

M.Sc I<sup>st</sup> sem ATKIT, 2020

Physics

Paper I Mathematical physics

Max marks = 85  
Min " = 31

Note: Attempt all questions. All questions carry equal marks.

Q.1. What are recursion relations. Explain!

Q.2. Explain curvilinear coordinate system.

Q.3. Give Fourier integral transform with example.

Q.4. What are Green's functions for one dimensional problem explain!

Q.5. Give Cauchy's Riemann equations with example.

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Paper-II Classical mechanics. Min " 31  
Max marks 85

Q.1. Give Newtonian mechanics for one and many particle system.

Q.2. Describe D'Alembert's principle.

Q.3. Give the Hamiltonian Jacobi equation.

Q.4. Describe theory of small oscillations with example.

Q.5. Explain Invariance under Galilean transformation

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Paper - III

Quantum Mechanics - I

- Q-1. Give equation of continuity? Max. Marks = 85  
Min " = 31
- Q-2. Describe Linear Vector space and concept of Hilbert space.
- Q-3. Give solution of Schrodinger equation for a linear harmonic oscillator.
- Q-4. Describe eigen values and eigen functions of  $L^2$  and  $L_z$ .
- Q-5. Explain Non degenerate and degenerate cases?
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Paper - IV Electronic Devices.

- Q-1. Explain JFET, MOSFET. Max. Marks = 85  
Min " = 31
- Q-2. What are photonic devices, radiative and non-radiative transitions.
- Q-3. Explain ROM and RAM.
- Q-4. Explain Magneto optic and Acousto-optic effects.
- Q-5. Describe Piezo electric resonators and filters?
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