition of an electron between two levels with strong intensity is possible if ____ **CO2**
 a) $\Delta L = \Delta J$ b) $\Delta L \neq \Delta J$ c) $\Delta L = -\Delta J$ d) $\Delta L = 0$
- The orbital and spin angular momentum coupling of the electron explains the ____ of spectral lines. **CO2**
 a) reduction in intensity b) fine structure c) enhancement of intensity d) hyperfine structure
- Splitting of spectral lines observed when the radiating atoms, ions, or molecules are subjected to a strong electric field is called _____ **CO2**
 a) Stark effect b) Zeeman effect c) anomalous Zeeman effect d) Paschen-Back effect
- When a molecule has all the three moments of inertia identical, it is called a _____ molecule **CO3**
 a) Linear b) Symmetric top c) Spherical top d) Asymmetric top
- Rotation of molecules about three mutually perpendicular directions through the centre of gravity occurs in _____ region **CO3**
 a) Radiofrequency b) Microwave c) Infrared d) Visible
- Which among the following is 'microwave active'? **CO3**
 a) Cl_2 b) H_2 c) CH_3Cl d) all the above
- In microwave oven, ____ molecules absorb microwave radiation and raises to high rotational states **CO3**
 a) food b) water c) ammonia d) hydrogen
- Hollow tubes of _____ is used as wave guide in Microwave spectroscopy **CO3**
 a) gold b) platinum c) aluminium d) copper

SECTION – B

Answer any FIVE questions

5 x 2 = 10 Marks

- Give the reason for magnetic moments of atoms. **CO2**
- What is gyro magnetic ratio? **CO2**
- State Larmor's theorem. **CO2**
- Write down the formula for Lande g factor. **CO2**
- Why OCO (CO_2) is microwave inactive? **CO3**
- Mention any two uses of microwave spectroscopy **CO3**
- What are the precautions to be taken while using a microwave oven? **CO3**

SECTION – C

Answer any THREE questions

3 x 6 = 18 Marks

- Calculate the magnetic dipole moment due to i) orbital motion and ii) spin of the electron. **CO2**
- What is the significance of spin-orbit coupling? **CO2**
- Classify the molecules on the basis of their principal moments of inertia. **CO3**
- A beam of electrons enter a uniform magnetic field of 1.2 T. Calculate the energy difference between electrons whose spins are parallel and antiparallel to the field. **CO2**
- The rotational spectrum of HCl shows series of lines separated by 20.6 cm^{-1} . Find the moment of inertia and the internuclear distance. **CO3**

SECTION – D

Answer any ONE question

1 x 12 = 12 Marks

- What is Zeeman effect? Derive the expression for Zeeman shift. **CO2**
- Calculate the allowed rotational energies of a rigid diatomic molecule. **CO3**



VIVEKANANDA COLLEGE, TIRUVEDAKAM WEST - 625234**DEPARTMENT OF PHYSICS**

Course Code: 06CT51	Programme: B.Sc.,	CIA: II Test
Date: 04.09.2019	Major: PHYSICS	Semester: V
Time: 2Hrs	Year: III	Maximum: 50 Marks
Course Title:	SOLID STATE PHYSICS	

SECTION – A**Answer All questions****10 X 1 = 10 Marks**

- X-rays are used for diffraction studies in crystals because
 - the wavelength of radiation is of the same range as that of interatomic spacing
 - X-rays penetrate the crystals
 - Crystals have atoms/molecule capable of scattering X- rays
 - we cannot use visible light
- The necessary condition for X-ray diffraction from crystals to occur is
 - $n\lambda \geq 2d$
 - $n\lambda = d$
 - $n\lambda \leq 2d$
 - $n\lambda > d$
- In a simple cubic lattice $d_{100} : d_{110} : d_{111}$ is
 - 6 : 3 : 2
 - 6 : 3 : $\sqrt{2}$
 - $\sqrt{6} : \sqrt{3} : \sqrt{2}$
 - $\sqrt{6} : \sqrt{4} : \sqrt{5}$
- The unit of magnetic field intensity is
 - Am^{-1}
 - Hm^{-1}
 - Wb m^{-2}
 - no units
- Relative permeability is related to magnetic susceptibility by
 - $\mu_r = 1 - \chi$
 - $\mu_r = \chi - 1$
 - $\mu_r = 1 + \chi$
 - $\mu_r = 1 / \chi$
- Diamagnetic susceptibility is
 - large, negative
 - small, positive
 - small, negative
 - large, positive
- Which of the following statement is wrong?
 - Diamagnetic property is independent of temperature
 - Paramagnetic property is independent of temperature
 - Paramagnetic property is dependent of temperature
 - Ferromagnetic property is dependent of temperature
- The temperature at which the transition of antiferro to para magnetism takes place is called
 - Curie-Weiss temperature
 - Curie temperature
 - Debye temperature
 - Neel temperature
- The transition from the ferromagnetic to the paramagnetic state is named after
 - Curie
 - Curie-Weiss
 - Neel
 - Debye
- One Bohr magneton equals
 - $9.27 \times 10^{-24} \text{ A-m}^2$
 - $9.1 \times 10^{-31} \text{ A-m}^2$
 - $9.27 \times 10^{-16} \text{ A-m}^2$
 - $9.1 \times 10^{-24} \text{ A-m}^2$

SECTION – B**Answer any FIVE questions****5 x 2 = 10 Marks**

- State Bragg's law
- Differentiate between Frenkel and Schottky defects
- Define the term magnetic induction
- What is magnetization?
- Write any two properties of antiferromagnetic materials
- Explain nuclear spin
- What is ferromagnetism?

SECTION – C**Answer any THREE questions****3 x 6 = 18 Marks**

- Deduce the expression for inter-planar spacing distance in terms of Miller indices for a cubic structure.
- A beam of X-rays are incident on a NaCl crystal with lattice spacing 0.282 nm. Calculate the wavelength of X-rays if the first order Bragg reflection takes place at a glancing angle of $8^\circ 35'$. Also calculate the maximum order of diffraction possible.
- Explain about paramagnetism and its properties
- The magnetic field intensity in a piece of ferric oxide is 10^6 amp/metre. If the susceptibility of the material is 1.5×10^{-3} , Calculate the magnetization of the material and the flux density.
- Derive an expression for magnetic moment associated with it due to its orbital motion

SECTION – D**Answer any ONE question****1 x 12 = 12 Marks**

- Describe the three main X-ray diffraction methods by which crystal structure can be determined.
- Describe the classical theory of diamagnetism



Course Code: 06EP51	Programme: B.Sc.,	CIA: II Test
Date: 06.09.2019	Major: PHYSICS	Semester: V
Time: 2Hrs	Year: III	Maximum: 50 Marks
Course Title:	OBJECT ORIENTED PROGRAMMING WITH C++	

SECTION – A

Answer All questions

10 X 1 = 10 Marks

- C++ provides various types of tokens that includes keywords, identifiers, constants, strings and operators.
A) tokens B) expressions C) structures D) none
- refer to the names of variables, functions, arrays, classes etc. created by programmer.
A) Keywords B) Identifiers C) Constants D) Strings
- are widely used in C++ for memory management and to achieve polymorphism.
A) Pointers B) Array C) Function D) Class
- C++ permits initialization of the variables at run time which is referred to as initialization.
A) static B) dynamic C) variable D) runtime
- A reference variable must be initialized at the time of
A) initialization B) declaration C) running D) definition
- Which of the following is the scope resolution operator in C++.
A) :: B) :: * C) - >* D) . *
- The operator is known as compound assignment or short-hand assignment operator.
A) = B) = = C) += = D) +=
- Assigning one or more function body to the same name is called
a. Function Overriding b. Function Overloading c. Both a and b d. None of the above
- In C++, the declaration of functions and variables are collectively called
A) class members B) function members C) object members D) member variables
- The keywords private and public used in C++ are known as
A) keyword labels B) visibility labels C) declaration labels D) display labels

SECTION – B

Answer any FIVE questions

5 X 2 = 10 Marks

- Write down any two operators exclusively used in C++
- Draw the flowchart of if-else statement.
- What do you mean by implicit conversion?
- Define overloading.
- Write down general form of for statement.
- Give one example of default argument(s).
- Write down the general form of a class declaration.

SECTION – C

Answer any THREE questions

3 X 6 = 18 Marks

- Discuss about different types of expressions.
- With examples, explain Special Assignment Expressions.
- Draw the flowchart of Basic Control Structures.
- Distinguish between call by reference and return by reference.
- Discuss about inline function.

SECTION – D

Answer any ONE question

1 X 12 = 12 Marks

- Write a program to find largest among two numbers using nesting of member function.
- Write a program to find the factorial of the given number using recursive function



VIVEKANANDA COLLEGE, TIRUVEDAKAM WEST - 625234

DEPARTMENT OF PHYSICS

Course Code: 06SB31	Programme: B.Sc.,	CIA: II Test
Date: 30.08.2019	Major: PHYSICS	Semester: III
Time: 1Hr	Year: II	Maximum: 25 Marks
Course Title:	SOLAR ENERGY	

SECTION – A

Answer all questions

5 X 1 = 5

1. Which of the following scientist devised solar furnace composed of a paraboloidal concentrator and a lens? **CO5**
a) Lavoisier b) M.K.Ghosh c) Strauble d) Trombe
2. Which one of the following instrument to get high temperatures by concentrating solar radiations onto a specimen. **CO5**
a) Solar furnace b) Pyranometer c) pyheliometer d) pyrdioemeter
3. The radiation absorbed by the plate reduced by a factor of (1-d) where d is _____. **CO2**
a) 0.02 b) 0.002 c) 0.20 d) 2.00
4. The radiation absorbed by the plate reduced by a factor of (1-s) where s is _____. **CO2**
a) 0.03 b) 0.003 c) 0.30 d) 3.00
5. Which of the following plate should have high thermal conductivity an adequate tensile strength. **CO2**
a) Absorber plate b) enclosure c) insulation d) flow passage

SECTION – B

Answer any two questions

2 x 2 = 4

6. What is the effect of dust on flat plate collectors? **CO2**
7. What is the effect of shading on flat plate collectors? **CO2**
8. Write down the main components of flat plate collectors **CO2**
9. List out the applications of solar energy **CO5**

SECTION – B

Answer any one question

1 x 6 = 6

10. Write a shot note on typical air collector **CO2**
11. Give a brief account on a typical liquid collector **CO2**

SECTION – D

Answer any one question

1 x 10 = 10

12. Explain about the selection materials for flat plate collectors **CO2**
13. Discuss briefly about solar furnace in detail. **CO5**



VIVEKANANDA COLLEGE, TIRUVEDAKAM WEST - 625234

DEPARTMENT OF PHYSICS

Course Code: 06SB51	Programme: B.Sc.,	CIA: II Test
Date: 30.08.2019	Major: PHYSICS	Semester: V
Time: 1Hr	Year: III	Maximum: 25 Marks
Course Title:	FIBRE OPTIC COMMUNICATION	

SECTION – A

Answer All questions

5 X 1 = 5 Marks

- For single mode fibres, average loss is _____ at $1.3\mu\text{m}$
a) 0.5dB b) 0.6dB c) 0.7dB d) 0.8dB
- During the CVD process, _____ is taken as base material.
a) Boron b) Polymer c) pure Silica d) Germanium
- The multi-element glasses are manufactured from very pure basic oxides and _____.
a) carbonates b) halides c) hydroxides d) bromides
- In multi-element glasses, the range of NA(Numerical Aperture) is
a) 0.2 to 0.6 b) 0.2 to 0.5 c) 0.2 to 0.8 d) 0.2 to 0.4
- Vicor glass is
a) 94% Silica 6% BO_3 b) 96% Silica 4% BO_3 c) 94% BO_3 6% Silica d) 96% BO_3 4% Silica

SECTION – B

Answer any TWO questions

2 X 2 = 4 Marks

- Draw the basic structure of stepped index.
- What is the disadvantage of mono mode fibre?
- Draw the schematic diagram of Axial Vapour Deposition.
- Draw the schematic flow chart of PHASIL system.

SECTION – C

Answer any ONE question

1 X 6 = 6 Marks

- Differentiate Stepped index and Graded index.
- Discuss about External Chemical Vapour Deposition.

SECTION – D

Answer any ONE question

1 X 10 = 10 Marks

- With diagrams explain Internal Chemical Vapour Deposition.
- AlGaAs double hetero-structure light emitter along with energy band diagram and refractive index profile and explain.



VIVEKANANDA COLLEGE, TIRUVEDAKAM WEST - 625234**DEPARTMENT OF PHYSICS**

Course Code: 06AT01	Programme: B.Sc.,	CIA: III Test
Date: 14.10.2019	Major: MATHS / CHEMISTRY	Semester: I
Time: 2Hrs	Year: I	Maximum: 50 Marks
Course Title:	ALLIED PHYSICS - I	

SECTION – A**Answer all questions****10 X 1 = 10 Marks**

- CO 3 1** The unit of entropy is _____
a) JK b) JKg⁻¹ c) JK⁻¹ d) J/Sec
- CO 3 2** First Law of thermodynamics is based on the principle of conservation of _____ of a system
a) Angular momentum b) energy c) linear momentum d) force
- CO 3 3** Which of the following device which converts heat into work?
a) Heat engine b) Carnot engine c) steam engine d) all of the above
- CO 3 4** Entropy is a measure of
a) perfect order b) available energy c) disorder d) none of the above
- CO 3 5** An engine works between the temperatures 30 K and 300 K. What its efficiency?
a) 50% b) 47% c) 90% d) 10 %
- CO 2 6** The ratio of a force to a length is
a) Viscosity b) elasticity c) surface tension d) none of the above
- CO 2 7** The dimensional formula of surface tension is
a) MT⁻¹ b) MT⁻² c) MT⁻³ d) M/T²
- CO 2 8** The coefficient of viscosity is represented by a letter
a) ε b) λ c) η d) σ
- CO 2 9** The flow is steady or streamlined only as long as the velocity of the liquid does not exceed limiting value, called _____
a) Escape velocity b) orbital velocity c) terminal velocity d) critical velocity
- CO 2 10** The period of oscillation of a torsion pendulum is independent of
a) Its mass b) rigidity modulus of the wire
c) acceleration due to gravity at the place d) the dimensions of the oscillating body

SECTION – B**Answer any FIVE questions****5 x 2 = 10 Marks**

- CO 5 11** What is spherical aberration?
- CO 3 12** State Zeroth law of thermodynamics
- CO 3 13** Define entropy.
- CO 2 14** What do you mean by streamline flow?

- CO 2 15 Define coefficient of viscosity.
- CO 2 16 Define critical velocity of a liquid.
- CO 2 17 Define surface tension of a liquid.

SECTION – C **Answer any THREE question** **3 x 6 = 18 Marks**

- CO 3 18 Explain the change in entropy in a reversible process.
- CO 5 19 Two thin lenses of focal lengths f_1 and f_2 separated by a distance d have an equivalent focal length 50 cm. The combination satisfies the conditions for no chromatic aberration and minimum spherical aberration. Find the values of f_1 and f_2 and d . Assume that both the lenses are of the same material
- CO 2 20 . Derive the dimensional formula of coefficient of viscosity.
- CO 2 21 Derive an expression for the period of oscillation of a torsion pendulum.
- CO 2 22 Describe the Jaeger’s method to determine the surface tension of the given liquid.

SECTION – D **Answer any ONE question** **1 x 12 = 12 Marks**

- CO 5 23 Derive the condition for minimum spherical aberration of two thin lenses separated by a distance.
- CO 2 24 Derive the Poiseuille’s formula for the rate of flow of a liquid through a capillary tube.



VIVEKANANDA COLLEGE, TIRUVEDAKAM WEST - 625234**DEPARTMENT OF PHYSICS**

Course Code: 06CT11	Programme: B.Sc.,	CIA: III Test
Date: 09.10.2019	Major: PHYSICS	Semester: I
Time: 2Hrs	Year: I	Maximum: 50 Marks
Course Title:	MECHANICS	

SECTION – A**Answer all questions****10 X 1 = 10 Marks**

- CO 2 1** An object moves around a circle. If the radius is doubled keeping the speed the same then the magnitude of the centripetal force must be:
a) twice as great b) half as great c) four times as great d) one-fourth as great
- CO 2 2** If a satellite moves above Earth's atmosphere in a circular orbit with constant speed, then:
a) its acceleration and velocity are always in the same direction
b) the net force on it is zero
c) its velocity is constant
d) its acceleration is toward the Earth
- CO 3 3** The physical quantity "impulse" has the same dimensions as that of:
a) force b) power c) energy d) momentum
- CO 3 4** The resultant force acting on the body is equal to the rate of change of _____ of the body
a) position b) velocity c) momentum d) acceleration
- CO 3 5** When the net external force acting on a system is zero, the total linear momentum of the system will be _____
a) zero b) constant c) increasing d) decreasing
- CO 3 6** If the net external force on a system of particles is zero, then the centre of mass of the system moves with constant _____
a) velocity b) acceleration c) mass d) momentum
- CO 3 7** The momentum of an object at a given instant is independent of its:
a) mass b) speed c) acceleration d) velocity
- CO 3 8** The centre of mass of a system of particles has a constant velocity if:
a) the forces exerted by the particles on each other sum to zero
b) the external forces acting on particles of the system sum to zero
c) the velocity of the centre of mass is initially zero
d) the particles are distributed symmetrically around the centre of mass
- CO 3 9** In centre of mass reference frame, the total momentum of the colliding particles is _____ both before and after collision
a) constant b) same c) zero d) indeterminate
- CO 3 10** A projectile in flight explodes into several fragments. The total momentum of the fragments immediately after this explosion:
a) is the same as the momentum of the projectile immediately before the explosion
b) has been changed into kinetic energy of the fragments
c) is less than the momentum of the projectile immediately before the explosion
d) is more than the momentum of the projectile immediately before the explosion

SECTION – B **Answer any FIVE questions** **5 x 2 = 10 Marks**

- CO 3 11 What are impulsive forces?
- CO 3 12 State impulse momentum theorem
- CO 3 13 State law of conservation of momentum.
- CO 3 14 Express Newton's second law of motion in terms of momentum.
- CO 3 15 How translational motions of a system of particles are analyzed?
- CO 2 16 Differentiate between static friction and kinetic friction.
- CO 4 17 How angular momentum and angular velocity is related?

SECTION – C **Answer any THREE question** **3 x 6 = 18 Marks**

- CO 4 18 Calculate the work done by a variable force.
- CO 3 19 A certain Dc-9 airplane has a mass of 50,000 kg and a cruising velocity of 700 km, Its engines develop a total thrust of 70,000 N If air resistances, change in altitude and fuel consumption are ignored, how long does it take the airplane to reach its cruising velocity, starting from rest?
- CO 3 20 Explain different types of two body collisions using momentum conservation.
- CO 5 21 Derive an expression for rotational speed of a rotor necessary to prevent falling.
- CO 3 22 A ball of 0.4 kg mass and a speed of 3 m/s have a head on, completely elastic collision with a 0.6 kg initially at rest. Find the speeds of both bodies after the collision.

SECTION – D **Answer any one question** **1 x 12 = 12 Marks**

- CO 4 23 Derive Work- energy theorem and explain its significance.
- CO 2 24 Arrive at the equation to calculate the period of motion of a conical pendulum



VIVEKANANDA COLLEGE, TIRUVEDAKAM WEST - 625234**DEPARTMENT OF PHYSICS**

Course Code: 06CT12	Programme: B.Sc.,	CIA: III Test
Date: 12.10.2019	Major: PHYSICS	Semester: I
Time: 2Hrs	Year: I	Maximum: 50 Marks
Course Title:	ELECTROMAGNETISM	

SECTION – A**Answer All questions****(10 X 1 = 10 Marks)**

- Why Kelvin Bridge is known as double bridge? **CO3**
a) two power supplies b) two unknowns c) two ratio arms d) none of the above
- Basically a potentiometer is a device for **CO3**
a) comparing two voltages b) measuring current
c) comparing two currents d) measuring a voltage
- Standardization of potentiometer is used for **CO3**
a) accuracy b) accuracy in measurement
c) use of low voltages sources d) none of the above
- A magnetic field exists around **CO4**
a) iron b) copper c) aluminium d) moving charges
- Which of the following is a vector quantity? **CO4**
a) relative permeability b) magnetic field intensity
c) flux density d) magnetic potential
- The SI unit of magnetic induction B is **CO4**
a)Wbm² b)Wb/m² c)Weber d) Wb/m³
- The Biot-Savart's law is a general modification of **CO4**
a) Kirchhoffs law b) Lenz's law c) Ampere's law d) Faraday's laws
- Magnetic moment is a **CO4**
a) pole strength b) universal constant c) scalar quantity d) vector quantity
- The SI unit of Magnetic flux is **CO4**
a) Wbm² b)Wb/m² c)Weber d) Wb/m³
- The bar magnet has **CO4**
a) the dipole moment b) monopole moment c) a and b both (d) none of the above

SECTION – B**Answer any FIVE questions****5 x 2 = 10 Marks**

- Draw the circuit diagram for capacitance of a capacitor **CO3**
- State Maxwell's cork screw rule **CO4**
- Define the term magnetic field **CO4**
- Write a note on magnetic flux **CO4**
- Explain the Lorentz force on a moving charge **CO4**
- State the Ampere's swimming rule **CO4**
- Find the magnetic induction at the centre of a square current loop of side 1 metre carrying a current of 1 ampere **CO4**

SECTION – C**Answer any THREE questions****3 x 6 = 18 Marks**

- With a suitable diagram, explain the calibration of ammeter using potentiometer **CO3**
- Explain the comparison of capacitances of two capacitors with suitable diagram **CO3**
- Give a note on definition of B and explain Fleming's left hand rule **CO4**
- A square coil of side **d** carries a current **i**. Calculate the magnetic induction at the centre of the coil **CO4**
- State and explain the Biot-Savart law **CO4**

SECTION – D**Answer any ONE questions****1 x 12 = 12 Marks**

- Describe the measurement of low resistance using kelvin double bridge method with suitable diagram **CO3**
- Derive an expression for the magnetic induction at a point due to a straight conductor carrying current **CO4**



VIVEKANANDA COLLEGE, TIRUVEDAKAM WEST - 625234

DEPARTMENT OF PHYSICS

Course Code: 06CT31	Programme: B.Sc.,	CIA: III Test
Date: 09.10.2019	Major: PHYSICS	Semester: III
Time: 2Hrs	Year: II	Maximum: 50 Marks
Course Title:	PRINCIPLES OF ELECTRIC CIRCUITS	

SECTION – A

Answer all questions

10 X 1 = 10 Marks

- CO 1 1** Ideal voltage source has an internal resistance of
 a) zero b) infinite c) mega ohm d) milli ohm
- CO 1 2** Maximum power is delivered across the load when
 a) $R_S = R_L$ b) $R_S > R_L$ c) $R_L > R_S$ d) $R_L \neq R_S$
- CO 2 3** The polar form of the complex number $8 + j6$ is
 a) $10 \angle 36.87^\circ$ b) $10 \angle -36.87^\circ$ c) $12 \angle 28.36^\circ$ d) $11 \angle 36.87^\circ$
- CO 2 4** If the peak value of a sine wave is 20 V, the peak to peak value is
 a) 20 V b) 10 V c) 5V d) 30 V
- CO 3 5** The Ohms law for the current I in RC circuit is
 a) $\frac{V}{Z}$ b) VZ c) $\frac{Z}{V}$ d) IZ
- CO 3 6** Power in a capacitor, called
 a) average power b) apparent power c) capacitive power d) reactive power
- CO 4 7** The inductive reactance of RL circuit is
 a) $2\pi f L$ b) $\frac{1}{2\pi f L}$ c) $2\pi f C$ d) $\frac{1}{2\pi f C}$
- CO 4 8** Current _____ voltage in an RL circuit
 a) equals b) leads c) lags d) not equals
- CO 5 9** The phase angle between the source voltage and current of a series RLC circuit at Resonance is
 a) -90° b) $+90^\circ$ c) 0° d) dependent on the reactance
- CO 5 10** Band width of the resonant filter is
 a) $\frac{f_r}{Q}$ b) $\frac{XL}{Q}$ c) $\frac{XC}{Q}$ d) $\frac{Q}{f_r}$

SECTION – B

Answer any FIVE questions

5 x 2 = 10 Marks

- CO 1 11** Define series – parallel resistive circuit.
- CO 1 12** State maximum power transfer theorem.
- CO 2 13** What is phasor?
- CO 2 14** Convert $8 + j6$ to polar form.
- CO 3 15** Define conductance, capacitive susceptance and admittance.
- CO 4 16** Calculate the power factor when $\theta = 50^\circ$.
- CO 5 17** What is critical frequency?

SECTION – C

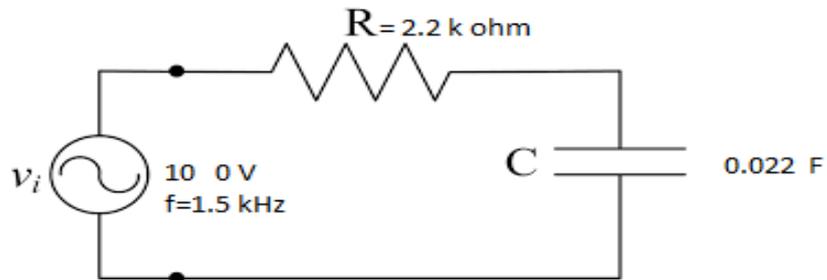
Answer any THREE question

3 x 6 = 18 Marks

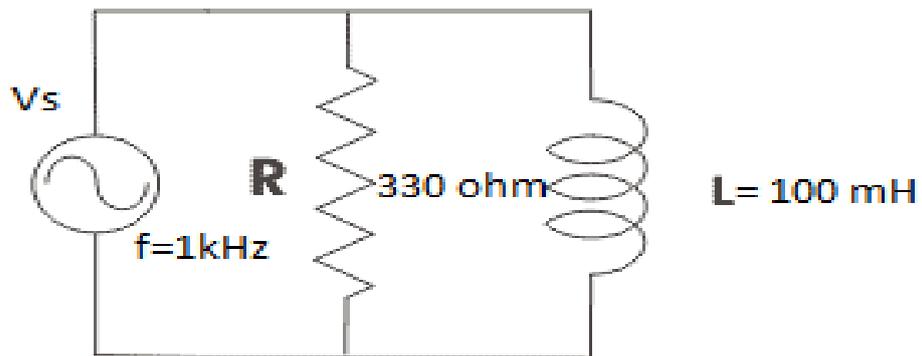
CO 1 18 Explain Thevenin's theorem

CO 2 19 Subtract $1 + j2$ from $3 + j4$ ii) Divide $100 \angle 50^\circ$ by $25 \angle 20^\circ$

CO 3 20 Determine the current in the following circuit and draw a phasor diagram showing the relation between source voltage and current.



CO 4 21 Determine the total admittance and draw the admittance phasor diagram.



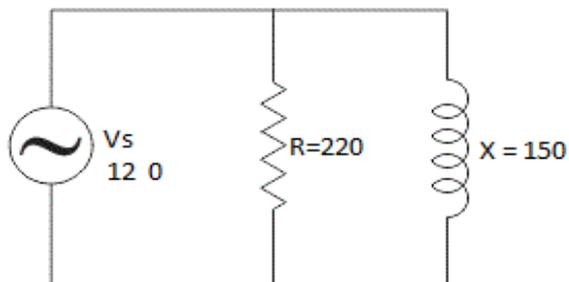
CO 5 22 Analyse the series RLC circuit.

SECTION – D

Answer any ONE question

1 x 12 = 12 Marks

CO 4 23 Determine the value of each current in the given circuit and draw the current phasor diagram.



CO 5 24 Analyse the operation of band pass and band stop filters.



DEPARTMENT OF PHYSICS

Course Code: 06CT32	Programme:	B.Sc.,	CIA: III Test
Date: 12.10.2019	Major:	PHYSICS	Semester: III
Time: 2Hrs	Year:	II	Maximum: 50 Marks
Course Title:	SPECTROSCOPY		

SECTION – A

Answer All questions

10 X 1 = 10 Marks

- The energy curve of a diatomic molecule under SHO model is a _____ **CO4**
 a) straight line b) circle c) parabola d) ellipse
- In anharmonic oscillator spectrum, spectral line near equilibrium oscillation frequency ω_e is called **CO4**
 a) fundamental absorption b) first overtone c) second overtone d) angular frequency
- Which among the following is a photoconductive detector used in infrared spectrometer? **CO4**
 a) Indium Antimonide b) Mercury Cadmium Telluride c) Lead Sulphide d) All the above
- The Selection rules for a harmonic oscillator undergoing vibrational changes is _____ **CO4**
 a) $\Delta v = \pm 1$ b) $\Delta v = 0, \pm 1$ c) $\Delta v = \pm 1, \pm 2$ d) $\Delta v = \pm 1, \pm 2, \pm 3$ etc.,
- ATR spectroscopy uses the principle of _____ **CO4**
 a) reflection b) polarisation c) refraction d) total internal reflection
- If energy is exchanged between photon and molecule during the collision, such collisions are called **CO5**
 a) elastic b) inelastic c) uniform d) nonuniform
- Which among the following molecules have polarizability ellipsoids of general tangerine shape? **CO5**
 a) All diatomic molecules b) Linear polyatomic molecules c) Both (a) & (b) d) Neither (a) nor (b)
- Ideal source for Raman spectrometer is _____ **CO5**
 a) Lasers b) Glass c) Quartz d) Sodium Chloride
- Pure rotations of spherical top molecules are completely _____ in the Raman **CO5**
 a) inactive b) active c) unobservable d) irrelevant
- Raman spectroscopy is effectively observable in _____ **CO5**
 a) IR region b) visible or ultraviolet region c) microwave region d) radio waves region

SECTION – B

Answer any FIVE questions

5 x 2 = 10 Marks

- Write down the expression for oscillation frequency in Hz and cm^{-1} under SHO model. **CO4**
- What are 'hot bands'? **CO4**
- What is Born-Oppenheimer approximation in the context of diatomic vibrating rotator? **CO4**
- How energy of a vibrating diatomic molecule executing SHO is expressed? **CO4**
- Differentiate Stokes and anti-Stokes radiation. **CO5**
- What are the selection rules for Raman Spectra of symmetric top molecules? **CO5**
- Why lasers are preferred as ideal sources in Raman Spectrometers? **CO5**

SECTION – C

Answer any THREE questions

3 x 6 = 18 Marks

- Describe the components of the spectrometer assembled for infrared work. **CO4**
- Explain the principle and working of ATR spectroscopy. **CO4**
- Define Rayleigh scattering and Raman scattering. Explain Raman effect on the basis of Quantum theory. **CO5**
- In the near infrared spectrum of HCl molecule there is single intense band at 2885.9 cm^{-1} . **CO4**
 Assume that it is due to the transition between vibrational levels, show that the force constant k is 480 N/m.
- The exciting line in an experiment is 5460 \AA and the Stokes line is at 5520 \AA .
 Find the wavelength of anti-Stokes line. **CO5**

SECTION – D

Answer any ONE question

1 x 12 = 12 Marks

- Explain how anharmonic oscillator differs from simple harmonic oscillator. Discuss the vibrational energy levels for transitions from $v = 0$ to $v = 1, 2$ and 3 . **CO4**
- Explain the rotational energy levels of a linear molecule and the rotational Raman spectrum arising from transitions between them. **CO5**



DEPARTMENT OF PHYSICS

Course Code: 06CT51	Programme: B.Sc.,	CIA: III Test
Date: 10.10.2019	Major: PHYSICS	Semester: V
Time: 2Hrs	Year: III	Maximum: 50 Marks
Course Title:	SOLID STATE PHYSICS	

SECTION – A

Answer All questions

10 X 1 = 10 Marks

- A plastic deformation of a crystal is possible due to
 - Schottky defect
 - point defects
 - Frenkel defect
 - the motion of dislocations in the crystal
- Errors in charge distribution in ionic crystals are called
 - point defects
 - line defects
 - electronic defects
 - volume defects
- A grain boundary is
 - combination of edge dislocation and screw dislocation
 - a point defect
 - the region where the crystal orientation changes gradually
 - the region where the crystal orientation changes sharply
- The area of hysteresis loop of a ferromagnetic material gives
 - the coercive force
 - the remanent flux density
 - the intensity of magnetisation of the material
 - the energy that is consumed in taking the material through the complete cycle of magnetisation
- Ferrox cube is the commercial name of
 - ferromagnetic materials
 - paramagnetic materials
 - ferromagnetic materials
 - diamagnetic materials
- Magnetic ceramics are
 - diamagnetic materials
 - paramagnetic materials
 - ferromagnetic materials
 - ferrimagnetic materials
- The dimension of ferromagnetic domains is in the order of
 - 10^6 m
 - 10^{-9} m
 - 10^{-6} m
 - 10^{-3} m
- The unit for relative permittivity is
 - Hm^{-1}
 - Fm^{-1}
 - Cm^{-1}
 - dimensionless
- Choose the correct relation
 - $E = \epsilon_0 (\epsilon_r - 1) P$
 - $D = \epsilon_0 (\epsilon_r - 1) E$
 - $P = \epsilon_0 (\epsilon_r - 1) E$
 - $\epsilon_r = (\chi - 1)$
- Insertion of a dielectric material between the plates of a capacitor
 - increases the capacitance
 - decrease the capacitance
 - results in no change in capacitance
 - none of these

SECTION – B

Answer any FIVE questions

5 x 2 = 10 Marks

- What does Burgers vector signify?
- Mention two types of line imperfections.
- Define the term domains
- State Magnetostriction
- What is hysteresis loss?
- Write a note on magnetic ceramics
- Explain Polarizability

SECTION – C

Answer any THREE questions

3 x 6 = 18 Marks

- Explain various surface imperfections.
- The fraction of vacancy sites in a metal is 1×10^{-10} at 500°C . What will be fraction of vacancy sites at 1000°C ?
- Explain the domain theory of ferromagnetism
- The saturation magnetic induction of nickel is 0.65 wb/m^2 . If the density of nickel is 8906 kg/m^3 and its atomic weight is 58.7, calculate the magnetic moment of the nickel atom in Bohr magneton.
- Differentiate between hard and soft magnetic materials

SECTION – D

Answer any ONE question

1 x 12 = 12 Marks

- Obtain an expression for the density of Frenkel defects in ionic crystals.
- Give the brief theory of Paramagnetism.



Course Code: 06CT52	Programme: B.Sc.,	CIA: III Test
Date: 11.10.2019	Major: PHYSICS	Semester: V
Time: 2Hrs	Year: III	Maximum: 50 Marks
Course Title:	DIGITAL ELECTRONICS	

SECTION – A

Answer All questions

10 X 1 = 10 Marks

- Which of the following gate has a high output when an odd number of inputs are high?
a) OR gate b) NOR gate c) Ex-OR gate d) NAND gate
- A device which converts an active input signal into a coded output signal
a) encoder b) decoder c) multiplexer d) demultiplexer
- It is desired to display the digit 7 using a seven segment display. The LEDs to be turned on are
a) a,b,c b) b,c,d c) c,d,e d) a,b,d
- S₀ and S₁ pins are used for
a) serial communication b) indicating the processor's status
c) acknowledging the interrupt d) none of the above
- Total number of instructions in 8085 microprocessor assembly language is
a)244 b)245 c)246 d)247
- The voltage of a Schmitt trigger is
a) a low voltage b) a high voltage c) either a low or high voltage d) a sine wave
- An astable multivibrator has _____
a) one stable state b)two stable states c) no stable state d) none of the above
- Which of the following multivibrator is a square wave oscillator?
a) monostable b) astable c) bistable d) none of the above
- The output of the astable circuit _____.
a) constantly switches between two states b) is LOW until a trigger is received
c) is HIGH until a trigger is received d) floats until triggered
- How to obtain symmetrical waveform in Astable multivibrator?
a) Use clocked RS flip-flop b) Use clocked JK flip-flop
c) Use clocked D flip-flop d) Use clocked T flip-flop

SECTION – B

Answer any FIVE questions

5 x 2 = 10 Marks

- What is hysteresis in a Schmitt trigger?
- What is a monostable?
- Write the formula for LSB weight of binary weighted method.
- Compare between Pre-emphasis and De-emphasis.
- What is Encoder?
- What does the abbreviation BCD stand for?
- What is a LED?

SECTION – C

Answer any THREE questions

3 x 6 = 18 Marks

- Explain Exclusive OR gate detail.
- Describe briefly about seven segment decoder with circuit diagram.
- Explain the astable multivibrator circuit using 555 timer with neat circuit diagram.
- Find the carrier and modulating frequencies, the modulation index, and the maximum deviation of the FM wave represented by the voltage equation $v = 12 \sin(6 \times 10^8 t + 5 \sin 1250 t)$. What powers will this FM wave dissipate in a 10 Ω resistor?
- Write an assembly language program to find two's complement of an 8 bit number with flow chart.

SECTION – D

Answer any ONE question

1 x 12 = 12 Marks

- Explain the generation of frequency modulation by direct method.
- Explain 8085 instruction set in detail.



DEPARTMENT OF PHYSICS

Course Code: 06EP51	Programme: B.Sc.,	CIA: III Test
Date: 12.10.2019	Major: PHYSICS	Semester: V
Time: 2Hrs	Year: III	Maximum: 50 Marks
Course Title:	OBJECT ORIENTED PROGRAMMING WITH C++	

SECTION – A

Answer All questions

10 X 1 = 10 Marks

1. C++ provides a special _____ called the constructor, which enables an object to initialize itself when it is created.
A) friend function B) member function C) public function D) private function
2. A constructor has the same _____ as that of class.
A) variable B) object C) function D) name
3. We can overload almost all the C++ operators except the following.
i) Class member operator (.,*) ii) Assignment operator (=)
iii) Scope resolution operator (::) iv) Conditional operator (?:)
A) i, ii and iii only B) ii, iii and iv only C) i, iii and iv only D) All i, ii, iii and iv
4. A derived class with only one base class is called _____ inheritance
a) single b) multilevel c) multiple d) hybrid
5. The mechanism of deriving a new class from an old one is called _____
a) polymorphism b) inheritance c) base class d) derived class
6. Which access type data gets derived as private member in derived class:
a) Private b) Public c) Protected d) Protected and Private
7. Members which are not intended to be inherited are declared as:
a) Public members b) Protected members c) Private members d) Private or Protected members
8. _____ class is not used to create object.
a) abstract d) base c) derived d) all the above
9. A class can contain objects of other classes is known as _____
a) virtual base class b) containership c) single inheritance d) polymorphism
10. When the properties of one class are inherited by more than one class is called _____ inheritance
a) single b) multiple c) multilevel d) hierarchical

SECTION – B

Answer any FIVE questions

5 x 2 = 10 Marks

11. What is the function of destructor?
12. What is operator overloading?
13. How many arguments is(are) required in the definition of an overload unary operator using friend function?
14. Write down any two rules for overloading operators.
15. What are the different forms of Inheritance?
16. Write down the general form of Multiple Inheritance.
17. What do you mean by Abstract Class?

SECTION – C

Answer any THREE questions

3 x 6 = 18 Marks

18. Write a program to find volume of the Cube, Cylinder and Rectangular parallelepiped using function overloading.
19. Write a program to implement constructor and destructor.
20. Write a program using overloading unary minus operator.
21. Write a program to implement single inheritance.
22. Write a program to multiply two numbers using “Multiple Inheritance”

SECTION – D

Answer any ONE question

1 x 12 = 12 Marks

23. With example explain the conversion from a) Basic to Class type b) Class to Basic type [6+6 marks]
24. a) Write down the general form of defining derived class. b) Sketch the various forms of Inheritance
c) Sketch the pictorial representation for the two levels of derivation (ie., Effect of inheritance on the visibility of members.) [2+4+6 marks]



VIVEKANANDA COLLEGE, TIRUVEDAKAM WEST - 625234**DEPARTMENT OF PHYSICS**

Course Code: 06NE11	Programme:	B.A., & B.Sc.,	CIA: I Test
Date: 10.10.2019			Semester: I
Time: 2Hrs	Year:	I	Maximum: 50 Marks
Course Title:	Space Science		

SECTION – A**Answer ALL questions****10 X 1 = 10 Marks**

- Which is the brightest planet in the universe? **CO1**
a. Mercury b. Venus c. Earth d. Saturn
- What is the gap between the orbit of Mars and Jupiter called? **CO1**
a. Asteroids b. Comets c. Meteor d. Meteorite
- Which is the farthest planet of solar system? **CO2**
a. Neptune b. Jupiter c. Mercury d. Earth
- Who discovered laws of planetary orbits? **CO2**
a. Galileo Galilei b. Nicholas Copernicus c. Johannes Kepler d. Issac Newton
- Unwanted signal that distorts a transmitted signal is called **CO3**
a. noise b. modulation c. amplification d. attenuation
- A wave of frequency 1 GHz has wavelength of **CO3**
a. 0.1 m b. 0.3 m c. 0.4 m d. 0.5 m
- If frequency of modulated wave is less than frequency of carrier wave, then input signal is **CO4**
a. negative b. positive c. zero d. infinite
- Variation in amplitude or frequency of carrier wave is called **CO4**
a. amplitude modulation b. frequency modulation c. modulation d. bandwidth
- A satellite signal transmitted from transponder to earth's station is **CO5**
a. uplink b. downlink c. terrestrial d. earth bound
- A geosynchronous satellite **CO5**
a. has the same period as that of the Earth b. has a circular orbit
c. rotates in the equatorial plane d. has all of the above

SECTION – B**Answer any FIVE questions****5 x 2 = 10 Marks**

- How many planets are there in solar system and how are they broadly classified? **CO1**
- What are the outer planets in the solar system? **CO2**
- State the two basic modes of communication. **CO3**
- Explain the term – amplification. **CO4**
- What is a payload? **CO5**
- Differentiate between stars and planets. **CO2**
- Mention the two basic types of electrical signal. **CO3**

SECTION – C**Answer any THREE questions****3 x 6 = 18 Marks**

- Elucidate in detail why mars is called as “The Red planet”. **CO1**
- Illustrate in detail about the formation of the Solar system. **CO2**
- What is bandwidth? Explain the significance signal bandwidth. **CO3**
- Explain the significance of optical fibres in communication systems. **CO4**
- Elucidate in detail how a satellite communication system works. **CO5**

SECTION – D**Answer any ONE question****1 x 12 = 12 Marks**

- Explain the essential components of communication system and various signal types and their characteristics. **CO3**
- Explain various stages of launching of a Satellite, different types of Satellite launch vehicles and classification of earth orbit satellites. **CO5**

VIVEKANANDA COLLEGE, TIRUVEDAKAM WEST - 625234**DEPARTMENT OF PHYSICS**

Course Code: 06SB31	Programme: B.Sc.,	CIA: III Test
Date: 08.10.2019	Major: PHYSICS	Semester: III
Time: 1Hr	Year: II	Maximum: 25 Marks
Course Title:	SOLAR ENERGY	

SECTION – A**Answer all questions****5 X 1 = 5 Marks**

- CO 5 1 Which of the following country launched mission which was totally powered by solar cell
a) United States b) Russia c) India d) China
- CO 5 2 Solar cells are connected and are often placed into a sealed glass or plastic unit called
a) Array b) Modules c) phonons d) absorber
- CO 4 3 Name the organisation has done pioneering work to promote non-renewable energy sources with its panel being displayed at a number of demonstration project sites.
a) ISRO b) CEL c) BARC d) SSPL
- CO4 4 A fixed array is usually oriented _____direction.
a)South West b) East west c) North east d) North south
- CO4 5 Silicon is the most common element on the earth and is usually obtained from
a) Graphite b) Sand c) Rock d) Charcoal

SECTION – B**Answer any two questions****2 x 2 = 4 Marks**

- CO 3 6 Mention some possible concentrating system used in solar collectors.
- CO 3 7 What is focusing collector?
- CO 4 8 Name the institutions have contributed to the development of photovoltaic technology in India
- CO 4 9 List out the types of solar cells

SECTION – C**Answer any one question****1 x 6 = 6 Marks**

- CO 4 10 Write down the advantages and disadvantages of Photovoltaic solar energy conversion.
- CO 3 11 Draw some possible focusing system configurations.

SECTION – D**Answer any one question****1 x 10 = 10 Marks**

- CO 5 12 Illustrate the Box type solar cooker with neat diagram
- CO 4 13 Discuss briefly about the applications of solar photovoltaic system



VIVEKANANDA COLLEGE, TIRUVEDAKAM WEST - 625234

DEPARTMENT OF PHYSICS

Course Code: 06SB51	Programme: B.Sc.,	CIA: III Test
Date: 08.10.2019	Major: PHYSICS	Semester: V
Time: 1Hr	Year: III	Maximum: 25 Marks
Course Title:	FIBRE OPTIC COMMUNICATION	

SECTION – A

Answer All questions

5 X 1 = 5 Marks

- In Avalanche Photo Diode (APD) n^+ and p^+ are _____doped semiconductors.
a) Lightly b) heavily c) un d) both a and b
- C_D is the Photo-Diode _____
a) Junction capacitance b) Junction detector c) Detector Capacitance d) detector
- Photo-Transistors have limited bandwidth of only about _____ KHz
a) 200 b) 300 c) 400 d) 500
- Amplifier input capacitance is designated by _____
a) C_a b) a_c c) C_{in} d) none
- Phase Modulators have bandwidths around _____ MHz
a) 100 b) 200 c) 300 d) 400

SECTION – B

Answer any TWO questions

2 X 2 = 4 Marks

- Draw the diagram of reversed biased P-N Junction diode.
- Write down the formula for responsivity of the reversed biased P-N Junction diode.
- What are the two classifications of fibre optic receiver?
- In Digital Laser Transmitter, which type of technique is used?

SECTION – C

Answer any ONE question

1 X 6 = 6 Marks

- With diagram briefly explain Digital Laser Transmitter.
- Discuss about Photo-Transistor.

SECTION – D

Answer any ONE question

1 X 10 = 10 Marks

- Discuss about Avalanche Photo Diode.
- Draw the classification table of optical transmitters and explain.

