**Reg. No. \_\_\_\_\_\_\_\_**

**Karunya University**

**(Karunya Institute of Technology and Sciences)**

(Declared as Deemed to be University under Sec.3 of the UGC Act, 1956)

**Supplementary Examination - June 2011**

**Subject Title: APPLIED PHYSICS Time: 3 hours**

**Subject Code: PH104 Maximum Marks: 100**

#### **Answer ALL questions**

**PART – A (10 x 1 = 10 MARKS)**

1. Which property distinguishes Laser from other sources of Light?

2. State symbolically the principle of optical fibre communication.

3. How much space in percentage is occupied by the atoms of F.C.C. structured metals?

4. What is Crystal?

5. What do you mean by dipole?

6. Name two super conducting materials.

7. Reverberation time should not be too high. Why?

8. What is the frequency index of ultrasonics?

9. Which has the lowest energy, an electron in the first energy level or third energy level?

10. What is the limitation of uncertainty principle?

**PART – B (5 x 3 = 15 MARKS)**

11. Write down the specific advantages of optical fibres.

12. Sketch (010), (110) and (111) planes corresponding to cubic system.

13. What is polarization in dielectrics?

14. What is the salient feature of Sabine’s formula?

15. How are the energy states of electron described by Quantum mechanics?

**PART – C (5 x 15 = 75 MARKS)**

16. a. What are the essential components employed for the production of LASER? Briefly explain the function of each. (5)

b. Describe with a sketch the construction and working of CO2 LASER. What are its special advantages? (10)

(OR)

17. a. Explain the propagation of light through fiber system. (8)

b. Clearly differentiate between Step and Graded Index fibers. (7)

18. a. Calculate geometrically the Atomic packing factor for B.C.C and H.C.P. unit cell, with the treatment for c/a ratio. (12)

b. Write down the names of the seven crystal systems with the relation connecting the angles between their axis. (3)

(OR)

19. a. What are miller indices? Explain the general principles to obtain the miller indices of a plane. (8)

b. Molybdenum has B.C.C structure and a density of 10.2 x 103 kg/m3. Calculate its atomic radius. At. wt. of Mo: 95.94. (7)

[P.T.O]

20. a. What is lossy Dielectrics? Discuss the Dielectric breakdown in solid Dielectrics. (7)

b. Describe an experiment to determine the Dielectric constant of solid Dielectrics. (8)

(OR)

21. Write short notes on the following:

a. High-temperature super conductors b. Piezo – electric materials

c. Shape – memory effect. (5+5+5)

22. Deduce the Sabine’s formula for Reverberation time.

(OR)

23. a. What is ultrasonics? State its properties. Describe the piezo-electric generator for producing. Ultra Sonics. (10)

b. Explain the application of Ultrasonics via Sonar. (5)

24. a. Derive De Broglie’s wave equation. Describe Davisson – Germer experimental verification of matter waves. (11)

b. Calculate the wavelength associated with an electron having a velocity of 106 m/s. (4)

(OR)

25. a. Deduce the one dimensional Schrodinger’s time – independent wave equation. (10)

b. Write a note on uncertainty principle. (5)