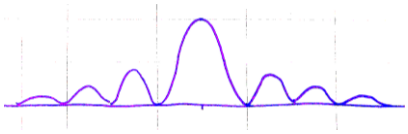
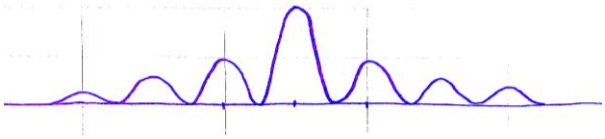
AP Physics TEST
Interference 2014

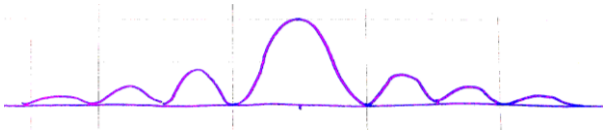
Name _____
2-3a 3b-4 5-6a 6b-7

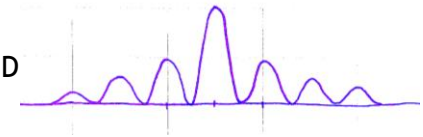
Multiple Choice: Choose the one best answer for each of the following questions.
Write on this test; it is your copy. ***NOTA means "None Of These Answers"***

1. Which of the following intensity graphs shows a double slit interference pattern with the smallest gap size?

A 

B 

C 

D 

2. In a Young's double-slit interference apparatus, by what factor is the distance between adjacent light and dark fringes changed when the separation between slits is doubled?
a. ¼ b. ½ c. 1 d. 2 e. 4

3. Upon reflection, light undergoes a 180° phase change:
a. always.
b. if the incident medium has the higher index of refraction.
c. if the incident medium has the lower index of refraction.
d. whenever the incident angle is less than the critical angle.

4. Light of wavelength 575 nm falls on a double-slit and the second order bright fringe is seen at an angle of 5.7°. What is the separation between the double slits? (sin 5.7 = 0.1)
a. 7.0 mm b. 10 mm c. 17 mm d. 20 mm e. NOTA

5. When a beam of light (wavelength = 590 nm), originally traveling in air, enters a piece of glass (index of refraction 1.50), its frequency
a. increases by a factor of 1.50.
b. is reduced to 2/3 its original value.
c. is unaffected.
d. none of the given answers

6. What principle is responsible for alternating light and dark bands when light passes through two or more narrow slits?
a. refraction b. polarization c. dispersion d. interference

7. At the first maxima on either side of the central bright spot in a double-slit experiment, light from each opening arrives
a. in phase. b. 90° out of phase. c. 180° out of phase. d. NOTA

8. The separation between adjacent maxima in a double-slit interference pattern using monochromatic light is
a. greatest for red light.
b. greatest for green light.
c. greatest for blue light.
d. the same for all colors of light.

9. A soap bubble has an index of refraction of 1.5. What minimum thickness of this bubble will ensure maximum reflectance of normally incident 600 nm wavelength light?
a. 100 nm b. 200 nm c. 300 nm d. 400 nm e. NOTA

interference
Answer Section

MULTIPLE CHOICE

1. ANS: B PTS: 1 DIF: 1
TOP: 24.2 Young's Double-Slit Experiment

2. ANS: B PTS: 1 DIF: 1
TOP: 24.2 Young's Double-Slit Experiment

3. ANS: C PTS: 1 DIF: 1
TOP: 24.3 Change of Phase Due to Reflection | 24.4 Interference in Thin Films

4. ANS: C PTS: 1 DIF: 2
TOP: 24.3 Change of Phase Due to Reflection | 24.4 Interference in Thin Films

5. ANS: C PTS: 1 DIF: 1 REF: Sec. 24.1-24.2

6. ANS: D PTS: 1 DIF: 1 REF: Sec. 24.3

7. ANS: A PTS: 1 DIF: 1 REF: Sec. 24.3

8. ANS: A PTS: 1 DIF: 1 REF: Sec. 24.3

9. ANS: B PTS: 1 DIF: 2 REF: Sec. 24.8