

BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID SEMESTER EXAMINATION SP2023)

CLASS: ISc
BRANCH: PHYSICS

SEMESTER : II
SESSION : SP2023

SUBJECT: PH106 WAVES AND OPTICS

TIME: 02 Hours

FULL MARKS: 25

INSTRUCTIONS:

1. The question paper contains 5 questions each of 5 marks and total 25 marks.
 2. Attempt all questions.
 3. The missing data, if any, may be assumed suitably.
 4. Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates
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		CO	BL
Q.1(a)	Illustrate the difference between a periodic motion and a simple harmonic motion.	[2] 1	II
Q.1(b)	Two particles execute simple harmonic motion of the same amplitude and frequency along the same line. They pass one another when going in opposite directions; each time their displacement is half of their amplitude. Calculate their phase difference.	[3] 1	
Q.2	Explain the theory of the superposition of two collinear oscillations having same amplitude but different frequencies.	[5] 1	V
Q.3	Explain the velocity of transverse vibrations of stretched strings with suitable diagram.	[5] 2	V
Q.4(a)	Discuss the theory of open organ pipe with a suitable diagram.	[2] 2	VI
Q.4(b)	An open organ pipe has a fundamental frequency of 400 Hz. The second harmonic of the open pipe has the same frequency as the third harmonic of a closed organ pipe. How long is each pipe? Consider the speed of sound as 340 m/s.	[3] 2	
Q.5(a)	Demonstrate the statement of Huygens Principle.	[2] 2	II
Q.5(b)	Write a short note on water waves.	[3] 2	

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