# Question Bank-Basic Physics(311305) (K scheme) <br> <br> Unit test-II 

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Academic year:2023-2024
Sem-1
Course:All

## Unit 2 : Electricity,Magnetism \& Semiconductors (CO2) And Unit 3: Thermometry And Fibre Optics

1) The principle of conservation of charges states that the total charge on an isolated system remains $\qquad$ .
a) Constant
c) Variable
b) Small
d) Large
2) If a body possesses an equal number of positive and negative charges then the body is electrically $\qquad$ .
a) Positive
c) Neutral
b) Negative
d) Positive or Negative
3) As the distance between 2 electric charges decreases, the electrostatic force between them $\qquad$ .
a) Decreases
c) Increases
b) Remains Same
d) Decreases then increases
4) The unit of electric charge is $\qquad$ .
a) Joule
c) Webber
b) Ampere
d) Coulomb
5) The material that does not allow current to flow through it but shows electrical effects are called $\qquad$ .
a) Conductor
c) Electric
b) Dielectrics
d) Permittivities
6) The unit of electric field intensity is $\qquad$ .
a) $\mathrm{C} / \mathrm{N}$
b) $\quad \mathrm{N} / \mathrm{C}$
c) N * C
d) $\mathrm{Ohm} /$ meter
7) Electric Potential V is given by the relation $\qquad$ .
a) $\mathrm{Q} / \mathrm{W}$
b) $W^{*} \mathrm{Q}$
c) $\mathrm{W} / \mathrm{Q}$
d) $N / C$
8) Electric current is defined as the $\qquad$ .
a) Product of Electric charge and time
b)Force per unit positive charge
c) Time per unit electric charge
d)Electric charge per unit time
9) As the length of the wire increases, the conductivity of conductor $\qquad$ .
a) Increases
c) Remains same
b) Decreases
d) Decreases then increases
10) The unit of specific resistance is $\qquad$ .
a) $\mathrm{Ohm} /$ meter
c) Ohm- meter
b) Ohm- ampere
d) ohm/ampere
11) The galvanometer is converted into an ammeter by connecting
a) High resistance in parallel
b)Low resistance in parallel
c) High resistance in series
d)Low resistance in series
12) Ammeter is always connected in $\qquad$ . And voltmeter is connected in $\qquad$ with the circuit.
a) Series, Series,
c) parallel, parallel
b) series, parallel
d), series-parallel
13) Magnetic intensity is a $\qquad$ .
a) Scalar quantity

## c) vector quantity

b) Fundamental quantity
d) none of the above
14) Outside the bar magnet, the magnetic lines of force move
a) North to south
c) south to north
b) East to west
d) west to east
15). To obtain maximum resistance, the given resistors should be connected in
a) Series
c) parallel
b)Combination of series and parallel
d) none of these
16). If the length and cross-sectional area of the wire are doubled, its resistance will be
a) unchanged
c) halved
b) doubled
d) four times
17). out of the following which is not a semiconductor material?
a) Si
c) Ge
b) GaAs
d) Carbon
18). Majority charge carriers in p-type semiconductors are-
a) electrons
c) holes
b) free electrons
d) None of these
19). Semiconductor is the material having conductivity----------
a) Less than Insulators
b) Less than conductor and insulators
c) Less than conductor and more than insulators
d) None of these
20). The process of adding an impurity to a semiconductor $(\mathrm{Si}, \mathrm{Ge})$ is known as- $\qquad$
a) Impurification
c) addition
b) doping
d) extrinsic
21). The minimum voltage required for conducting the diode is known as $\qquad$
a) operating voltage
c) conducting voltage
b) Knee voltage or cut-in voltage
d) critical voltage
22). As operating voltage increases, static resistance of a diode---------
a) increases
c) decreases
b) increase then decreases
d) decreases then increases
23). Rectifier is a circuit which converts $\qquad$
a) high A.C. into low A.C.
c) low A.C. into high A.C.
b) D.C. into A.C.
d) A.C. into D.C.
24). A wave of light of single frequency or wavelength is called $\qquad$
a) polychromatic
c) monochromatic light
d) coherent
d) Non coherent
25). optical fiber carries -from one end to another end, because of multiple T. I.R.
a) electric current
c) fluid
b) sound

## d) light

26) The state in which temperature of substance goes on increasing w.r.t time is called as,
a)Variable state
b)Steady state
c) Normal state
d)Critical state
27) Calculate specific resistance of material of a cable 15 m long having resistance of $2 \Omega \&$ area $2 \times 10^{-6} \mathrm{~m}$.
a) $0.266 \mathrm{X} 10^{-7} \Omega \mathrm{~m}$
b) $2.66 \mathrm{X} \quad 10^{-6} \Omega \mathrm{~m}$
c) $0.266 \times 10^{-6} \Omega \mathrm{~m}$
d) $26.6 \mathrm{X} \quad 10^{-7} \Omega \mathrm{~m}$
28) If three resistances of $1 \Omega, 10 \Omega$ and $100 \Omega$ are connected in parallel then the equivalent resistance will be $\qquad$
a) Greater than $100 \Omega$
b)Less than $\mathbf{1} \Omega$
c)Between $1 \Omega \& 100 \Omega$
d)None of these
29) If C is temperature in ${ }^{\circ} \mathrm{C}, \mathrm{F}$ is temperature in ${ }^{\circ} \mathrm{F}, \mathrm{K}$ is temperature in ${ }^{0} \mathrm{~K}$ then,
a) $C=\frac{F-32}{1.8}$
b) $\mathrm{C}=\mathrm{K}-273$
c) $\mathrm{F}=1.8 \mathrm{C}+32$
d) All of these
30) The SI unit of coefficient of thermal conducticity is,
a) Watt-m- ${ }^{0} \mathrm{~K}$
b) Watt $/ \mathrm{m}-{ }^{0} \mathrm{~K}$
c) $m^{0} K /$ Watt
d) $\mathrm{m} / \mathrm{watt}^{0} \mathrm{~K}$
31) Thermal resistor is $\qquad$ the thermal conductivity.
a) reciprocal of
b) Equal to
c)Addition of
d)None of these
32)Davy's safety lamp is covered by,
a)Insulating material
b) Good conducting material
c)Semiconducting material
d)None of these
33)A hot air balloon is an example of,
a)Boyle's law
b)Charle's law
c) Gay lussac's law
d)Newton's law
34)At N.T.P normal temperature $=$ $\qquad$
a) $273^{\circ} \mathrm{C}$
b) $-273^{\circ} \mathrm{C}$
c) $273^{\circ} \mathrm{K}$
d) $0^{0} \mathrm{~K}$
35)A certain mass of gas occupies $40 \mathrm{~cm}^{3}$ at $27^{\circ} \mathrm{C}$. Find its volume at $57^{\circ} \mathrm{C}$, Pressure is constant
a) $34 \mathrm{~cm}^{3}$
b) $38 \mathrm{~cm}^{3}$
c) $44 \mathrm{~cm}^{3}$
d) $50 \mathrm{~cm}^{3}$
36)When light travel from one medium to another medium there is change in -----
a) velocity
b) direction
c) wavelength
d) all of these
32) As per refraction, when light enters from glass (denser) to air to (rare) medium-----
a) $\mathrm{i}<\mathbf{r}$
b) $i>r$
c) $r<i$
d) $i=r$
33) Conditions for T.I.R.(Total internal reflection)----------
a) (only) angle of incidence should be greater than $\theta_{c}$ (critical angle)
b) (only) $\mu_{1}$ should be greater than $\mu_{2}$
c) both (a) and (b)
d) none of these
34) The sine of acceptance angle of the optical fiber is known as,
a)Acceptance angle

## b)Numerical aperture

c) Acceptance cone
d)All of these
40) Based on variation of R.I of core, the two types of optical fiber are,
a)Step index and single mode
b)Step index and Graded index
c) Graded index and multimode
d)Single mode and multimode
41) Calculate velocity of light in glass of R.I 1.6.
a) $1.5 \times 10^{8} \mathrm{~m} / \mathrm{s}$
b) $2 \mathrm{X} 10^{8} \mathrm{~m} / \mathrm{s}$
c) $3 \mathrm{X} 10^{8} \mathrm{~m} / \mathrm{s}$
d) $1.875 \times 10^{8} \mathrm{~m} / \mathrm{s}$
42) Find the angle of incidence if angle of refraction is $30^{\circ}$ for a glass having R.I 1.5.
a) $35.23^{0}$
b) $\mathbf{4 8 . 5 9}{ }^{\circ}$
c) $40.12^{0}$
d) $55^{0}$
43) Thickness of a plate is 8 cm . the temperature of two faces are $100^{\circ} \mathrm{C}$ and $-20^{\circ} \mathrm{C}$. Find the temperature gradient.
a) $10^{0} \mathrm{C} / \mathrm{cm}$
b) $20^{\circ} \mathrm{C} / \mathrm{cm}$
c) $25^{\circ} \mathrm{C} / \mathrm{cm}$
d) $15^{0} \mathrm{C} / \mathrm{cm}$
44) A gas at $25^{\circ} \mathrm{C}$ has its temperature raised so that its volume doubles, Pressure remains constant. Find its final temperature.
a) $273^{\circ} \mathrm{C}$
b) $323^{\circ} \mathrm{C}$
c) $293^{\circ} \mathrm{C}$
d) $300^{\circ} \mathrm{C}$
45) For 1 kg mole of a gas, the value of universal gas constant $R$ in equation, $P V=R T$ is,
a) $83.149 \mathrm{~J} /{ }^{\circ} \mathrm{K} \mathrm{kg}$ mole
b) $0.83149 \mathrm{~J} /{ }^{0} \mathrm{~K} \mathrm{~kg}$ mole
c) $8314.91 \mathrm{~J} /{ }^{0} \mathrm{~K} \mathrm{~kg}$ mole
d) $4200 \mathrm{~J} /{ }^{0} \mathrm{~K} \mathrm{~kg}$ mole
46) The volume of a certain quantity of a gas at NTP is 24 liters. What will be pressure exerted by same quantity of gas in a gas cylinder of 20 liters at $27^{\circ} \mathrm{C}$.
a) 100.22 cm of $\mathbf{H g}$
b) 70 cm of Hg
c) 90 cm of Hg
d) 120.7 cm of Hg
47) The light gathering power of optical fiber is called as,
a)Acceptance angle
b)Numerical aperture
c) Acceptance cone
d)All of these
48) As per refraction, when light enters from air to (rare) to glass (denser) medium-----
a) $i<r$
b) $r>i$
c) $i=r$
d) $\mathbf{i}>\mathbf{r}$
49) The critical angle $\theta_{c}$ is defined as the angle of incidence at which angle of refraction is----
a) $45^{0}$
b) $90^{0}$
c) less than $45^{\circ}$
d) greater than $90^{0}$
50) Following is the one necessary condition for propagation of light through optical fiber.
a) $\mu$ core $>\mu$ cladding
b) $\mu$ core $<\mu$ cladding
c) $\mu$ core $=\mu$ cladding
d) None of these
51) In graded index optical fiber,the R.I of,
a)Core is uniform throughout the fiber $\quad$ b)Core \& cladding is same
c) Core is not uniform $\&$ it decreases gradually from core axis to boundary of core
d)None of these
52) The refractive index of water is 1.3 . The refractive index of glass is 1.5 Find the velocity of light in glass.
a) $1.5 \times 10^{8} \mathrm{~m} / \mathrm{s}$
b) $\mathbf{2} \times 10^{8} \mathbf{m} / \mathrm{s}$
c) $3 X 10^{8} \mathrm{~m} / \mathrm{s}$
d) $1.875 \times 10^{8} \mathrm{~m} / \mathrm{s}$
53) The coefficient of thermal conducticity of good conductors of heat is $\qquad$
a) low
c) medium

## b) high

d) none of these
54) Convert $22{ }^{\circ} \mathrm{C}$ to ${ }^{0} \mathrm{~F}$
a) $71.6^{0} \mathrm{~F}$
b) $34{ }^{0} \mathrm{~F}$
c) $251^{\circ} \mathrm{F}$
d) $76.1{ }^{0} \mathrm{~F}$
55) Two like charges of $20 \mu \mathrm{C}$ are placed 5 cm apart in a medium of dielectric constant 2.5 Calculate force between them
a) 288 N
b) 144 N
c) $\mathbf{5 7 6 N}$
d) 1152 N
56) The amount of heat required to raise the temperature of $\qquad$ of water by $1^{\circ} \mathrm{C}$ is called as Kilocalorie.
a) 1 gm
b) 1 kg
c) 1 liter
d) 1 ml
57) Calculate critical angle if R.I of core is 1.55 and R.I of cladding is 1.35
a) $\mathbf{6 0 . 5 7}{ }^{0}$
b) $54.23^{\circ}$
c) $57.25^{0}$
d) $62.85^{\circ}$

58 ) A battery of emf 6 V is connected across a resistance of $12 \Omega$, calculate the current flowing through the resistance.
a) 72 A
b) 0.5 A
c) 0.2 A
d) 2 A
59) The mechanical equivalent of heat $(\mathrm{J})=$ $\qquad$
a) $4.2 \mathrm{~J} / \mathrm{Cal}$
b) $4.2 \mathrm{~J} / \mathrm{kcal}$
c) $4200 \mathrm{~J} / \mathrm{cal}$
d) $420 \mathrm{~J} / \mathrm{cal}$
60) The magnetic lines of force are not affected by $\qquad$ material
a)Magnetic
c)Semi-magnetic
b)Non-Magnetic
d) both a \& c

