000627

PRN: Course Code: **USS401**

Second Year **B.Sc.** End Semester Examination Winter2024

Physics - IV

Day and Date: Fri 22 NOV 2024 Max Marks: **100**

Time: 02:00PM To 05:00PM Duration: **03**hrs

Instructions:

- All questions are ***compulsory***
- *Draw **neat labeled** diagram where necessary*
- Figures to the ***right*** shows ***full marks***
- ***Digital gadgets*** are ***not allowed***

Q.1 **Attempt the following**		**Marks**	**Bloom's Level**	**CO**
a)	Draw and explain graphically, the composition of two SHM's acting at right angles to each other and having frequencies in the ratio 2:1 and are in-phase.	08	L1	CO1
b)	What are beats? Show that the frequency of maxima and minima is same for beats.	08	L2	CO1
c)	What is superposition of waves? Explain the formation of Beats. Also interpret the Beats frequency.	09	L3	CO1
	OR			
d)	Discuss in details, analytically, the resultant motion of two collinear simple harmonic motions (SHM) having different frequencies.	09	L2	CO1

Q.2 **Attempt the following**				
a)	State working principle of Piezoelectric oscillator. Explain its construction and working to produce ultrasonic sound.	08	L3	CO2
b)	Explain the factors affecting the acoustics of a building. Give their remedies.	08	L2	CO2
c)	Discuss in details the acoustics aspects of acoustically good hall.	09	L1	CO2
	OR			

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d)	What is reverberation and reverberation time? The volume of a hall is 12,000 cu. ft. and its total absorption equals 1000 sq. ft. Entry of people in the hall raises the absorption by 2000 sq. ft. Determine change in the reverberation time.	09	L2	CO2

Q.3 **Attempt the following**

a)	Discuss the theory of plane diffraction grating.	08	L1	CO3
b)	Define polarization. Discuss any two methods to produce polarized light	08	L2	CO4
c)	What is diffraction grating. If a monochromatic light of wavelength 4800 Å strikes a grating and produces third order diffraction at 16 degrees angle. Determine the grating element and number of slits per cm.	09	L3	CO3
	OR			
d)	Define wavefront. Explain different types of wavefronts with diagrams..	09	L3	CO3

Q.4 **Attempt the following**

a)	Interpret the following terms: i) interference ii) constructive interference iii) destructive interference iv) polarization of light	08	L3	CO4
b)	Biprism is placed 10 cm away from the slit and the wavelength of monochromatic light used is 5500 A^0. The fringe width found on the screen at 90 cm away from the biprism is 8.526 x 10^{-2} cm. calculate the distance between two coherent sources.	08	L3	CO3
c)	Draw neat labeled diagram of Fresnel's biprism experiment for division of amplitude. Discuss the theory.	09	L4	CO4
	OR			
d)	Explain with neat labeled diagram Newton's ring experiment to measure wavelength of a light.	09	L4	CO4

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