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**

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

26 Dec

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 magnetostriction effect? Explain the working of magnetostriction oscillator with circuit diagram.	08	CO1
	b)	Explain with neat diagram the determiation of velocity and wavelength of ultrasonic waves.	08	CO1
	c)	(i) What are different factors affecting the acoustically good hall. Mention their remedies.	05	CO1
		(ii) State properties of ultrasonic waves.	03	
Q2		Answer the following questions		
	a)	What is double refraction? Distinguish between o-ray and e-ray. Explain Huygen's theory for double refraction.	08	CO2
	b)	Write a note on applications of electromagnetic waves.	05	CO2
		OR		
	b)	Explain terms: Polarization, positive crystal, negative crystal, specific rotation.	05	CO2
	c)	Define the term grating element and calculate the wavelength of spectral line when a parallel beam of sodium light is allowed to incident normally on a plane grating having 4250 lines per cm and spectral line is observed to be deviated through 30°.	04	CO2
Q3	a)	Explain structure and principle of an optical fiber using proper diagrams.	06	CO3
	b)	Explain terms: metastable state, pumping and stimulated emission using proper diagrams for each	06	CO3
	c)	Write different applications of laser.	05	CO3
		OR		
	c)	What are various advantages of an optical fiber?	05	CO3

			Marks	COs
Q4		Solve any Two		
	a)	(i) What is de-Broglie hypothesis? Derive an expression for wavelength of matter waves and express it in terms of kinetic energy E of the material particle	08	CO4
	b)	State and explain Heisenberg's uncertainty principle.	04	CO4
		OR		
	b)	What is Compon effect? Explain in brief using diagram.	04	CO4
	c)	(i) Compute the de-Broglie wavelength of 10 KeV neutrons. Mass of neutron may be taken as 1.675×10^{-27} Kg.	02	CO4
		(ii) X-ray photon of wavelength 0.3 Å is scattered through as angle 45° by a loosely bound electron. Find the wavelength of scattered photon.	02	
Q5		Answer the following questions		
	a)	Write differences for diamagnetic, paramagnetic and ferromagnetic materials.	06	CO5
	b)	Write a note on Hysteresis in ferromagnetic materials	06	CO5
	c)	What are the applications of magnetic materials?	05	CO5
		OR		
	c)	Distinguish between Soft and Hard magnetic materials	05	CO5
Q6		Answer the following questions		
	a)	Define atomic radius. Obtain atomic radius for SC, BCC and FCC.	06	CO6
	b)	What is axis of symmetry? Write axis of symmetry with proper diagrams for cubic crystal system.	06	CO6
	c)	State and prove Bragg's law.	05	CO6
		OR		
	c)	(i) X-rays of wavelength 0.36 Å is scattered by a Bragg's crystal spectrograph at angle of 4.8°. Find the interplanar seperation of atomic planes in the crystal. Given: n=1	03	CO6
		(ii) Draw Miller planes (101) and (220)	02	

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