Sanjay Ghodawat University, Kolhapur   2018-19

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

FY B Tech	School of Technology	Semester II
FYT 102 Friday	Applied Physics	Max Marks: 100
24th, May 2019	End Semester Examination (ESE)	Time: 3 Hrs

10.30 am to 1.30 pm

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

			Marks	COs
Q1		**Solve any Two**	Marks	COs
	a)	Explain with neat diagram the determination of velocity and wavelength of ultrasonic waves.	08	CO1
	b)	What is piezoelectric effect? Explain the working of piezoelectric oscillator with circuit diagram.	08	CO1
	c)	(i) Discuss various factors those affect architectural acoustics. Mention remedies for those factors.	05	CO1
		(ii) Write applications of ultrasonic waves.	03	
Q2		**Answer the following questions**		
	a)	What is diffraction grating? Explain its theory for deriving the grating equation.	08	CO2
	b)	What are different applications of electromagnetic waves?	05	
	c)	Light of wavelength 5000Å is incident normally on the plane transmission grating of width 3 cm and 15000 lines. Find the angle of diffraction in the 1st order.	04	CO2
		OR		
	c)	Distinguish between O-ray and e-ray.	04	CO2
Q3		**Answer the following questions**		
	a)	Explain in detail the lasing action with the help of suitable example.	07	CO3
	b)	Explain different types of optical fiber.	06	CO3
	c)	How optical fiber is advantageous over traditional wires.	04	CO3
		OR		
	c)	State various applications of laser.	04	CO3
Q4		**Solve any Two**	Marks	COs
	a)	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

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b)	i) What is Compton effect? Explain different cases of the Compton shift according to different incident angles.	04	CO4
	(ii) State and explain Heisenberg's uncertainty principle.	04	
c)	(i) What is photoelectric effect? How the increasing or decreasing intensity of incident photons affect the energy of ejected electrons?	04	CO4
	(ii) A beam of γ radiations having energy 510 keV is incident on a foil of aluminum. Calculate: a) wavelength of radiation scattered at 90°. b) Energy of the scattered photons.	04	

Q5   **Answer the following questions**

a)	Explain the classification of magnetic materials with suitable examples.	07	CO5
b)	Elaborate the variation of magnetic induction (B) of a ferromagnetic material with the intensity of applied magnetic field (H).	06	CO5
c)	Define the terms- Magnetic moment, Magnetic susceptibility, Relative permeability and Magnetic Susceptibility.	04	CO5

<div align="center">OR</div>

c)	Distinguish between Soft and Hard magnetic materials	04	CO5

Q6   **Answer the following questions**

a)	Define Atomic radius and determine atomic radius for SC, BCC and FCC lattice.	07	CO6
b)	State and prove Bragg's law using proper diagram of crystal lattice.	06	CO6
c)	(i) X-rays of wavelength 0.36Å are diffracted by a Bragg's crystal spectrograph at angle of 4.8°. Find the interplanar separation of atomic planes in the crystal. Given: n=1	02	CO6
	(ii) Explain center of symmetry.	02	

<div align="center">OR</div>

c)	Draw Miller planes: (i) (100) (ii) (101) (iii) (210) (iv) (220).	04	CO6

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