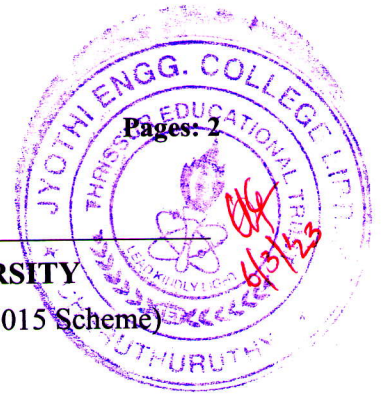


Reg No.: \_\_\_\_\_

Name: \_\_\_\_\_

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**

B.Tech Degree S1 (S,FE) S2 (S) Examination February 2023 (2015 Scheme)

**Course Code: PH 100****Course Name: ENGINEERING PHYSICS**

Max. Marks: 100

Duration: 3 Hours

**PART A***Answer all Questions. Each question carries 2 Marks*

		Marks
1	Write any two practical applications of damping.	(2)
2	Define frequency and wavelength of wave motion.	(2)
3	Write a note on interference filter.	(2)
4	Compare the phenomena of interference and diffraction.	(2)
5	Distinguish between positive and negative crystals with respect to polarisation.	(2)
6	Write a note on BCS theory.	(2)
7	Obtain the expressions for energy and momentum operator.	(2)
8	Derive the expression for volume of a unit cell in phase space.	(2)
9	Distinguish between musical sound and noise.	(2)
10	What is SONAR? Give one application.	(2)
11	What is pumping in Laser system? Mention two methods of pumping.	(2)
12	Write a short note on working of LED	(2)

**PART B***Answer any 10 questions. Each question carries 4 Marks*

13	With necessary graph, explain the concept of sharpness of resonance.	(4)
14	A wave is represented by the equation $y = 2.2 \cos(300t - 0.24x)$ , where $x$ and $y$ are in m and $t$ is in sec. Find its amplitude, frequency, wave length and wave velocity.	(4)
15	A parallel beam of light of wavelength $5890 \text{ \AA}$ , is incident on a glass plate of refractive index 1.5 such that the angle of refraction into the plate is $60^\circ$ . Calculate the smallest thickness of the plate which will make it appear dark by reflection.	(4)
16	A parallel beam of monochromatic light is allowed to be incident on a plane transmission grating having 5000 lines/cm and second order spectral line is found to be diffracted through $30^\circ$ . Calculate the wavelength of light used.	(4)

- 17 List any 4 uses of polaroids. (4)
- 18 What is Meissner effect? Show that super conductors behave like perfect diamagnets. (4)
- 19 State Heisenberg's Uncertainty Principle and hence explain the natural line broadening of spectral lines. (4)
- 20 Write any four postulates of Fermi- Dirac statistics (4)
- 21 The volume of a hall is  $1500 \text{ m}^3$ . It has a total absorption of  $160 \text{ m}^2$  sabine. If the hall is filled with audience who add another  $40 \text{ m}^2$  sabine, then find the difference in reverberation time. (4)
- 22 A quartz crystal of thickness  $0.001 \text{ m}$  is vibrating at resonance. Calculate the fundamental frequency. (Young's modulus for quartz =  $7.9 \times 10^{10} \text{ Nm}^{-2}$  and  $\rho$ , density of quartz =  $2.650 \times 10^3 \text{ kg/m}^3$ ) (4)
- 23 What is holography? Explain recording of hologram. (4)
- 24 Calculate the refractive index of cladding material of an optical fibre whose numerical aperture is 0.22 and refractive index of core is 1.42. (4)

**PART C**

*Answer any three questions. Each question carries 6 Marks*

- 25 Derive the differential equation for forced harmonic oscillator and obtain the solution. (6)
- 26 Explain the theory of grating and derive grating equation (6)
- 27 Describe the production of elliptically polarised light. How will you detect the state of polarisation of a given beam of light? (6)
- 28 Obtain the expression for energy eigen value and wave function of a particle trapped in one dimensional potential well. (6)

**PART D**

*Answer any three questions. Each question carries 6 Marks*

- 29 Describe any six acoustic factors of a hall and its remedies. (6)
- 30 With the help of a neat diagram explain the construction and working of magnetostriction oscillator. (6)
- 31 Explain the construction and working of Helium Neon laser. (6)
- 32 With the help of block diagram explain the working of optical fibre communication system. Mention two advantages of optical fibre communication system. (6)

\*\*\*