

Physics Assignment No. 2

Date of Submission: 13.08.2018

Class: EC1/EC2, EE1/EE2, EC3/EE3, CS4/CS5

Teacher In charge: Harpreet Kaur Grewal, Randhir Singh

Chapters: Mechanics and Mechanics of Solids, Quantum Mechanics, Physics of Materials.

INSTRUCTIONS:

- 1. Assignment is meant to be submitted by the students of above mentioned classes only.**
- 2. Submit the assignment on sheets properly compiled in a folder. Do not submit it on hard bound copy.**
- 3. Last date of submission will not be extended in any case.**
- 4. Assignments will not be evaluated if submitted after last date of submission.**
- 5. Marks of assignments will be added to final evaluation of Physics paper.**

Q1. Define the following: Inertia, Elasticity, Restoring force, Stress, Strain, Impedance, Resonance, Progressive waves, Standing Waves.

Q2. What are matter waves?

Q3. Discuss briefly de-Broglie hypothesis.

Q4. Show that de-Broglie waves can travel faster than light waves in vacuum.

Q5. Define uncertainty principle. Discuss any two applications of the uncertainty principle.

Q6. Give some failures of classical physics.

Q7. Define quantum physics and quantum mechanics.

Q8. What are electronic materials?

Q9. Define the following: dielectric, dielectric strength, dielectric breakdown.

Q10. What are ferroelectric materials? Discuss some of their applications.

Q11. What are magnetic and non magnetic materials? Compare the properties of dia, para and ferro magnetic substances.

Q12. Discuss briefly domain theory.

Q12. What are ferrites? Discuss in detail the applications of ferrites.

Q14. What is hysteresis? Based on B-H curve, classify magnetic materials.

Q15. Give differences amongst a conductor, an insulator, a semiconductor and a superconductor.

Q16. How does a superconductor differ from a perfect/ideal conductor?

Q17. What are nanomaterials? How are nanomaterials different from bulk materials?

Q18. Discuss in detail the applications and risks of nanotechnology. Also comment in brief, about the potential of nanotechnology in the near future.

Q19. What is a harmonic oscillator?

Q20. Solve the differential equation: $\frac{d^2x}{dy^2} + \omega^2 x = 0$ where x is a function of

y and $x=x_0$ when $y=0$.