

**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)**

**CLASS: IMSc
BRANCH: PHYSICS**

**SEMESTER : III
SESSION : MO/2024**

SUBJECT: PH106R1 WAVES & OPTICS

TIME: 3 Hours

FULL MARKS: 50

INSTRUCTIONS:

1. The question paper contains 5 questions each of 10 marks and total 50 marks.
 2. Attempt all questions.
 3. The missing data, if any, may be assumed suitably.
 4. Before attempting the question paper, be sure that you have got the correct question paper.
 5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.
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		CO	BL
Q.1(a)	Develop an expression for resultant motion of two mutually perpendicular harmonic oscillations having different angular frequency.	[5] 1	III
Q.1(b)	Find an expression for energy density and intensity of plane progressive wave.	[5] 1	I
Q.2(a)	Develop Newton's formula for velocity of sound. What was Laplace correction?	[5] 2	VI
Q.2(b)	Find an expression for total energy in a vibrating string.	[5] 2	I
Q.3(a)	Explain the formation of interference patterns in Fresnel's biprism experiment with proper diagram.	[5] 3	II
Q.3(b)	How interference fringes are formed in Michelson interferometer? Explain with proper diagram.	[5] 3	I
Q.4(a)	Develop an expression for intensity due to single slit Fraunhofer diffraction.	[5] 4	III
Q.4(b)	What is a zone plate. Explain the theory of zone plate.	[5] 4	I
Q.5(a)	Explain polarization of light. Mention different ways to achieve polarized light from unpolarized light.	[5] 5	II
Q.5(b)	Discuss briefly the working principle of nicol prism with proper diagram.	[5] 5	VI

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