

## Unit 12 - Week 10

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### Assignment 10

The due date for submitting this assignment has passed. Due on 2020-04-08, 23:59 IST.  
As per our records you have not submitted this assignment.

- Pellin-Broca prism commonly used for

(a) Constant deviation of all wavelengths  
(b) Zero deviation of wavelengths  
(c) Dispersion of wavelengths with different deviations  
(d) None of these

(a)  
 (b)  
 (c)  
 (d)

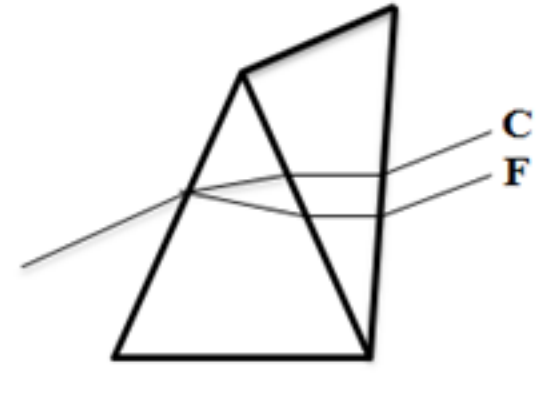
No, the answer is incorrect.  
Score: 0  
Accepted Answers: (a)
- Pellin-Broca prism consists of

(a) Two right angled prisms  
(b) Three right angled prisms  
(c) Four right angled prisms  
(d) None of these

(a)  
 (b)  
 (c)  
 (d)

No, the answer is incorrect.  
Score: 0  
Accepted Answers: (b)
- By joining prisms of two different glasses as shown in figure bellow, it is possible to deviates two wavelengths by same amount. We then say that the prism is achromatic for these two wavelengths. It is required to fit a  $10^\circ$  crown-glass prism with a flint-glass prism so as to achromatize the wavelength interval between the C and F spectra lines. What must be the angle of the flint-glass prism?

(Given: for crown-glass  $\mu_C = 1.514$  and  $\mu_F = 1.523$  ; for flint-glass  $\mu'_C = 1.644$  and  $\mu'_F = 1.664$ )



(a)  $4.5^\circ$   
(b)  $6.5^\circ$   
(c)  $8.5^\circ$   
(d)  $9.5^\circ$

(a)  
 (b)  
 (c)  
 (d)

No, the answer is incorrect.  
Score: 0  
Accepted Answers: (a)
- Consider a diatomic molecule to be a rigid rotator and transition occurs  $J=0$  to  $J=1$  at wave number  $\bar{\nu} = 20.68 \text{ cm}^{-1}$ . Find out the value of rotational constant.

(a)  $10.34 \text{ cm}^{-1}$   
(b)  $12.38 \text{ cm}^{-1}$   
(c)  $15.21 \text{ cm}^{-1}$   
(d)  $19.34 \text{ cm}^{-1}$

(a)  
 (b)  
 (c)  
 (d)

No, the answer is incorrect.  
Score: 0  
Accepted Answers: (a)
- Assume that the  $\text{I}_2$  molecule behaves like a harmonic oscillator with a force constant  $k = 573 \text{ N/m}$ . Find the vibrational quantum number corresponding to its  $4.61 \text{ eV}$  dissociation energy. Mass of the iodine atom is  $2.1 \times 10^{-25} \text{ kg}$  and  $h = 6.6 \times 10^{-34} \text{ J-s}$

(a) 25  
(b) 45  
(c) 75  
(d) 95

(a)  
 (b)  
 (c)  
 (d)

No, the answer is incorrect.  
Score: 0  
Accepted Answers: (d)
- The Zeeman pattern of a line consists of six equidistant components. The upper state term is known to be  $^2\text{P}_{3/2}$ . Determine the lower state term.

(a)  $^2\text{P}_{1/2}$   
(b)  $^2\text{S}_{1/2}$   
(c)  $^3\text{P}_2$   
(d)  $^3\text{D}_3$

(a)  
 (b)  
 (c)  
 (d)

No, the answer is incorrect.  
Score: 0  
Accepted Answers: (b)
- The Zeeman pattern of a line consists of nine equidistance components. The upper state is known to be  $^3\text{P}_2$  (L-S coupling). Determine the lowest state term.

(a)  $^3\text{S}_1$   
(b)  $^3\text{P}_{1/2}$   
(c)  $^3\text{D}_2$   
(d)  $^3\text{S}_{1/2}$

(a)  
 (b)  
 (c)  
 (d)

No, the answer is incorrect.  
Score: 0  
Accepted Answers: (a)
- A light is a mixture of two wavelengths  $600 \text{ nm}$  and  $620 \text{ nm}$  makes incident normally on a plane transmission grating having  $12000 \text{ lines/cm}$ . Calculate the angular separation (in degree) of the two lines in the first order spectrum.

(a) 0.75  
(b) 1.25  
(c) 2.02  
(d) 0.85

(a)  
 (b)  
 (c)  
 (d)

No, the answer is incorrect.  
Score: 0  
Accepted Answers: (c)
- Sodium light is a mixture of two wavelengths  $589 \text{ nm}$  and  $589.6 \text{ nm}$  makes incident normally on a plane transmission grating having  $15000 \text{ lines/cm}$ . Calculate the angular separation (in degree) of the two lines in the first order spectrum.

(a) 0.11  
(b) 1.2  
(c) 0.556  
(d) 2.05

(a)  
 (b)  
 (c)  
 (d)

No, the answer is incorrect.  
Score: 0  
Accepted Answers: (a)
- Sodium light is a mixture of two wavelengths  $589 \text{ nm}$  and  $589.6 \text{ nm}$  makes incident normally on a plane transmission grating having  $3000 \text{ lines/cm}$ . Calculate the angular separation (in degree) of the two lines in the fifth order spectrum.

(a) 0.16  
(b) 0.11  
(c) 0.56  
(d) 2.05

(a)  
 (b)  
 (c)  
 (d)

No, the answer is incorrect.  
Score: 0  
Accepted Answers: (b)