Sanjay Ghodawat University, Kolhapur

2017-18

Established as State Private University under Govt. of Maharashtra. Act No XL, 2017

FY B Tech | **School of Technology** | **Semester I**

FYT 102 | **Applied Physics** | **Max Marks: 100**

29 **Nov 2017** | **End Semester Examination (ESE)** | **Time: 3 Hrs**

Instructions for Students: 1) All questions are compulsory
2) Use of non-programmable calculator is allowed

			Marks	COs
Q1		Solve any Two		
	a)	What is piezoelectric effect? Explain the working of piezoelectric oscillator with circuit diagram.	08	CO1
	b)	Explain the following terms (i) Reverberation (ii) Reverberation time (iii) Absorption coefficient (iv) Sabine's formula	08	CO1
	c)	(i) Explain the various factors affecting architectural acoustics and their remedies.	05	CO1
		(ii) Mention any three applications of ultrasonic waves.	03	
Q2		Answer the following questions		
	a)	(i)Explain the construction and working of Laurent's Half shade polarimeter with suitable diagrams.	08	CO2
		(ii) Write a note on applications of electromagnetic waves.	05	
	b)	A plane grating has 15000 lines per inch. Find the angle of seperation of the 5048 Å and 5016 Å lines of helium in second order.	04	CO2
		OR		
	b)	Distinguish between positive and negative crystal.	04	CO2
Q3		Answer the following questions		
	a)	Explain with neat diagram the structure and types of an optical fiber.	06	CO3
	b)	Explain terms with proper diagrams: (i) Stimulated absorption (ii) Stimulated emission (iii) Population inversion	06	CO3
	c)	Explain the characteristics of laser.	05	CO3
		OR		
	c)	Define numerical aperture and acceptance angle. The numerical aperture of optical fibre is 0.50 and fractional refractive index change is 0.05. Find refractive index of core and cladding.	05	CO3

			Marks	COs
Q4		Solve any Two		
	a)	(i) Discuss de Broglie's concept of matter waves. Derive an expression for wavelength of matter waves and express it in terms of kinetic energy E of the material particle.	08	CO4
	b)	i) What is Compton effect? Explain the Compton effect on the basis of quantum theory of radiation.	04	CO4
		(ii) State and explain Heisenberg's uncertainty principle.	04	
	c)	(i) Explain photoelectric effect.	04	CO4
		(ii) A beam of gamma radiations having energy 510 KeV is incident on a foil of aluminium. Calculate: (i) Wavelength of radiation scattered at 90° (ii) Energy of the recoiled electron.	04	
Q5		Answer the following questions		
	a)	Explain the classification of magnetic materials with suitable examples.	07	CO5
	b)	Write a note on Hysteresis in ferromagnetic materials.	06	CO5
	c)	Define the terms- Magnetic moment, Magnetic susceptibility, Relative permeability and Magnetic Susceptibility.	04	CO5
		OR		
	c)	Distinguish between Soft and Hard magnetic materials	04	CO5
Q6		Answer the following questions		
	a)	Define packing density and determine atomic packing factor for SC, BCC and FCC lattice.	07	CO6
	b)	Explain construction and working of Bragg's X-ray spectrometer.	06	CO6
	c)	Define space lattice. Copper has FCC structure and atomic radius is 1.278 Å. Calculate its density. Given Molecular weight of Copper is 63.54.	04	CO6
		OR		
	c)	Draw Miller planes: (i) (110) (ii) (111) (iii) (210) (iv) (440).	04	CO6