

Question 1

Time left 0:59:00

Not yet answered

Marked out of 2.00

Calculate the magnetic flux passing through the loop area of 5 m^2 . Magnetic field of 3 T creates the angle of 60° to the line drawn perpendicular to the face of the loop (inscribe in the field the value, e.g. 1,234).

Answer:

Question 2

Not 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 3

Not yet answered

Marked out of 2.00

The interference pattern is observed on the screen. The wavelength of light is equal to 4000 \AA (\AA 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).

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Answer:

Question 4

Not yet answered

Marked out of 2.00

The angle between the axes of polarizer and analyzer is equal 45° . 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).

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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).

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Answer:

Question 6

Not yet answered

Marked out of 2.00

Calculate the energy of $2 \cdot 10^{20}$ photons in Joules, if the frequency of photons is $5 \cdot 10^{14}$ Hertz. Planck's constant $h = 6.6 \cdot 10^{-34}$ J.s (carry out the calculations with an accuracy of 0,001, inscribe just number into the data field, e.g. 1,234).

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Answer:

Question 7

Not yet answered

Marked out of 2.00

Determine the “cut-off” frequency for photoelectric effect in Tera-Hertz, if the energy required to get an electron out through the surface (work function) is 2 eV, Planck’s constant $h=6,6 \cdot 10^{-34}$ J.s, 1 eV= $1,6 \cdot 10^{-19}$ J, 1 Tera-Hertz= $1,0 \cdot 10^{12}$ Hertz (carry out the calculations with an accuracy of 0,0001, inscribe just number into the data field, e.g. 1,234).

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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 $R=10,97 \cdot 10^4 \text{ sm}^{-1}$ (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 1.00

Electric (I) current is (t is the time):

Select one:

- a. $I=qt$
- b. $I=q^2t$
- c. $I=q/t$

Question **10**

Not yet answered

Marked out of 1.00

In SI units system the units of Electric Field Strength are ----- .

Select one or more:

- a. Volt
- b. V/m
- c. N/C
- d. Ampere

Question **11**

Not yet answered

Marked out of 1.00

Is it true or false: „Kirchhoff’s second rule or loop rule is based on the conservation of energy.“

Select one:

- True
- False

Question 12

Not yet answered

Marked out of 1.00

Work done in an electric circuit is ----- (I is the current, R - resistance).

Select one:

- a. $A=I^2Rt$
- b. $A=IR^2t$
- c. $A=IRt$

Question 13

Not yet answered

Marked out of 1.00

Ohm's law in differential form is ----- (E is the electric field strength).

Select one:

- a. $j=E/\sigma$
- b. $j=\sigma/E$
- c. $j=\sigma E$

Question 14

Not yet answered

Marked out of 1.00

Is it true or false: „The magnetic field lines are circles with the wire at their center.“

Select one:

- True
- False

Question 15

Not yet answered

Marked out of 1.00

The force (Lorentz's Force) acting on a charged particle (q) by means of a magnetic field (B) is given by the formula (v is the velocity):

Select one:

- a. $F = qBsina/v$
- b. $F = qvBsina$
- c. $F=vBsina/q$

Question 16

Not yet answered

Marked out of 1.00

Two parallel wires with the same current (I) exert forces on each other with equal magnitudes. What happens to the magnitude of this force if the value of the current (I) in wires is halved?

- a. The magnitude is quartered
- b. The magnitude does not change
- c. The magnitude is quadrupled
- d. The magnitude is halved
- e. The magnitude is doubled

Question 17

Not yet answered

Marked out of 1.00

According to Faraday's law of induction $E = -d\Phi/dt$, quantity - Φ is called as:

- a. magnetic flux
- b. electric strength
- c. electric potential
- d. phase

Question 18

Not yet answered

Marked out of 1.00

LC circuit contains the ----- .

- a. capacitor and coil
- b. capacitor only
- c. resistor only
- d. coil only

Question 19

Not yet answered

Marked out of 1.00

Thomson's formula is (C is capacitance):

- a. $T = 2\sqrt{LC}$
- b. $T = \pi\sqrt{LC}$
- c. $T = 2\pi\sqrt{LC}$

Question 20

Not yet answered

Marked out of 1.00

According to the law of refraction of light ($n = \sin(a)/\sin(b)$), n is named as:

Select one:

- a. The angle of refraction
- b. The relative index of refraction
- c. The absolute index of refraction

Question 21

Not yet answered

Marked out of 1.00

Which of the following is (are) true about light?

I) It is an electromagnetic wave

II) It does not propagate in a vacuum

III) Its maximum speed in vacuum is approximately 3×10^8 m/s

Select one:

- a. III only
- b. I and III only
- c. I, II and III
- d. I only
- e. I and II only

Question 22

Not yet answered

Marked out of 1.00

The absolute index of refraction of the first material is n_1 and of the second material n_2 . The total internal reflection can occur at the critical angle (γ), which is determined by the expression:

- a. $\sin \gamma \leq n_1/n_2$
- b. $\sin \gamma \leq n_2/n_1$
- c. $\sin \gamma \leq 1/n_2$
- d. $\sin \gamma \leq 1/n_1$

Question 23

Not yet answered

Marked out of 1.00

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

Select one or more:

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

Question 24

Not yet answered

Marked out of 1.00

A deflection (deviation) from a rectilinear direction of propagation of light wave in a homogeneous medium is named ----- of light.

Select one:

- a. the dissipation
- b. the interference
- c. the dispersion
- d. the diffraction

Question 25

Not yet answered

Marked out of 1.00

In the case of abnormal dispersion, the index of refraction is greater for ----- .

Select one:

- a. the lower speeds of light
- b. the longer wavelengths
- c. the shorter wavelengths

Question 26

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. un-polarized
- c. plane-polarized

Question 27

Not yet answered

Marked out of 1.00

According to the law of absorption of light, the intensity of light after passing the medium ----- .

Select one:

- a. increases linearly
- b. increases exponentially
- c. decreases exponentially
- d. decreases linearly

Question 28

Not yet answered

Marked out of 1.00

The photoelectric effect occurs in metals if ----- than ν_{\min} , which is called the red border (cutoff frequency) of the photoelectric effect.

Select one:

- a. wavelength is greater
- b. frequency is less
- c. frequency is greater
- d. intensity is greater

Question 29

Not yet answered

Marked out of 1.00

Is it true or false: "Bohr theory postulated that electrons bound in an atom can only occupy orbits for which the angular momentum is quantized, which results in discrete values for the radius and energy".

Select one:

- True
- False

Question 30

Not yet answered

Marked out of 1.00

Is it true or false: "The transformation of the parent into the daughter nucleus is called transmutation of the elements".

Select one:

- True
- False

Question 31

Not yet answered

Marked out of 1.00

Select the corresponding definitions:

alpha-decay

gamma-decay

beta-decay

Question **32**

Not yet answered

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

Select one:

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

