Question 1

Time left 0:44:53

ot yet answered

Marked out of 2.00

The absolute index of refraction of the first medium is equal to 5, of the second medium - 1.8. Define the ratio of speeds V_2 / V_1, if the speed of light in the first medium is V_1 and in the second medium -V_2 (inscribe just number into the data field, e.g. 1.234)

.

Answer:

Question 2

Not yet answered

Marked out of 2.00

The interference pattern is observed on the screen. The wavelength of light is equal to 4000 A^0 (A^0 is Angstrom). The order of interference for maxima (bright lines) is equal to 4, define the corresponding path lengths difference of waves in Angstroms (inscribe just number into the data field, e.g. 1.234).

.

Answer:

Question 3

Not yet answered

Marked out of 2.00

The angle between the axes of polarizer and analyzer is equal 15^0. Define the I_A/I_P - a ratio of intensities of light passed in analyzer (I_A) and in polarizer (I_P) (inscribe just number into the data field, e.g. 1.23).

.

Answer:

Question 4

Not yet answered

Marked out of 2.00

The wavelength of light has increased in 4 times. Intensity of a scattered light will be decreased in ----- times (inscribe just number into the data field, e.g. 1,234)

Answer:

Question 5

Not yet answered

Marked out of 2.00

Temperature (T) of black-body has increased in 6 times. The wavelength corresponding to the maximum value of radiating ability of black-body will be decreased in ----- times (inscribe just number into the data field, e.g. 1.234).

.

Answer:

Question 6

Not yet answered

Marked out of 2.00

Calculate the energy of $2*10^{20}$ photons in Joules, if the frequency of photons is $5*10^{14}$ Hertz. Planck's constant $h=6.6*10^{-34}$ J.s (carry out the calculations with an accuracy of 0,001, inscribe just number into the data field, e.g. 1.234).

.

Answer:

Question 7

Not yet answered

Marked out of 2.00

Determine the “cut-off” frequency for photoelectric effect in Tera-Hertzes, if the energy required to get an electron out through the surface (work function) is 2 eV, Planck’s constant h=6,6*10^{-34} J.s, 1 eV=1,6*10^{-19} J, 1 Tera-Hertz= 1,0*10^{12} Hertz (carry out the calculations with an accuracy of 0,0001, inscribe just number into the data field, e.g. 1.234).

.

Answer:

Question 8

Not yet answered

Marked out of 2.00

Determine the wave number N (sm^{-1}) corresponding the spectral lines of Hydrogen atom's Lyman series, if number of line is 3 and Rydberg constant $R=10,97*10^4$ sm^{-1} (carry out the calculations with accuracy of 0,0001, inscribe just number into the data field, e.g. 1.2345).

.

Answer:

Question 9

Not yet answered

Marked out of 2.00

In the substance of thickness 40 meter - the intensity of passing radiated γ rays is reduced e-times. Calculate the linear coefficient of absorption (carry out the calculations with an accuracy of 0.0001, inscribe just number into the data field, e.g. 1.234).

.

Answer:

Question 10

Not yet answered

Marked out of 1.00

According to the law of reflection: incident ray, reflected ray, and the perpendicular to the surface at the point of incidence lie in ---- .

Select one:

- a. the same plane
- b. the intersected planes
- c. different planes
- d. the plane of boundary surface between two media

Question 11

Not yet answered

Marked out of 1.00

Which of the following is true about light with a single wavelength?
I) It can be refracted
II) It cannot be dispersed
III) It can be reflected

Select one:

a. I and III only

b. II and III only

c. I and II only

d. None

e. I, II and III

Question 12

Not yet answered

Marked out of 1.00

Is it true or false: "The waves of equal frequency or wavelength and constant phase difference in time and in space, are called as coherent waves"

Select one:

True

False

Question 13

Not yet answered

Marked out of 1.00

Two waves are coherent if ----- (select two answers).

Select one or more:

- a. they are monochromatic with equal frequencies
- b. they aren't monochromatic
- c. phase difference of waves is independent of time
- d. phase difference of waves is dependent of time

Question 14

Not yet answered

Marked out of 1.00

Is it true or false: "Tyndall scattering is particularly applicable to colloidal mixtures and suspensions".

Select one:

- True
- False

Question **15**

Not yet answered

Marked out of 1.00

Is it true or false: A diffraction grating spreads out light into its component wavelengths, the resulting pattern is called a spectrum.

Select one:

- True
- False

Question **16**

Not yet answered

Marked out of 1.00

Is it true or false: “The directions of rays passing through a prism are different, because of their dependence on the index of refraction of material of prism and refraction angle of prism”.

Select one:

- True
- False

Question **17**

Not yet answered

Marked out of 1.00

The electric field vector vibrates at all angles and the amplitudes of an electric vector are equal in all directions. The light is called as:

Select one:

- a. partially polarized
- b. plane-polarized
- c. un-polarized

Question **18**

Not yet answered

Marked out of 1.00

According to the law of absorption of light $I = I_0 \, e^{-\mu x}$, where μ is the coefficient of:

Select one:

- a. Reflection
- b. Absorption
- c. Friction
- d. Refraction

Question 19

Not yet answered

Marked out of 1.00

Is it true or false: "When the angle of incidence is equal to Brewster's angle, and the incident light is un-polarized, it will cause linear polarization of the reflected light ".

Select one:

- True
- False

Question 20

Not yet answered

Marked out of 1.00

All bodies radiate energy in an amount that is proportional to ----- .

a. The square of Kelvin temperature

b. The third power of their Kelvin temperature and to their surface area

c. The fourth power of their Kelvin temperature and to their surface area

Question **21**

Not yet answered

Marked out of 1.00

Is it true or false: “Compton scattered short-wavelength light from various materials. He found the scattered light had slightly lower frequency than did the incident light”.

Select one:

- True
- False

Question **22**

Not yet answered

Marked out of 1.00

Define the equation (Einstein’s formula) for photoelectric effect (h is Planck’s constant, ν - frequency, A - work function, V-velocity):

a. $h\nu=A+V^2/2$

b. $h\nu=A+mV^2/2$

c. $h\nu=A+m/2$

d. $h\nu=A+mV/2$

Question 23

Not yet answered

Marked out of 1.00

Is it true or false: “Bohr theory postulated that, if an electron jumps to a lower state, it emits a photon whose energy equals the difference in energy between the two states”.

Select one:

- True
- False

Question 24

Not yet answered

Marked out of 1.00

The electron in the hydrogen atom passes from the n=4 energy level to the n=1 level. What is the maximum number of photons that can be emitted?

Select one:

- a. one
- b. two
- c. three
- d. four

Question 25

Not yet answered

Marked out of 1.00

3p orbital of a atom has ----- .

Select one:

- a. two spherical and one non spherical node
- b. two spherical nodes
- c. two non spherical nodes
- d. one spherical and two non spherical nodes

Question 26

Not yet answered

Marked out of 1.00

The mass (A) number is equal to ----- (Z atomic number, N –neutrons).

Select one:

- a. $A=N^2+Z^2$
- b. $A=N+Z$
- c. $A=N+Z^2$

Question **27**

Not yet answered

Marked out of 1.00

The decay of a nucleus by emission of ----- , we call Gamma (γ) decay:

Select one:

- a. Nuclei of helium atoms
- b. Photons having very high energy
- c. Electrons

Question **28**

Not yet answered

Marked out of 1.00

The half-life of one isotope of radium is about 1,600 years. In a given sample of this isotope, 15 divided by 16 of the radium atoms will decay in a time most nearly equal to ----- .

Select one:

- a. 6400 years
- b. 3200 years
- c. 1000 years
- d. 1500 years

Question 29

Not yet answered

Marked out of 1.00

Einstein's general expression for the energy is ----- (m is the mass, c - speed).

Select one:

- a. $E=mc$
- b. $E=m^2c$
- c. $E=mc^2$

Question 30

Not yet answered

Marked out of 1.00

Is it true or false: “The act of observing produces a significant uncertainty in either the position or the momentum of the electron”.

Select one:

- True
- False

Question 31

Not yet answered

Marked out of 1.00

Is it true or false: “The square of the wave function at a certain point in space and time represents the probability of finding the electron at the given position and time”.

Select one:

- True
- False