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भारत सरकार :: अंतरिक्ष विभाग
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Participant ID	
Participant Name	
Test Center Name	
Test Date	03/11/2022
Test Time	3:30 PM - 6:30 PM
Subject	SCIENTIFIC ASSISTANT (PHYSICS) Post Code 023

Section : **SCIENTIFIC ASSISTANT (PHYSICS) Post Code 023**

Q.1

During fusion of hydrogen into helium

(a) Energy is absorbed

(b) No change in energy

(c) Mass is increased due to energy absorption

(d) Mass is reduced due to the energy released

Ans ✗ A. a

✗ B. b

✗ C. c

✔ D. d

Question ID : **1703224858**
Status : **Answered**
Chosen Option : **C**

Q.2   The Compton effect with X-rays proves that

(a) X-rays have wave nature

(b) Electrons have wave nature

(c) X-rays can be scattered

(d) X-rays have corpuscular nature

Ans   ✗ A. a

✗ B. b

✗ C. c

✓ D. d

Question ID : **1703224849**
Status : **Answered**
Chosen Option : **C**

Q.3   The material used for fabrication of inner core of a conventional optical fiber is

(a) glass or plastic

(b) bimetallic

(c) copper

(d) liquid

Ans   ✓ A. a

✗ B. b

✗ C. c

✗ D. d

Question ID : **1703224845**
Status : **Answered**
Chosen Option : **A**

Q.4   Solar cell works in which quadrant of I-V characteristics

(a)I- Quadrant

(b) IV- Quadrant

(c)II-Quadrant

(d) III-Quadrant

Ans   ✘ A. a

✔ B. b

✘ C. c

✘ D. d

Question ID : **1703224881**
Status : **Answered**
Chosen Option : **A**

Q.5   The correct order of layers of earth's atmosphere when arrange from closer to farther from earth

are.

(a)   Thermosphere, Mesosphere, stratosphere, troposphere.

(b)   Mesosphere, stratosphere, troposphere, Thermosphere

(c)   Troposphere, stratosphere, Mesosphere, Thermosphere

(d)   Troposphere, stratosphere, Thermosphere, Mesosphere

Ans   ✘ A. a

✘ B. b

✔ C. c

✘ D. d

Question ID : **1703224877**
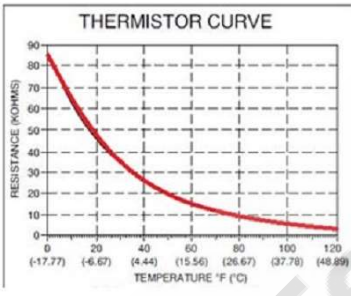Status : **Answered**
Chosen Option : **C**

Q.6   What is the energy of the emitted photoelectrons if frequency of light is 1×10^{15} Hz is incident on a

potassium target? Work function of potassium is 2.3eV and h=6.63$\times 10^{-34}$ m^2 kg s^{-1}

   (a)   1.84 eV

   (b)   1.64eV

   (c)   2.5 eV

   (d)   3.64 eV

Ans   ✔ A. a

   ✘ B. b

   ✘ C. c

   ✘ D. d

Question ID : **1703224846**
Status : **Answered**
Chosen Option : **A**

Q.7   The figure shows thermistor characteristic that to be connected to a linearly operating

resistance to temperature conversion system. The system operates in three linear ranges

nearest to the curve for the graph shown in figure.

THERMISTOR CURVE

The output of the system will show error more in range from

   (a) 0 to 20 Fahrenheit

   (b) 20 to 80 Fahrenheit

   (c) 80 to 120 Fahrenheit

   (d) Error is same in all cases

Ans   ✘ A. a

   ✔ B. b

   ✘ C. c

   ✘ D. d

Question ID : **1703224888**
Status : **Answered**
Chosen Option : **C**

Q.8 Diamond has which type of Bravais lattice

(a) fcc

(b) fce

(c) bcc

(d) hcp

Ans   ✔ A. a

 ✘ B. b

 ✘ C. c

 ✘ D. d

> Question ID : **1703224870**
> Status : **Answered**
> Chosen Option : **A**

Q.9 Most of the energy that heats earth atmosphere is

(a)   Visible light

(b)   ultraviolet light

(c)   blue light

(d)   Infrared radiation

Ans   ✘ A. a

 ✘ B. b

 ✘ C. c

 ✔ D. d

> Question ID : **1703224862**
> Status : **Answered**
> Chosen Option : **B**

Q.10   Two sources of light are coherent if they emit rays of

(a) Same wavelength

(b) The same amplitude

(c) Same amplitude and wavelength

(d) Same wavelength with a constant phase difference

Ans   ✗ A. a

✗ B. b

✗ C. c

✓ D. d

Question ID : **1703224843**
Status : **Answered**
Chosen Option : **D**

Q.11   The lifetime for the excited hydrogen atom is of the order of

(a) 10^{-9} sec

(b) 10^{9} sec

(c) 10^{-8} sec

(d) 10^{8} sec

Ans   ✗ A. a

✗ B. b

✓ C. c

✗ D. d

Question ID : **1703224844**
Status : **Answered**
Chosen Option : **C**

Q.12   In which law, the energy radiated is directly proportional to the fourth power of Kelvins temperature.

(a) Karl-Weins law

(b) Rayleigh-Jeans law

(c) Stephens-Boltzman law

(d) Plancks

Ans   ✗ A. a

✗ B. b

✓ C. c

✗ D. d

Question ID : **1703224861**
Status : **Answered**
Chosen Option : **C**

Q.13   Radioactive materials can be identified by measuring their

(a) Hardness

(b) Density

(c) Mass

(d) Half life

Ans   ✗ A. a

✗ B. b

✗ C. c

✓ D. d

Question ID : **1703224860**
Status : **Answered**
Chosen Option : **D**

Q.14 The tunnelling in PN junction involves the leakage of which particles

    (a) α-particles

    (b) Electrons

    (c) Protons and neutrons

    (d) γ- Rays

Ans ✗ A. a

     ✔ B. b

     ✗ C. c

     ✗ D. d

Question ID : **1703224856**
Status : **Answered**
Chosen Option : **B**

Q.15 A stone of mass 'm' tied to one end of a string of length 'l' is rotated in a circle with the other end

of the string as the centre. The speed of the stone is 'v'. If the string breaks the stone will?

    (a) Move towards the centre

    (b) Move away from the centre

    (c) Move along the tangent

    (d) stop

Ans ✗ A. a

     ✗ B. b

     ✔ C. c

     ✗ D. d

Question ID : **1703224871**
Status : **Answered**
Chosen Option : **C**

Q.16

In a half-wave rectifier the r.m.s. value of the A.C. component of the wave is

(a) Equal to D.C. value

(b) More than D.C. value

(c) Less than D.C. value

(d) Zero

Ans ✗ A. a

✔ B. b

✗ C. c

✗ D. d

Question ID : **1703224853**
Status : **Answered**
Chosen Option : **C**

Q.17

The gravitational field inside a planet varies with the distance from the centre (r) as:

(a) $1/r$

(b) $1/r^2$

(c)   r

(d)   None of these

Ans ✗ A. a

✗ B. b

✔ C. c

✗ D. d

Question ID : **1703224885**
Status : **Answered**
Chosen Option : **C**

Q.18   In case of a simple pendulum, the cause of damping is

(a) Gravity

(b) Drag force of air

(c) Tension in the string

(d) None of these

Ans   ✗ A. a

✓ B. b

✗ C. c

✗ D. d

Question ID : **1703224835**
Status : **Answered**
Chosen Option : **B**

Q.19   Ferrites are

(a) Ferrimagnetic having large electrical conductivity

(b) Diamagnetic having large electrical conductivity

(c) Ferrimagnetic having negligible electrical conductivity

(d) None of the above

Ans   ✗ A. a

✗ B. b

✓ C. c

✗ D. d

Question ID : **1703224868**
Status : **Answered**
Chosen Option : **A**

Q.20

Packing fraction has maximum value for

    (a) fcc structure

    (b) bcc structure

    (c) sc structure

    (d) All the above

Ans   ✔ A. a

       ✖ B. b

       ✖ C. c

       ✖ D. d

Question ID : **1703224857**
Status : **Answered**
Chosen Option : **A**

Q.21

A pure semiconductor behaves as insulator at

    (a) 273 K

    (b) 300 K

    (c) 0 K

    (d) -273 K

Ans   ✖ A. a

       ✖ B. b

       ✔ C. c

       ✖ D. d

Question ID : **1703224866**
Status : **Answered**
Chosen Option : **C**

Q.22 A piece of copper and another of a Germanium are cooled from room temperature to 100° K. The resistance of

(a) Each of them increases

(b) Each of them decreases

(c) copper increases and germanium decrease

(d) copper decreases and germanium increases

Ans ✗ A. a

✗ B. b

✗ C. c

✓ D. d

Question ID : **1703224854**
Status : **Answered**
Chosen Option : **D**

Q.23 One AMU is equal to

(a) 1.66×10^{-27}kg

(b) 166×10^{-15}kg

(c) 166×10^{-20}kg

(d) none of the above

Ans ✓ A. a

✗ B. b

✗ C. c

✗ D. d

Question ID : **1703224859**
Status : **Answered**
Chosen Option : **A**

Q.24   Which of the following is not a unit of time

(a) Second

(b) Minute

(c) Hour

(d) Light year

Ans   ✗ A. a

✗ B. b

✗ C. c

✓ D. d

Question ID : **1703224889**
Status : **Answered**
Chosen Option : **D**

Q.25
An SCR is turned off by

(a) Reducing anode voltage to zero

(b) Reducing gate voltage to zero

(c) Reverse biasing the gate

(d) All the above

Ans   ✓ A. a

✗ B. b

✗ C. c

✗ D. d

Question ID : **1703224864**
Status : **Answered**
Chosen Option : **B**

Q.26

When a planet comes nearer to the sun its speed

(a) Increases

(b) Decreases

(c) Remains constant

(d) None of the above

Ans   ✔ A. a

✘ B. b

✘ C. c

✘ D. d

Question ID : **1703224851**
Status : **Answered**
Chosen Option : **B**

Q.27   Which of the following is a vector quantity?

(a)Relative permeability

(b) Magnetic field intensity

(c) speed

(d) None of the above

Ans   ✘ A. a

✔ B. b

✘ C. c

✘ D. d

Question ID : **1703224841**
Status : **Answered**
Chosen Option : **B**

Q.28   Dipole moment of a current loop does not depend upon

(a) Current in the loop

(b) Area of the loop

(c) Number of turns in the loop

(d) None of the above

Ans   ✗ A. a

✗ B. b

✗ C. c

✓ D. d

Question ID : **1703224867**
Status : **Answered**
Chosen Option : **D**

Q.29   Gamma rays are produced by:

(a) Electron capture

(b) Nuclear decay

(c) Proton-electron interactions

(d) Breaking molecular bonds

Ans   ✗ A. a

✓ B. b

✗ C. c

✗ D. d

Question ID : **1703224884**
Status : **Answered**
Chosen Option : **B**

Q.30 X- rays of wavelength 1.5 A° make a glancing angle of 30° in the first order when diffraction from

NaCl crystal. Find the lattice constant of NaCl.

a) 1.5 A°

b) 2.52 A°

c) 3.72 A°

d) 3.05 A°

Ans   ✔ A. a

✘ B. b

✘ C. c

✘ D. d

Question ID : **1703224869**

Status : **Answered**

Chosen Option : **B**

Q.31 A telescope of aperture 0.05 m views a wire gauge from a distance of 50m by using illuminating

light of wavelength 500 nm. The smallest structure in the wire gauge which it can clearly shows

is

(a) 1.2×10^{-7} m

(b) 1.0×10^{-3} m

(c) 5.5×10^{-5} m

(d) 6.1×10^{-4} m

Ans   ✘ A. a

✘ B. b

✘ C. c

✔ D. d

Question ID : **1703224842**

Status : **Not Answered**

Chosen Option : **--**

Q.32 The value of total potential difference created between the electrodes, when the cell is not

connected to an external circuit is known as its

(a) Electromotive force

(b) Electrostatic force

(c) Terminal voltage

(d) Electrochemical force

Ans   ✓ A. a

         ✗ B. b

         ✗ C. c

         ✗ D. d

Question ID : **1703224887**
Status : **Answered**
Chosen Option : **C**

Q.33 Which of the following transformation are replaced by the Lorentz transformation that confirms

the postulate of relativity?

(a)Galilean

(b) Maxwell

(c) Planks

(d) Newton's

Ans   ✓ A. a

         ✗ B. b

         ✗ C. c

         ✗ D. d

Question ID : **1703224872**
Status : **Answered**
Chosen Option : **A**

Q.34

The type of material which is repelled by the magnetic field is.

(a)Ferromagnetic.

(b) Paramagnetic.

(c)Diamagnetic.

(d) none of the above

Ans   ✘ A. a

   ✘ B. b

   ✔ C. c

   ✘ D. d

Question ID : **1703224880**
Status : **Answered**
Chosen Option : **C**

Q.35

As a star like the Sun evolves into a red giant, its core

(a) Expands and cools

(b) Expands and heats

(c) Contract and heats

(d) Turn in to iron

Ans   ✘ A. a

   ✘ B. b

   ✔ C. c

   ✘ D. d

Question ID : **1703224848**
Status : **Answered**
Chosen Option : **B**

Q.36   The self-inductance of the motor of an electric fan is 10 H. In order to impart maximum power at

50 Hz, it should be connected to a capacitance of

(a) 8 μF

(b) 6μF

(c) 4 μF

(d) 1 μF

Ans   ✗ A. a

✗ B. b

✗ C. c

✓ D. d

Question ID : **1703224840**
Status : **Answered**
Chosen Option : **C**

Q.37   What is the value of solar constant approximately?

(a) 1361 W/m^2

(b) 1000 W/m^2

(c) 750 W/m^2

(d) None of the above

Ans   ✓ A. a

✗ B. b

✗ C. c

✗ D. d

Question ID : **1703224863**
Status : **Answered**
Chosen Option : **B**

Q.38

A series LCR circuit, with the three impedances (R,C,L) being (4,5,8) ohms, has an overall impedance of:

    (a) 4 ohms

    (b) 5 ohms

    (c) 6 ohms

    (d) 8 ohms

Ans ✗ A. a

    ✓ B. b

    ✗ C. c

    ✗ D. d

Question ID : **1703224891**
Status : **Answered**
Chosen Option : **B**

Q.39

In a process where no heat enters or leaves the system is called as.

    (a) Isochoric Process

    (b) Isothermal Process

    (c) Adiabatic process.

    (d) Isobaric process.

Ans ✗ A. a

    ✗ B. b

    ✓ C. c

    ✗ D. d

Question ID : **1703224876**
Status : **Answered**
Chosen Option : **C**

Q.40

Impulse can be defined as

(a) Force x Distance.

(b) Force x momentum.

(c) Force x time.

(d) Mass x velocity

Ans   ✗ A. a

✗ B. b

✔ C. c

✗ D. d

Question ID : **1703224878**
Status : **Answered**
Chosen Option : **C**

Q.41   In Kroning Penney model of electrons in a linear lattice if the strength of the periodic potential

increases, the width of the allowed energy band

(a) Increases

(b) Remains constant

(c) Decreases

(d) None of these

Ans   ✗ A. a

✗ B. b

✔ C. c

✗ D. d

Question ID : **1703224865**
Status : **Answered**
Chosen Option : **C**

Q.42 There is no transfer of energy in which of the following waves?

(a) transverse

(b) Stationary

(c) Progressive

(d) electromagnetic

Ans ✗ A. a

✓ B. b

✗ C. c

✗ D. d

Question ID : **1703224832**
Status : **Answered**
Chosen Option : **B**

Q.43 The specially designed semiconductor diodes used as indicator lamps in electronic circuits are

(a) The switch

(b) The light emitting diode

(c) The photodiodes

(d) Solar cells

Ans ✗ A. a

✓ B. b

✗ C. c

✗ D. d

Question ID : **1703224852**
Status : **Answered**
Chosen Option : **B**

Q.44   The energy gap of pure Germanium is

(a) 0.7 eV

(b) 1.4eV

(c) 1.8eV

(d) 1.2eV

Ans   ✔ A. a

✘ B. b

✘ C. c

✘ D. d

Question ID : **1703224890**
Status : **Answered**
Chosen Option : **A**

Q.45   Which of the following is not a result of surface tension?

(a)Nearly spherical drop of rain

(b) Capillary rise

(c)Removal of dirt by soap or detergent

(d) Flow of liquid

Ans   ✘ A. a

✘ B. b

✘ C. c

✔ D. d

Question ID : **1703224873**
Status : **Answered**
Chosen Option : **D**

Q.46

The time period of satellite around earth is dependent of

    (a) The mass of the satellite

    (b) Radius of the orbit

    (c) Size of the satellite

    (d) None of them

Ans ✗ A. a

     ✔ B. b

     ✗ C. c

     ✗ D. d

Question ID : **1703224836**
Status : **Answered**
Chosen Option : **B**

Q.47

The degree of degeneracy of first excited state of hydrogen atom is

    (a) 6

    (b) 2

    (c) 8

    (d) 4

Ans ✗ A. a

     ✗ B. b

     ✗ C. c

     ✔ D. d

Question ID : **1703224850**
Status : **Answered**
Chosen Option : **B**

Q.48   What should be the wavelength of incident photon so that increase in wavelength of scattered

photon at a scattering angle of 90° is 1%. h=6.63x10^{-34} m^2 kg s^{-1}, m$_o$= 9.1x10^{-31}kg

(a) 2.43 Angstrom

(b) 4.43 Angstrom

(c) 5.43 Angstrom

(d) 3.23 Angstrom

Ans   ✔ A. a

   ✘ B. b

   ✘ C. c

   ✘ D. d

Question ID : **1703224847**
Status : **Answered**
Chosen Option : **A**

Q.49   Work done will be maximum if the angle between the force F and displacement d is

(a) 45°

(b) 90°

(c) 180°

(d) 0°

Ans   ✘ A. a

   ✘ B. b

   ✘ C. c

   ✔ D. d

Question ID : **1703224833**
Status : **Answered**
Chosen Option : **D**

Q.50   The relation between Fahrenheit (F) temperature scale to Celsius (C) temperature scale

     (a) F=9/5 C +32

     (b) F= 95 C+ 32

     (c) F= (9C+32) /5

     (d) F= 9C/5 +273

Ans   ✔ A. a

     ✘ B. b

     ✘ C. c

     ✘ D. d

Question ID : **1703224839**
Status : **Answered**
Chosen Option : **A**

Q.51   The performance characteristics of multimode graded index fibers are

     (a) Better than multimode step index fibers

     (b) Same as multimode step index fibers

     (c) Lesser than multimode step index fibers

     (d) Negligible

Ans   ✔ A. a

     ✘ B. b

     ✘ C. c

     ✘ D. d

Question ID : **1703224882**
Status : **Answered**
Chosen Option : **A**

Q.52

In a thermodynamic process the temperature of the system remains constant is known as

(a) Adiobatic process

(b) Isochronic Process

(c) Isobaric Process

(d) Isothermal Process

Ans   ✗ A. a

            ✗ B. b

            ✗ C. c

            ✓ D. d

Question ID : **1703224837**
Status : **Answered**
Chosen Option : **D**

Q.53

A modification of Bohr's model that assumes elliptical orbits is called:

(a) Dirac's model

(b) Fermi's model

(c) Einstein's model

(d) Sommerfeld's model

Ans   ✗ A. a

            ✗ B. b

            ✗ C. c

            ✓ D. d

Question ID : **1703224886**
Status : **Answered**
Chosen Option : **D**

Q.54 If a wheel of radius" r "turns through an angle of 30° then the distance through which any point

on its rim moves is

(a) π /3 x r

(b) π/6 x r

(c) V/30 x r

(d) π / 180 x r

Ans ✗ A. a

✓ B. b

✗ C. c

✗ D. d

Question ID : **1703224834**
Status : **Answered**
Chosen Option : **B**

Q.55 A train moving at a speed of 150 m/s comes to rest in 5 sec. Find its retardation.

(a) -60 m/s^2

(b) 20 m/s^2

(c) 30 m/s^2

(d) -15 m/s^2

Ans ✗ A. a

✗ B. b

✓ C. c

✗ D. d

Question ID : **1703224874**
Status : **Answered**
Chosen Option : **C**

Q.56   Which theory of physics quantifies the bending of light due to gravity?

(a) Newtonian gravity

(b) Quantum mechanics/Photon model

(c) General relativity

(d) Special relativity

Ans   ✗ A. a

✗ B. b

✓ C. c

✗ D. d

Question ID : **1703224883**
Status : **Answered**
Chosen Option : **C**

Q.57   Photoelectric effect can be effectively explained by.

(a)Classical Mechanics.

(b) Quantum theory of light.

(c)Wave theory of light.

(d) None of the above.

Ans   ✗ A. a

✓ B. b

✗ C. c

✗ D. d

Question ID : **1703224879**
Status : **Answered**
Chosen Option : **B**

Q.58   Planck's constant can be found by dividing energy of a photon by its

(a) Wavelength

(b) Frequency

(c) Amplitude

(d) None of the above

Ans   ✘ A. a

✔ B. b

✘ C. c

✘ D. d

Question ID : **1703224875**
Status : **Answered**
Chosen Option : **B**

Q.59   In Raman effect, the stokes lines are of _____ than that of exciting radiation

(a) Longer wavelength

(b) Shorter wavelength

(c) Same wavelength

(d) None of the above

Ans   ✔ A. a

✘ B. b

✘ C. c

✘ D. d

Question ID : **1703224855**
Status : **Answered**
Chosen Option : **A**

Q.60

One Calorie is equal to _____ Joule

(a) 8.148

(b) 4.184

(c) 41.84

(d) 9.81

Ans   ✗ A. a

✔ B. b

✗ C. c

✗ D. d

Question ID : **1703224838**

Status : **Answered**

Chosen Option : **B**