

Government College for women (Autonomous), Srikakulam.

Mid 2 Exam.

Paper 5: Modern physics (All MPC, MPCs, MPE) Date:03-04-2024

Marks:30M

Time :2hours

I. Answer **Any one** of the following.

1X8=8M

1. Obtain The expression for the energy of a particle in one Dimensional potential well Using. Schrodinger time independent wave equation? [OR]

2. Explain how the shell model accounts for the existence of magic numbers?

II. Answer **any three** questions.

3X4=12M

1. Eigenvalues and eigen functions.

2. Schrodinger time independent wave equation.

3. Cloud chamber.

4. Liquid drop model.

5. Postulates of quantum mechanics.

III. Answer All questions.

5X2=10M

1. Find The least energy of an electron Moving in the dimension In an infinitely High potential box Of width **1 Angstrom**, Given mass of an electron. **$9.11 \times 10^{-31} \text{Kg}$** and **$h = 6.63 \times 10^{-34} \text{ J-s}$**
2. **What is the mass number A of a nucleus, whose radius is $r = 2071 \text{ fermi}$? Given $r_0 = 1.3 \times 10^{-15} \text{ m}$**
3. **Explain nuclear mass?**
4. **Explain Physical significance of wave function ψ ?**
5. Write properties of wave function?

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Mid 2 Exam.

Paper C4: Waves & Oscillations

I B.Sc Physics Major Date:03-04-2024,AN

Marks:30M

Time :2hours

I. Answer anyone of the following.

1X8=8M

1. Write differential equation of damped harmonic oscillator? & Explain Critical damping and overdamping.

OR

2. Apply Fourier Theorem to Sawtooth wave?

II. Answer any three questions.

3X4=12M

1. Derive Fourier Coefficient A_r ?
2. Write short note on resonance?
3. Write difference between free vibrations and forced vibrations?
4. Explain about logarithmic decrement?
5. Explain D.E of forced vibrations?

III. Answer All questions.

5X2=10M

1. Define Q-Factor and write formula?
2. Write the limitations of Fourier theorem?
3. Define relaxation time and write formula?
4. Write examples of under damped?
5. Draw the diagram of triangular wave and write displacement y - values?