Central Administration for Curriculum Development

Science development office

MINISTRY OF EDUCATION AND TECHNICAL EDUCATION

وزارة التربية والتعليم والتعليم الفني

Physics

Second Secondary Grade

2026

Home Work

Week 7

Name: .....

Class: .....

School: .....

إعـداد

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مراجعة

عمر جودة و محمد عنتر

مكتب مستشار العلوم

عبدالله مصطفى - سعيد محمد

إشراف

د/ عزيزة رجب خليفة

مستشار العلـــوم

إشراف عام

د/ هالـــة عبـــد السلام

رئيس الإدارة المركزية للتعليم العام

(1) The wavelength λ of any monochromatic light in Thomas Young's double-slit experiment is determined from the relation:

a) $\lambda = \frac{\Delta y\, R}{d}$ b) $R = \frac{\Delta y\, d}{\lambda}$

c) $\Delta y = \frac{\lambda d}{R}$ d) $d = \frac{\lambda\, \Delta y}{R}$

(2) In the phenomenon of light interference in Young's experiment, bright fringes are formed between dark fringes.

The central bright fringe is formed as a result of the interference between …….

a) The second crest of the first source with the second crest of the second source.

b) The first trough of the first source with the first crest of the second source.

c) The second crest of the first source with the third crest of the second source.

d) The first crest of the first source with the third crest of the second source.

(3) If the distance of the first bright fringe from the central fringe in Young's experiment is 2 cm, then the distance of the third dark fringe from the central fringe is ……..

a) 2 cm

b) 5 cm

c) 6 cm

d) 7 cm

(4) In Young's experiment, monochromatic light of wavelength 5000 Å is used.

The distance between the two slits is 0.3 mm, and the distance between two successive bright fringes is 5 mm.

The distance between the double slit and the screen where the interference pattern appears is ……..

a) 9 m b) 12 m

c) 3 m d) 6 m

(5) In Young's experiment, when the distance between the double slit and the screen is doubled, the distance between two successive fringes of the same type …….

a) Doubles and the clarity of the fringes decreases.

b) Doubles and the clarity of the fringes increases.

c) Becomes half and the clarity of the fringes increases.

d) Becomes half and the clarity of the fringes decreases.

(6) In Young's experiment, a monochromatic light ray is used and the distance between the slits is d_1 , then the double slit is replaced with another double slit whose separation is half the original distance.

so, the distance between two successive fringes of the same type in the second case is …

a) $\Delta y_2 = \frac{\Delta y_1}{2}$

b) $\Delta y_2 = \Delta y_1$

c) $\Delta y_2 = 4\Delta y_1$

d) $\Delta y_2 = 2\Delta y_1$

(7) In Young's experiment, if the distance of the fourth dark fringe from the central fringe is X, then the distance between the central fringe and the first bright fringe equals …….

a) $\frac{X}{4.5}$

b) $\frac{X}{4}$

c) $\frac{X}{3.5}$

d) $\frac{X}{3}$

(8) The ratio between the distance from the central fringe to the first bright fringe when using red light and when using violet light in Young's experiment is:

a) Greater than one

b) Less than one

c) Equal to one

d) Equal to zero

(9) The area of the Airy disk in a light diffraction experiment increases when ……

a) The screen is moved closer to the circular aperture.

b) Monochromatic light with a higher frequency is used.

c) The diameter of the circular aperture increases.

d) The diameter of the circular aperture decreases.

(10) Which of the following properties of the ray changes when diffraction occurs?

a) Speed

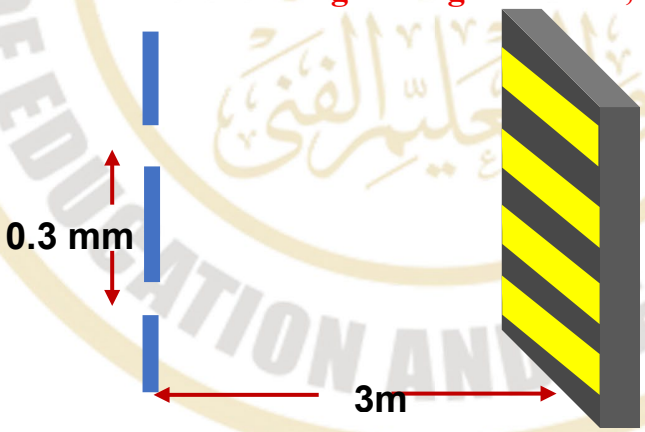
b) Wavelength

c) Frequency

d) Direction

Second: Essay

(1) From the diagram shown in front of you of Young's double-slit experiment, if the distance between two successive bright fringes is 5 mm, calculate the wavelength of the light used.



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(3) In Young's double-slit experiment, the distance between the slits is A, the distance between the slits and the observation screen is X, and a monochromatic light source of wavelength λ is used.

If the light source is replaced with another source of wavelength 2.4 λ ,

Calculate the new distance between the slits and the observation screen in terms of X in order to keep the interference pattern unchanged.

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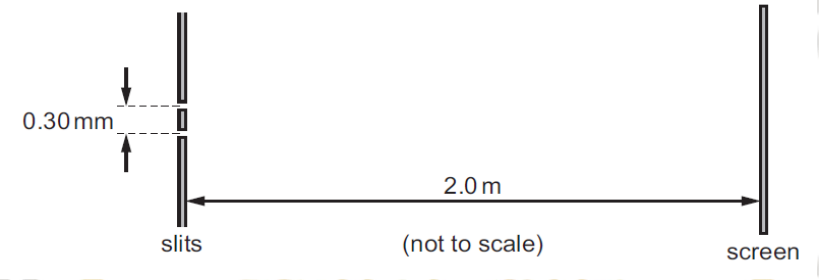
(4) Monochromatic light with a wavelength of 450 nm passes through two parallel slits separated by 0.3 mm. The bright fringes are observed on a screen 2 m away.

Calculate the distance (in millimeters) between two successive fringes of the same type.



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