

ASSIGNMENT 1
M.Sc. DEGREE EXAMINATION, MAY - 2020
PHYSICS
First Year
Mathematical Physics
MAXIMUM MARKS :30
ANSWER ALL QUESTIONS

- Q1)** Obtain the series solution of Hermite differential equation.
- Q2)** Obtain the generating function for Laguerre polynomial.
- Q3)** Obtain the Cauchy - Riemann equations.
- Q4)** Define analytic function and show that e^z is non - analytic any where
- Q5)** State and explain Taylor's theorem.
- Q6)** Expand $\frac{1}{z}$ in a Laurent series valid for $0 < |z| < \infty$
- Q7)** Explain the classification of cartesian tensors.
- Q8)** Write a note on symmetric and antisymmetric tensors.

ASSIGNMENT 2
M.Sc. DEGREE EXAMINATION, MAY - 2020
PHYSICS
First Year
Mathematical Physics
MAXIMUM MARKS :30
ANSWER ALL QUESTIONS

- Q1)** Obtain the covariant derivatives of tensor.
- Q2)** Obtain the Laplacian operator in Riemann Space.
- Q3)** Explain the first and second shifting theorems of Laplace Transform.
- Q4)** Obtain the FT of delta function.
- Q5)** Find the FT of
- Q6)** Write any Two of the following :
- a) Show that .
 - b) State and explain cauchy's integral formula.
 - c) Write a note on Associated tensors.
 - d) Half - wave expansions.



ASSIGNMENT 1
M.Sc. DEGREE EXAMINATION, MAY - 2020
PHYSICS
First Year

Classical Mechanics and Statistical Mechanics

MAXIMUM MARKS :30

ANSWER ALL QUESTIONS

- Q1)* State and explain principle of virtual work.
- Q2)* Derive Lagranges equation from Hamilton's principle.
- Q3)* Explain the rate of change of a vector in a moving frame of reference.
- Q4)* Explain the Torque free motion of rigid body.
- Q5)* Obtain the Lagrangian formulation of relativistic mechanics.
- Q6)* Write a note on canonical transformations
- Q7)* Obtain the Hamilton - Jacobi equations from Hamilton's principle.
- Q8)* Explain the frequencies of free vibration and normal coordinates.

ASSIGNMENT 2
M.Sc. DEGREE EXAMINATION, MAY - 2020
PHYSICS
First Year
Classical Mechanics and Statistical Mechanics
MAXIMUM MARKS :30
ANSWER ALL QUESTIONS

- Q1)** State and explain equipartition theorem.
- Q2)** What is Gibb's paradox? How it can be resolved?
- Q3)** Explain the energy fluctuations in canonical ensemble.
- Q4)** Obtain the equivalence between the canonical ensemble and grand canonical ensemble.
- Q5)** Explain the postulates of quantum statistical mechanics.
- Q7)** Explain the classical limit of the partition function and variational principle.
- Q8)** Explain the theory of white dwarf stars.
- Q9)** Write a note on Bose - Einstein condensation.
- Q10)** Answer any Two of the following :
- a) Cyclic coordinates.
 - b) Lagrange and poisson brackets.
 - c) Density fluctuational in grand canonical ensemble.
 - d) Darwin Fowlar method.



ASSIGNMENT 1

M.Sc. DEGREE EXAMINATION, MAY - 2020

(First Year)

PHYSICS

Quantum Mechanics

MAXIMUM MARKS :30

ANSWER ALL QUESTIONS

- Q1)** Explain the difference between classical and quantum mechanics and explain the functions and operators.
- Q2)** Explain the degenerate Eigen functions and discuss the degree of degeneracy.
- Q3)** Explain the Eigen functions of computing operators and related theorems.
- Q4)** State and explain uncertainty principle.
- Q5)** Obtain the solution of wave equation for particle moving in one dimension in a constant potential field with finite walls.
- Q6)** Explain the stark effect in hydrogen atom.
- Q7)** Explain the ground state of Helium atom using variation method.
- Q8)** Explain WKB method.

ASSIGNMENT 2

M.Sc. DEGREE EXAMINATION, MAY - 2020

(First Year)

PHYSICS

Quantum Mechanics

MAXIMUM MARKS :30

ANSWER ALL QUESTIONS

- Q1)* Define angular momentum operator and obtain the computation relations.
- Q2)* Obtain the explicit matrices for J_x , J_y and J_z .
- Q3)* Obtain Clebsch Gordon coefficients.
- Q4)* State and explain Wigner- Eekart theorem.
- Q5)* Obtain the equations of motion in Schrodinger's picture.
- Q6)* Obtain the Klein Goodon equation to hydrogen atom.
- Q7)* Explain Dirac matrices.
- Q8)* Obtain the Dirac's equation in the presence of Electromagnetic field.
- Q9)* Write notes on any Two of the following :
- Time dependent wave equation for a rigid rotator.
 - Einstein Transition probabilities.
 - Pauli's spin matrices.
 - Negative energy states.



ASSIGNMENT 1

M.Sc. DEGREE EXAMINATION, MAY - 2020

First Year

PHYSICS

Electronics

MAXIMUM MARKS :30

ANSWER ALL QUESTIONS

- Q1)** Explain how Op-Amp can be used as inverting and non-inverting amplifier.
- Q2)** Explain the effect of feed back on closed loop gain and input resistance.
- Q3)** Explain the working of phase sly oscillator.
- Q4)** Explain the operation of class AB amplifier.
- Q5)** Explain the TEM wave in the coaxial line resonant cavities.
- Q6)** Explain the operation of Magnetron.
- Q7)** Define frequency modulation and explain the production of FM waves.
- Q8)** Explain the working of superheterodyne receiver.

ASSIGNMENT 2

M.Sc. DEGREE EXAMINATION, MAY - 2020

First Year

PHYSICS

Electronics

MAXIMUM MARKS :30

ANSWER ALL QUESTIONS

- Q1)** State and explain Demorgen theorems.
- Q2)** Explain the working of multiplexer encoder.
- Q3)** Explain the working of Master Slave flip-flop and D-Flip-flop.
- Q4)** Explain A/D and D/A conversion.
- Q5)** Explain the instruction set of 8085.
- Q6)** Write an ALP for subtraction of two 8 bit numbers.
- Q7)** Explain the architecture of 8086.
- Q8)** Explain the addressing modes of 8086.
- Q9)** Write any Two of the following :
- a) CMRR.
 - b) TV transmission and reception.
 - c) Sample and hold circuits.
 - d) Addressing modes of 8085.

