

Question Paper

Exam Date & Time: 11-Jan-2023 (02:30 PM - 04:30 PM)



MANIPAL ACADEMY OF HIGHER EDUCATION

FIRST SEMESTER BACHELOR OF OPTOMETRY DEGREE EXAMINATION - JANUARY 2023
SUBJECT: BOPT 101- PHYSICAL OPTICS
(2016RV SCHEME)

Marks: 50

Duration: 120 mins.

Answer all the questions.

- 1A) Explain the principle and working of a Laurent's half shade polarimeter. (5)
- 1B) Obtain an expression for intensity of light in single-slit diffraction pattern using phasor diagram. (5)
- 2A) Obtain an expression for the diameter of m^{th} order dark ring in the case of Newton's rings. (5)
- 2B) Obtain an expression for the fringe width in case of Young's double slit interference. (5)
- 3A) Explain the phenomenon of spontaneous and stimulated emission. (5)
- 3B) Explain division of amplitude and division of wavefront method for producing coherent waves using the proper examples. (5)
- 3C) An atom has two energy levels with a transition wavelength of 582 nm. At 300 K, 4×10^{20} atoms are there in the lower state. (5)
(i) How many occupy the upper state under conditions of thermal equilibrium?
(ii) Suppose, instead, that 7.0×10^{20} atoms are pumped into upper state, with 4.0×10^{20} in the lower state. How much energy could be released in a single laser pulse?
- 3D) Explain briefly how Lummer-Brodhum photometer may be used to compare the luminous intensities of two sources. (5)
- 4A) Mention ANY FOUR applications of laser. (2)
- 4B) What is interference filter? (2)
- 4C) Monochromatic green light, wavelength = 554 nm, illuminates two parallel narrow slits 7.7 micron apart. Calculate the angular deviation of the third-order, $m = 3$, bright fringe (i) in radians and (ii) in degrees. (2)
- 4D) State the Rayleigh's criterion for optical resolution. (2)
- 4E) The sodium doublet in the spectrum of sodium is a pair of lines with wavelengths 589.0 and 589.6 nm. Calculate the resolving power of the grating. (2)

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Question Paper

Exam Date & Time: 13-Jan-2023 (02:30 PM - 04:30 PM)



MANIPAL ACADEMY OF HIGHER EDUCATION

THIRD SEMESTER BACHELOR OF OPTOMETRY DEGREE EXAMINATION - JANUARY 2023
SUBJECT: BOPT 205 - VISUAL OPTICS - I
(2016 SCHEME)

Marks: 50

Duration: 120 mins.

Answer all the questions.

- 1) Describe in detail aetiology, optical condition, types, clinical features and management of Myopia. (10)
- 2) Explain the psychophysical aspects of Visual acuity chart construction. (10)
- 3A) Write in detail about the optics of crystalline lens. (5)
- 3B) Describe reduced eye model. (5)
- 3C) Explain in detail the axis and angles of the eye. (5)
- 3D) Mention the stepwise test procedure for measuring visual acuity using Snellen chart. (5)
- 4A) What are purkinge images? (2)
- 4B) List down the components of trial set. (2)
- 4C) What is Strum's Conoid? (2)
- 4D) Mention the clinical features of Aphakia. (2)
- 4E) What is the difference between spatial and temporal resolution? (2)

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