Reg No:…………
Name:…………………………………

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
FIRST SEMESTER B.TECH DEGREE EXAMINATION DEC 2015
PH 100 ENGINEERING PHYSICS

Duration: 3 Hrs.   Maximum Marks: 100

Part- A

Answer **all** questions . **Each** question carries **2 marks**

1. What is amplitude resonance? What is the condition of amplitude resonance?

2. Will a 4 meter long string stretched between two points support waves of $\lambda = 33$ cm. Justify your answer.

3. State Rayleigh's criterion for resolution of spectral lines in the case of grating.

4. What will happen to the diameter of the Newtons rings when the air film is replaced by water?

5. What is Meissner effect ?
6. What is quarter wave plate?

7. Write the expressions for the linear operators corresponding to the energy E and momentum p of a system.

8. Distinguish between Bosons and Fermions.

9. What do you mean by intensity and loudness of sound.

10. What is magnetostriction effect?

11. What is population inversion?
12. What are photo voltaic cells ?

(12 X2 = 24 Marks)

Part- B

Answer **any 12** questions . **Each** question carries **2 marks**

13. Obtain the One-dimensional differential wave equation and its solution.

14. Establish the equation of motion of a forced harmonic Oscillator.

15. An air wedge illuminated by light of wavelength of 6000A°. Find the angle of wedge?
    (There are 10 fringes in 1cm)

16. How many lines per meter there in a plane diffraction grating which gives in the second order of an angle of diffraction 30 degree for the light of wave length 520nm incident normally on it?

17. A quarter wave plate is to be made of quartz. The refractive indices of quartz for blue light of wavelength 434nm are n0=1.5539 and ne=1.5634.Calculate the required thickness.

18. Unpolarised light is falling on a Nicol prism. Polarised light emerging from it falls on another crossed Nicol.If the crossed Nicol is rotated through 30°, calculate the percentage of incident light transmitted.

19. Calculate the de Broglie wavelength of an electron whose kinetic energy is 10 KeV.

20. Electrons cannot be occupied inside the nucleus. Justify the statement with proof.

21. Write any 5 applications of ultrasonic waves.

22. Derive Sabine's formula for reverberation time and explain its importance.

23. Distinguish between spontaneous and stimulated emission

24. Draw and explain the V-I characteristics of a phototransistor.

(10 X4 = 40 Marks)

Part- C

Group -1: Answer **any 3** questions . **Each** question carries **6 marks**

25. Derive the expression for fundamental frequency of transverse vibrations in a stretched string.

26. Explain the action of a plane transmission grating. Derive the grating equation.

27. Discribe the construction and working of Nicol prism

28. Obtain Schrodinger's time dependent equation

(3 X6 = 18 Marks)

Group -2 : Answer **any 3** questions. **Each** question carries **6 marks**

29. How is magnetostriction effect used to produce ultrasonic waves?

30. Explain the factors affecting acoustics of a building. How can we rectify these factors while constructing a building?

31. Explain with necessary theory the working details of any four-level laser.

32. What is the principle of fiber optic cable?Derive an expression for numerical aperture.

(3 X6 = 18 Marks)