

“Dissemination of Education for Knowledge, Science and Culture”

- Shikshanmaharshi Dr. Bapuji Salunkhe

Shri Swami Vivekanand Shikshan Sanstha’s

Vivekanand College, Kolhapur

(Autonomous)

Department of Physics

ICT based CIE

on

B.Sc. II: Internal Examination of Waves and Optics Part II

Conducted by

Dr. M. M. Karanjkar

on

Day: Thursday, Date: 21/01/2021

(2020 – 21)

B.Sc. II SEM IV, Examination 2020

Physics Paper No. VII. [Waves and Optics Part II].

Day: Thursday

Date: 21/01/2021

Total Marks: 50

Solve any 25 of the following.

* Indicates required question

1. Email *

2. Name *

3. Seat No. *

4. PRN. No. *

5. 1. Cardinal points consists of *

2 points

Mark only one oval.

- One pair of points
- Two pair of points
- Three pair of points
- none of above

6. 2. In optical system, if the medium on the both sides are same (air) then principle points coincide with----- * 2 points

Mark only one oval.

- nodal points
 focal points
 principle point itself
 none of above

7. Principal planes are the cardinal planes of unit positive * 2 points

Mark only one oval.

- angular magnification
 lateral magnification
 longitudinal magnification
 none of above

8. If θ_1 and θ_2 are the angles made by the image point two the object point respectively with the axis then the angular magnification is

Mark only one oval.

- $\gamma = \theta_1/\theta_2$
 $\gamma = \theta_2/\theta_1$
 $\gamma = \theta_1.\theta_2$
 none of above

9. In case of interference maxima is produced, if the path difference between two waves is an integral multiple of wavelength ----- * 2 points

Mark only one oval.

- λ
- $d\lambda$
- $\lambda/2$
- none of above

10. In Micelson's interferometer, the circular fringes are obtained when two mirrors M1 and M2 are ----- * 2 points

Mark only one oval.

- parallel to each other
- incline to each other
- mutually perpendicular to each other
- none of above

11. In Fabri-Parot interferometer, the interference fringes are obtained by multiple ----- between the two plates. * 2 points

Mark only one oval.

- transmission
- reflection
- refraction
- none of above

12. The resolving power of Fabri-Parot interferometer is----- *

2 points

Mark only one oval.

- high
- low
- zero
- none of above

13. The band width of Fabri-Parot interferometer is----- *

2 points

Mark only one oval.

- smaller
- much smaller
- high
- none of above

14. The optical frequency is of the order of----- *

2 points

Mark only one oval.

- 10^6Hz
- 10^4Hz
- 10^{10}Hz
- 10^{15}Hz

15. The refractive index of cladding is-----the core. * 2 points

Mark only one oval.

- greater than
 lower than
 equal to
 greater or lower than

16. optical fibers are----- * 2 points

Mark only one oval.

- flexible
 rigid
 plastic
 elastic

17. For smaller pulse dispersion,the information carrying capacity of the system is----- * 2 points

Mark only one oval.

- smaller
 greater
 zero
 Few

18. The bending of light round the edges of an obstacle is called as * 2 points

Mark only one oval.

- diffraction
 interference
 polarisation
 none of these

19. In Fresnel's type of diffraction..... * 2 points

Mark only one oval.

- source of light and screen are at infinite distance
 source of light and screen are at finite distance
 only source of light is at finite distance
 only screen of light is at finite distance

20. Zone plate works similar to..... * 2 points

Mark only one oval.

- a) concave lens
 b) plan mirror
 c) convex lens
 d) plano convex

21. In straight edge, fringes are observed..... *

2 points

Mark only one oval.

- away from edge of the shadow
- In the region of shadow
- Near the edge of geometrical shadow in the region of light
- In the region of light

22. In Fresnel's half period zone, the corresponding points differ by a path difference of.....

* 2 points

Mark only one oval.

- $\lambda/2$
- $\lambda/4$
- λ
- None of these

23. Resolving power of a plane diffraction grating is..... *

2 points

Mark only one oval.

- directly proportional to order of the spectrum
- Inversely proportional to order of the spectrum
- dependent on the grating element
- independent of order of the spectrum

24. For convex lens, the half angular width of the principal or central maximum * 2 points in the direction of pattern is

Mark only one oval.

- $d\theta = 1.22 D/\lambda$
- $d\theta = 1.22 \lambda/D$
- $d\theta = 1.22 D\lambda$
- $d\theta = 1.22t/\lambda$

25. The resolving power of a prism or a grating is expressed by the relation * 2 points

Mark only one oval.

- $d\lambda/\lambda$
- $\lambda/d\lambda$
- $\lambda.d\lambda$
- $(\lambda+d\lambda)/\lambda$

26. Resolving power is greater for wavelength. * 2 points

Mark only one oval.

- longer
- shorter
- same
- all

27. In spontaneous emission of radiation, the emission occurs by * 2 points

Mark only one oval.

- external stimulus
- without external stimulus
- internal stimulus
- radiation

28. The coefficients A_{21}, B_{12}, B_{21} * 2 points

Mark only one oval.

- Huygen's coefficients
- Einstein's Coefficients
- Newton's coefficients
- Ali Javan's coefficients

29. Ruby laser is a..... * 2 points

Mark only one oval.

- semiconductor laser
- crystalline solid laser
- gas laser
- liquid dye laser

30. He – Ne laser is *

2 points

Mark only one oval.

- semiconductor laser
- crystalline solid laser
- gas laser
- liquid dye laser

31. A double refracting crystal is a positive crystal when.... *

2 points

Mark only one oval.

- $\mu_0 < \mu_e$
- $\mu_0 = \mu_e$
- $\mu_0 = \mu_e^2$
- $\mu_0 > \mu_e$
- Option 5

32. The O-ray and E-ray have same velocity inside the crystal along----- direction

* 2 points

Mark only one oval.

- plane of vibration
- optic axis
- plane of polarization
- refracting surface

33. For negative crystal in double refraction.... *

2 points

Mark only one oval.

- $v_0 > v_e$
- $v_0 = v_e$
- $v_0 < v_e$
- $v_0 > 2v_e$

34. The wave of surface for E-ray in double refracting crystal is.... *

2 points

Mark only one oval.

- ellipsoid of revolution
- sphere
- rhombohedron
- parabola

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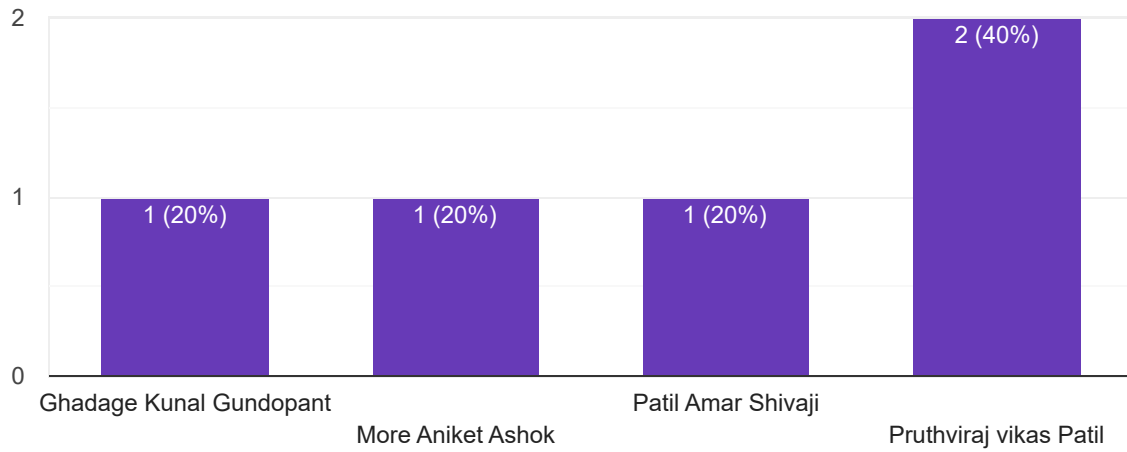
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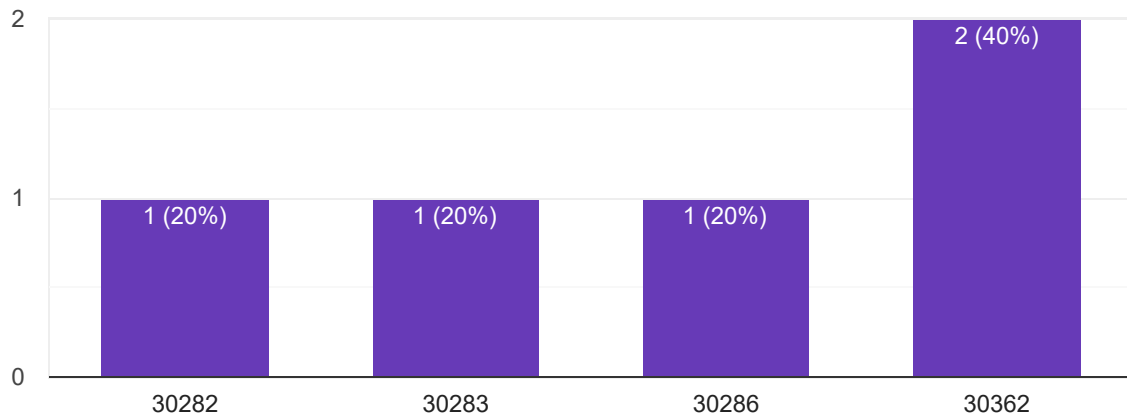
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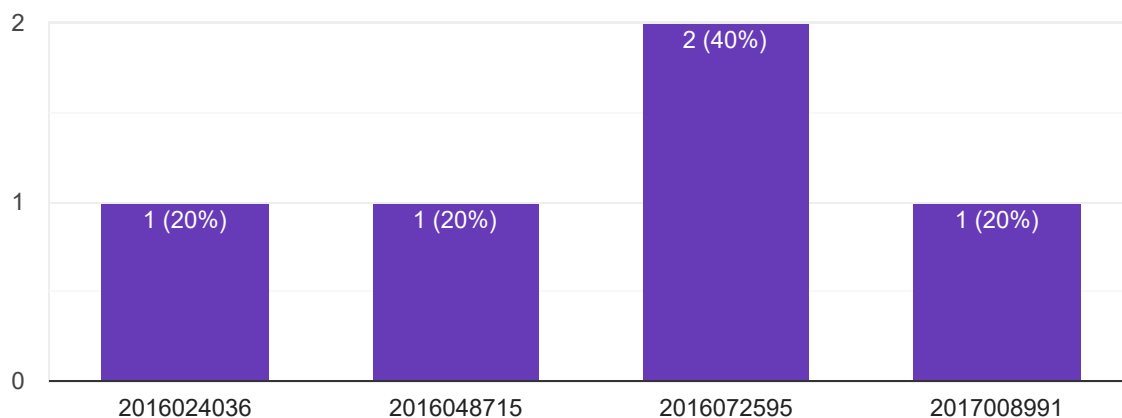
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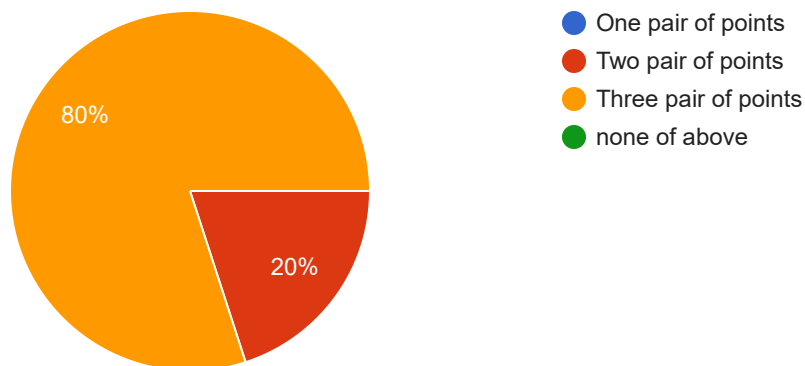
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1. Cardinal points consists of

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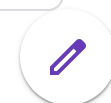
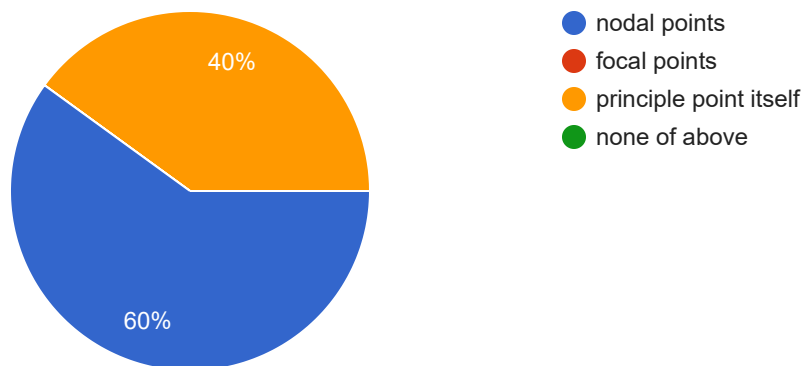
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2. In optical system, if the medium on the both sides are same (air) then principle points coincide with-----

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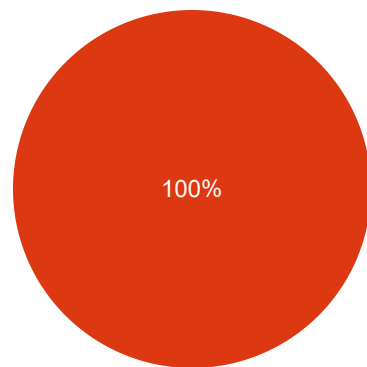
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Principal planes are the cardinal planes of unit positive

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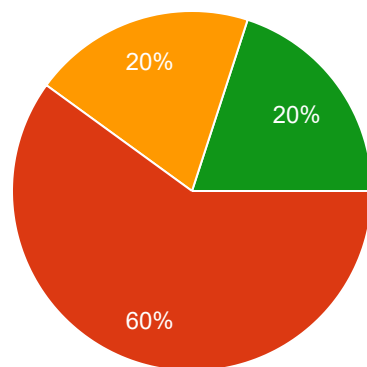


- angular magnification
- lateral magnification
- longitudinal magnification
- none of above

If θ_1 and θ_2 are the angles made by the image point two the object point respectively with the axis then the angular magnification is

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5 responses

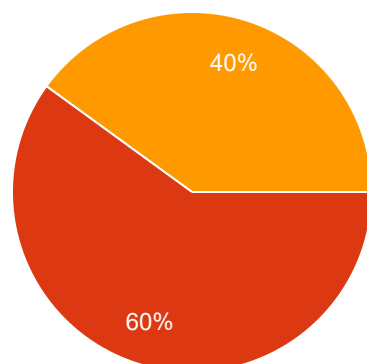


- $\gamma = \theta_1/\theta_2$
- $\gamma = \theta_2/\theta_1$
- $\gamma = \theta_1.\theta_2$
- none of above

In case of interference maxima is produced, if the path difference between two waves is an integral multiple of wavelength

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5 responses



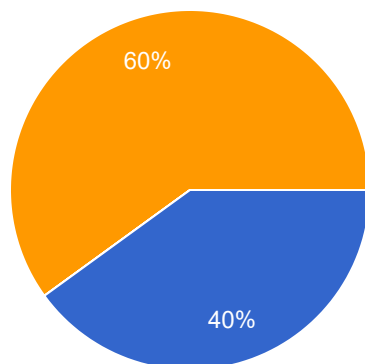
- λ
- $d\lambda$
- $\lambda/2$
- none of above



In Micelson's interferometer, the circular fringes are obtained when two mirrors M1 and M2 are -----

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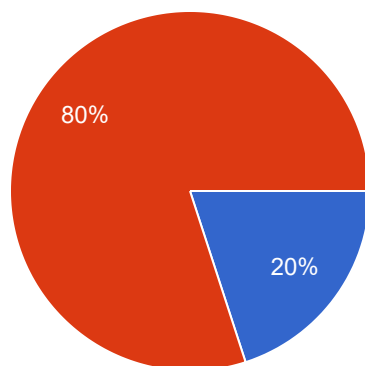


- parallel to each other
- incline to each other
- mutually perpendicular to each other
- none of above

In Fabri-Parot interferometer, the interference fringes are obtained by multiple ----- between the two plates.

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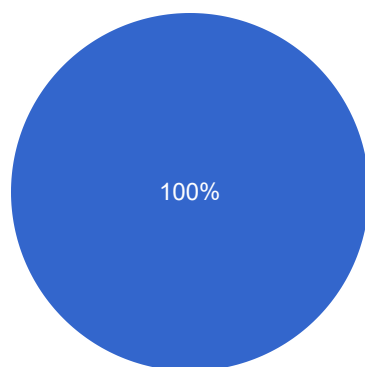


- transmission
- reflection
- refraction
- none of above

The resolving power of Fabri-Parot interferometer is-----

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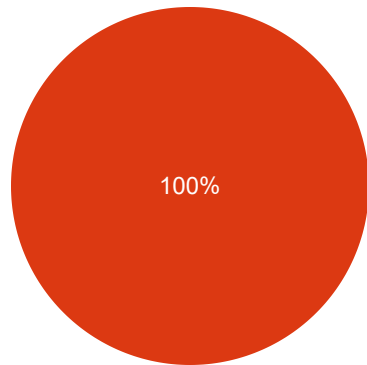
- high
- low
- zero
- none of above







The band width of Fabri-Parot interferometer is-----

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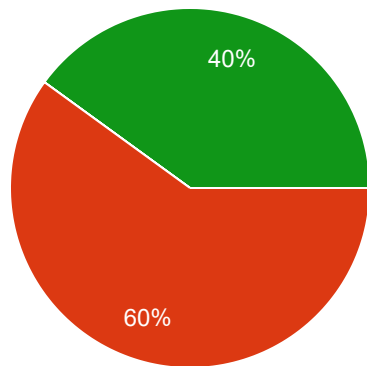


-  smaller
-  much smaller
-  high
-  none of above

The optical frequency is of the order of-----

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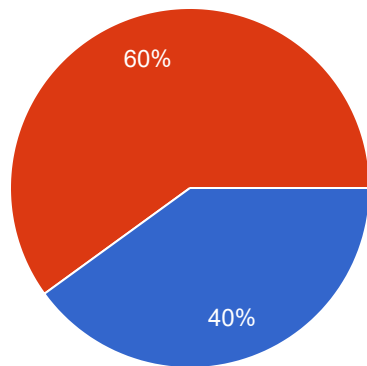






-  10^6Hz
-  10^4Hz
-  10^{10}Hz
-  10^{15}Hz

The refractive index of cladding is-----the core.

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5 responses



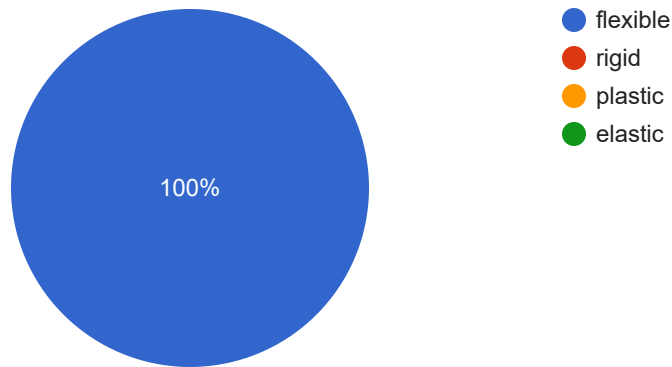
-  greater than
-  lower than
-  equal to
-  greater or lower than



optical fibers are-----

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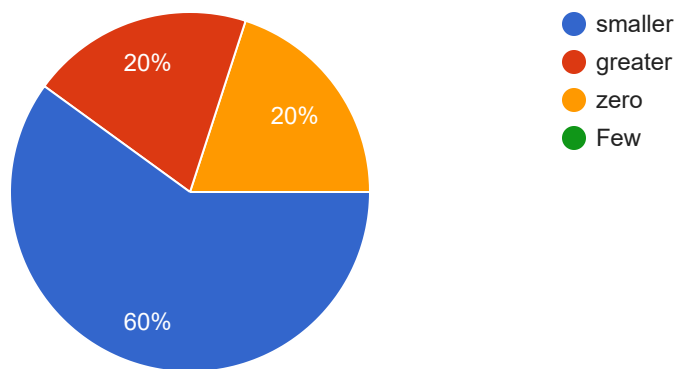
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For smaller pulse dispersion,the information carrying capacity of the system is-----

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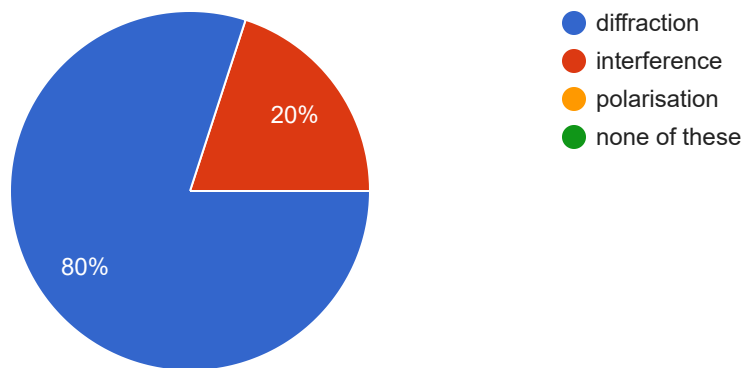
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The bending of light round the edges of an obstacle is called as

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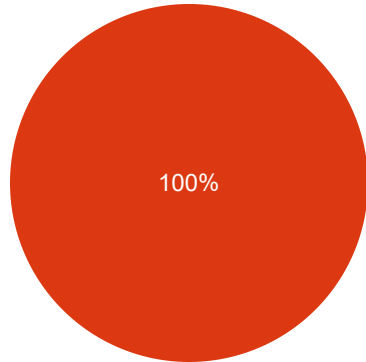
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In Fresnel's type of diffraction.....

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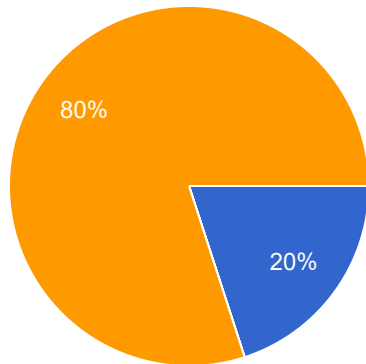


- source of light and screen are at infinite distance
- source of light and screen are at finite distance
- only source of light is at finite distance
- only screen of light is at finite distance

Zone plate works similar to.....

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5 responses

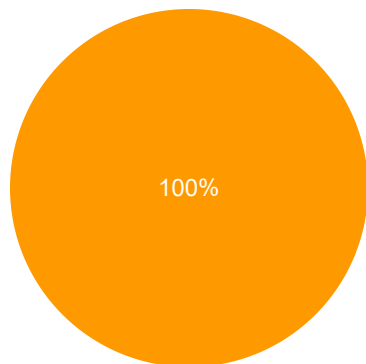


- a) concave lens
- b) plan mirror
- c) convex lens
- d) plano convex

In straight edge, fringes are observed.....

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5 responses



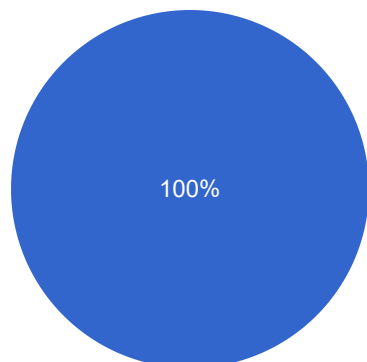
- away from edge of the shadow
- In the region of shadow
- Near the edge of geometrical shadow in the region of light
- In the region of light



In Fresnel's half period zone, the corresponding points differ by a path difference of.....

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5 responses

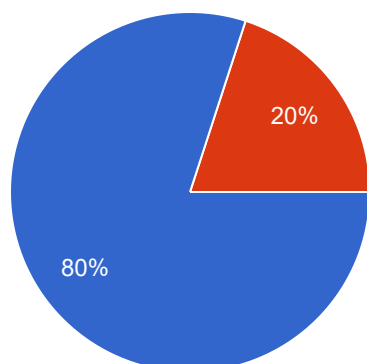


- $\lambda/2$
- $\lambda/4$
- λ
- None of these

Resolving power of a plane diffraction grating is.....

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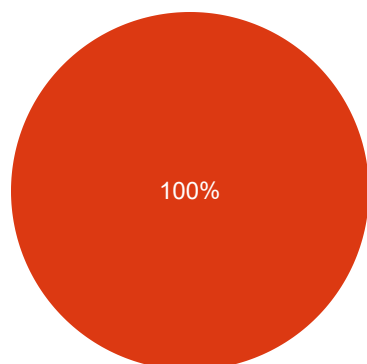


- directly proportional to order of the spectrum
- Inversely proportional to order of the spectrum
- dependent on the grating element
- independent of order of the spectrum

For convex lens, the half angular width of the principal or central maximum in the direction of pattern is

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5 responses



- $d\theta = 1.22 D/\lambda$
- $d\theta = 1.22 \lambda/D$
- $d\theta = 1.22 D\lambda$
- $d\theta = 1.22t/\lambda$

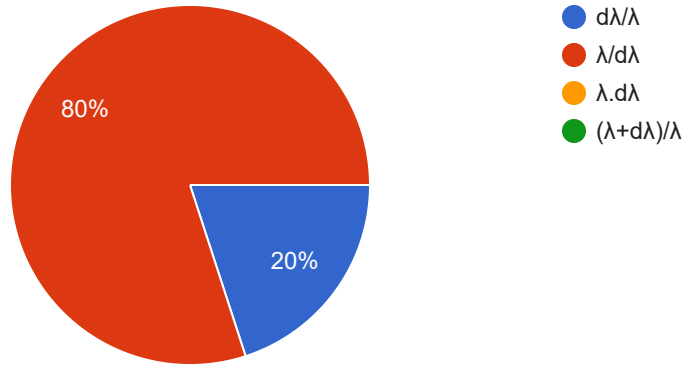


The resolving power of a prism or a grating is expressed by the relation

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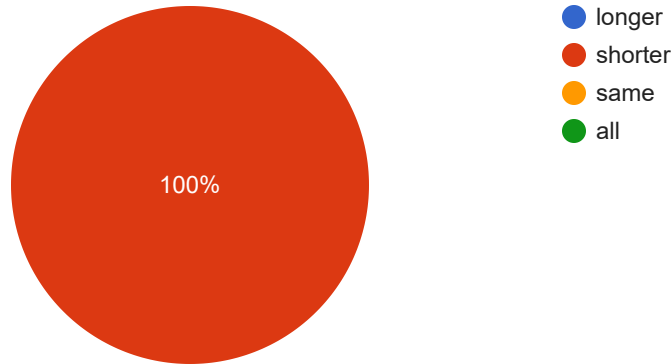
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Resolving power is greater for wavelength.

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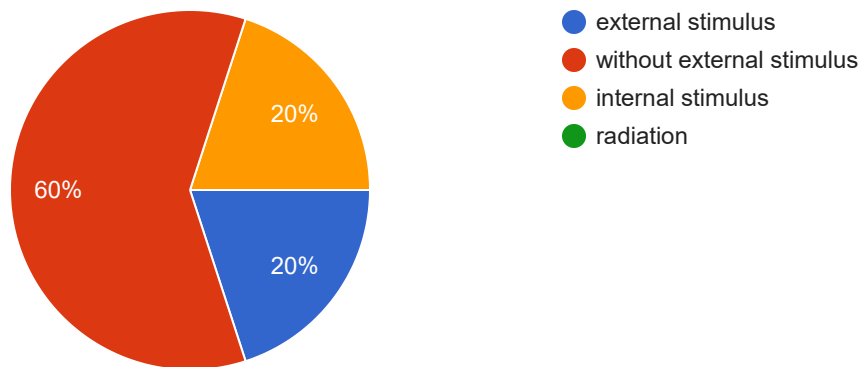
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In spontaneous emission of radiation, the emission occurs by

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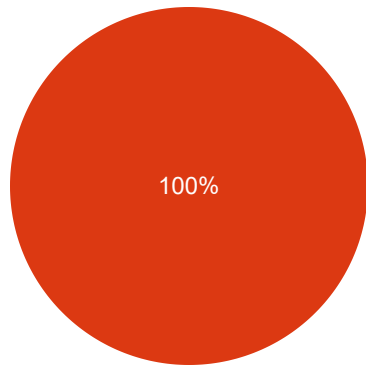
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The coefficients A₂₁, B₁₂, B₂₁

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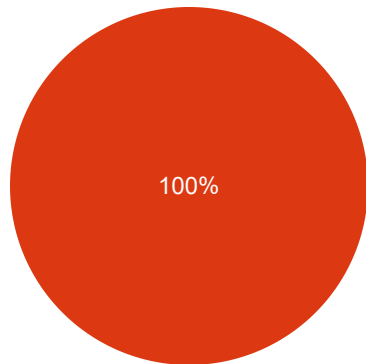






-  Huygen's coefficients
-  Einstein's Coefficients
-  Newton's coefficients
-  Ali Javan's coefficients

Ruby laser is a.....

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5 responses

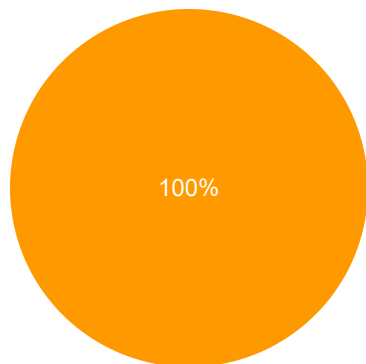






-  semiconductor laser
-  crystalline solid laser
-  gas laser
-  liquid dye laser

He – Ne laser is

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5 responses



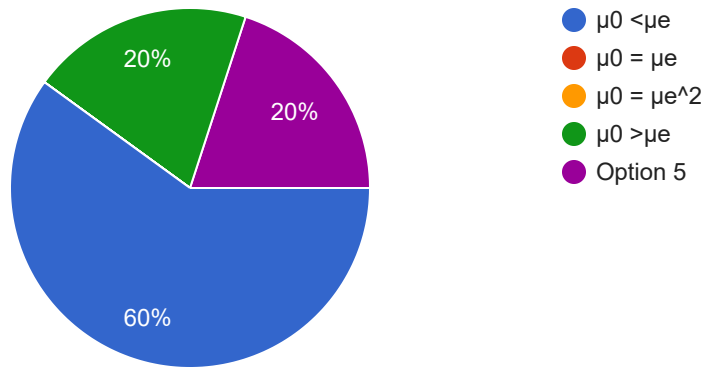
-  semiconductor laser
-  crystalline solid laser
-  gas laser
-  liquid dye laser



A double refracting crystal is a positive crystal when....

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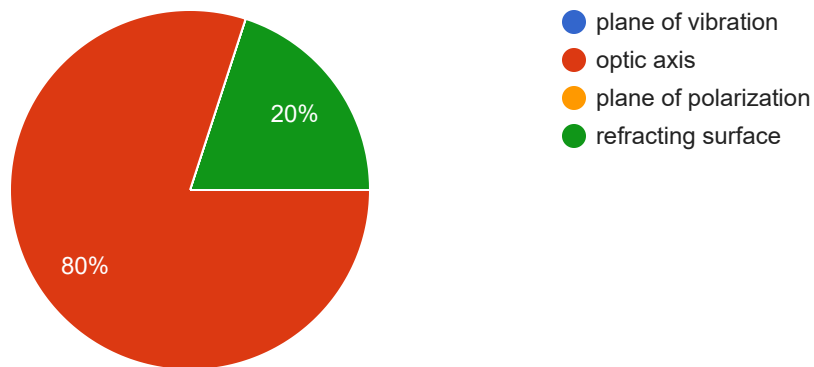
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The O-ray and E-ray have same velocity inside the crystal along-----
direction

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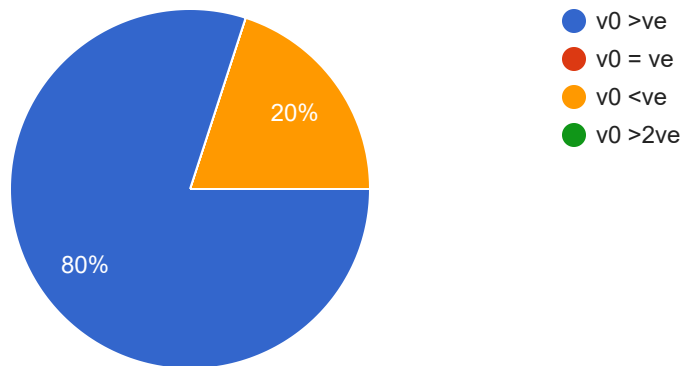
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For negative crystal in double refraction....

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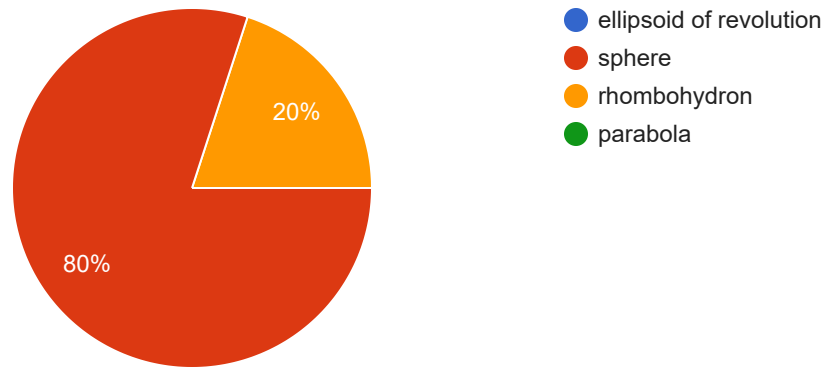
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The wave of surface for E-ray in double refracting crystal is....

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5 responses



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