

Examrace

Competitive Exams: Physics MCQs (Practice_Test 14 of 35)

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1. Which one of the following plane transmission gratings of width W , and number of lines per centimetre N . Will have the maximum resolving power in the first order?
 - a. $W = 1 \text{ cm}$, $N = 5000$
 - b. $W = 1.5 \text{ cm}$. $N = 4000$
 - c. $W = 2 \text{ cm}$, $N = 2400$
 - d. $W = 3 \text{ cm}$: $N = 1500$
2. A grating which would be most suitable for constructing a spectrometer for the visible and ultraviolet region, should have
 - a. 100 lines/cm
 - b. 1000 lines/cm
 - c. 10,000 lines/cm
 - d. 10,00, 000 lines/cm
3. A parallel beam of light of wavelength 600 nm gets diffracted by a single-slit of width 0.2 mm. The angular divergence of the first maxima of diffracted light is
 - a. $6 \times 10^{-3} \text{ rad}$
 - b. $3 \times 10^{-3} \text{ rad}$
 - c. $4.5 \times 10^{-2} \text{ rad}$
 - d. $9.0 \times 10^{-2} \text{ rad}$
4. Two polarizing sheets have their polarizing directions parallel so that the intensity of the transmitted light is maximum. If the intensity is to drop by one half then either of the two sheets must be turned by
 - a. 30 and 135
 - b. 45 and 1200
 - c. 300 and 1200
 - d. + 45 and 135

5. If t is the minimum thickness of a quarter wave plate needed to convert un-polarized light of wavelength 480 nm to circularly polarized light, then the corresponding thickness of a quarter wave plate for wavelength 600 nm is
- 0.56 t
 - 0.75 t
 - 1.25 t
 - 1.44 t
6. The superposition of two plane polarized lights in two mutually perpendicular directions given by $x = 4 \sin (wt + p/4)$ $y = 5 \sin (wt + \frac{3}{4} p)$ will result in
- plane polarized light
 - un-polarized light
 - elliptically polarized light
 - circularly polarized light
7. In the scattering of light, the ratio of the intensities of light scattered at 300 nm to that of 600 nm is
- 2
 - 4
 - 8
 - 16
8. In order to observe Raman effect, the wavelength of the source used
- should be in the visible region only
 - should be in the infra-red region only
 - should be in the ultraviolet region only
 - can be anywhere in the electromagnetic spectrum
9. When a gas is subjected to an adiabatic change, the gas is
- thermally isolated from its surroundings
 - mechanically isolated from its surroundings
 - in thermal as well as in mechanical contact with its surroundings
 - in thermal contact with its surroundings
10. Two plates of same thickness form a composite insulating plate, the temperature on one side of which is 0°C and that on the other side 60°C. If the ratio of thermal

conductivities is 3: 1 and the more conducting plate faces 00C, then the temperature of the interface, will be

- a. 45 degree C
- b. 40 degree C
- c. 20 degree C
- d. 15 degree C

11. The Clausius-Clapeyron equation indicates that an increase in pressure increases the melting point, in the case of

- a. all substances
- b. substances which expand on solidification
- c. substances which contract on solidification
- d. substances which neither extend nor contract on solidification

12. Match List I with List II and select the correct answer:

List-I (Process)	List-II (Description)
A. Isothermal process	1. No heat exchange
B. Isentropic process	2. Constant temperature
C. Isochoric process	3. Constant pressure
D. Isobaric process	4. Constant volume
	5. Constant enthalpy

A B C D

- a. 2 1 5 4
- b. 3 2 4 5
- c. 2 1 4 3
- d. 1 5 2 3

13. A system absorbs 1.5×10^3 J of energy as heat and produces 500 J of work. The change in the internal energy of the system will be

- a. 50J

- b. 100J
 - c. 150 J
 - d. 1000 J
14. If a capacitor of 1mF, charged to a potential of 300 V, is discharged through a resistor kept at room temperature, then the entropy change of the universe, in J/o K is equal to
- a. zero
 - b. 0.4×10^{-4}
 - c. 1.5×10^{-4}
 - d. 4.0×10^{-4}
15. A refrigerator exhausts
- a. less heat than it absorbs from its contents
 - b. the same amount of heat it absorbs from its contents
 - c. more heat than it absorbs from its contents
 - d. less, more or the same heat depending on the surrounding temperature

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