Question 1
Not yet answered
Marked out of 2.00

Calculate the magnetic flux passing through the loop area of 5 m². 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 $4000 \text{Å}$ ($\text{Å}$ 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 4

Not yet answered
Marked out of 2.00

The angle between the axes of polarizer and analyzer is equal $45^0$. 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:
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:

Calculate the energy of \(2 \times 10^{20}\) photons in Joules, if the frequency of photons is \(5 \times 10^{14}\) Hertz. Planck's constant \(h=6.6 \times 10^{-34}\) J.s (carry out the calculations with an accuracy of 0.001, inscribe just number into the data field, e.g. 1,234).

Answer:
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 $h = 6.6 \times 10^{-34}$ J.s, 1 eV = $1.6 \times 10^{-19}$ J, 1 Tera-Hertz = $1.0 \times 10^{12}$ Hertz (carry out the calculations with an accuracy of 0.0001, inscribe just number into the data field, e.g. 1,234).

Answer:
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 \( R=10,97\times10^4 \) sm\(^{-1}\) (carry out the calculations with accuracy of 0,0001, inscribe just number into the data field, e.g. 1.2345).

Answer:

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

Select one:
- a. \( I=qt \)
- b. \( I=q^2t \)
- c. \( I=q/t \)
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

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=I²Rt
- b. A=IR²t
- 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/σ
- b. j=σ/E
- c. j=σE
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.  \( F=vBsina/q \)
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

According to Faraday's law of induction $E=-\frac{d\Phi}{dt}$, quantity $\Phi$ 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. \( T = 2\pi \sqrt{LC} \)
According to the law of refraction of light \( n = \frac{\sin(a)}{\sin(b)} \), \( n \) is named as:

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

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 \( 3 \times 10^8 \) 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
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 ($\gamma$), which is determined by the expression:

- a. $\sin \gamma \leq \frac{n_1}{n_2}$
- b. $\sin \gamma \leq \frac{n_2}{n_1}$
- c. $\sin \gamma \leq \frac{1}{n_2}$
- d. $\sin \gamma \leq \frac{1}{n_1}$

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
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

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 \( v_{\text{min}} \), 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
Is it true or false: “The transformation of the parent into the daughter nucleus is called transmutation of the elements”.

Select one:
- True
- False

Select the corresponding definitions:
- alpha-decay
- gamma-decay
- betta-decay
Question 32
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=mc²
  ○ c.   E=m²c