UNIT WISE MDCAT PHYSICS 2019

MUHAMMAD IRFAN QAYYUM
@SUCCESS PREACHER
BS CHEMISTRY (GCUF)

TEAM

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MEASUREMENT

1. The diameter of a wire is measured by using a micrometer screw gauge with a least count of 0.01mm, then which of the following reading will be correct?

(A) 0.067cm
(B) 0.0067mm
(C) 0.67cm
(D) 6.70cm

2. Percentage uncertainty in the length and width of rectangle is 2% and 3%. The total uncertainty in area of that rectangle is?

(A) 1.5%
(B) 5%
(C) 6%
(D) 1%

ANSWERS			
1	A	2	B

MOTION AND FORCE

1. For projectile motion in the absence of air resistance:

(A) vertical speed is constant
(b) horizontal force is constant
(c) horizontal acceleration is zero
(D) vertical acceleration is zero

2. The range of projectile depends upon the velocity of the projection and the angle of the projection i.e 45°. For a fixed velocity, when the angle of projection is larger than 45°. Which of following is correct?

(A) both the height and the range attained by the projectile will be less.
(B) both the height and the range attained by the projectile will be more.
(C) the height attained by the projectile will be less but the range is more.
(D) the height attained by the projectile will be more but the range is less.

3. If two objects of equal masses 'm' are moving towards each other with the same speeds 'v' then what will be the total final momentum after elastic head on collision?

(A) -mv kg/s
(B) mv kg m/s
(C) 2mv kg/s
(D) 0 kg m/s

ANSWERS					
1	C	2	D	3	D

WORK, ENERGY AND POWER

1. Which of following statement shows that no work is done?

(A) pushing a car to start it moving (B) writing an essay on page
(C) lifting the weights (D) the moon orbiting the earth

- 2. An automobile is moving forward with uniform velocity due to the force exerted by its engine. If that force is double with the velocity remaining constant what happens to its total power?

(A) it does not change (C) it is halved
(B) it is squared (D) it is doubled

ANSWERS			
1	D	2	D

CIRCULAR MOTION

1. Work done by the centripetal force for circular motion will be:

(A) reduced (B) maximum

(C) half (D) zero

2. An object is moving along a circular path of radius 4m. What will be its angular displacement if it moves 14m on this circular path?

(A) 5.5 radians (B) 3.5 radians

(C) 5.0 radians (D) 4.5 radians

ANSWERS			
1	D	2	B

OSCILLATION

1. When the length of the simple pendulum is doubled, then the ratio of its new time period to old time period is:

   (A) $2\sqrt{2}$ (B) $-\sqrt{2}$

   (C) $\sqrt{2}$ (D) $1/\sqrt{2}$

2. In simple harmonic motion, acceleration will be maximum, when object is at:

   (A) maximum displacement from the mean position

   (B) center position

   (C) mean position

   (D) half of the maximum displacement from the mean position

ANSWERS			
1	C	2	A

WAVES

1. The wavelength of the electromagnetic wave having frequency of 3kHz will be:

   (A) 80km (C) 100km

   (B) 140km (D) 120km

2. What will be the expression for the observed frequency, if the source is moving towards the observer?

   (A) $f_0 = \left(\frac{v}{v-U_S}\right) f$ (C) $f_0 = \left(\frac{v}{v+U_S}\right) f$

   (B) $f_0 = \left(\frac{v}{v \pm U_S}\right) f$ (D) $f = \left(\frac{v}{v \pm U_S}\right) f_0$

ANSWERS			
1	C	2	A

LIGHT

1. **In double slit experiment, the fringe spacing of the diffracted rays increases when:**
   (A) the distance between the slit and the screen decreases
   (B) the wavelength of the diffracted rays increases
   (C) the distance from the mid point of the slits to the central point of the fringe on the screen increases
   (D) the distance between the slits increases

2. **Path difference for the destructive interference can be written as:**
   (A) $\Delta s = n\lambda$
   (B) $\Delta s = \left(n + \frac{1}{3}\right)\lambda/2$
   (C) $\Delta s = 2n\lambda$
   (D) $\Delta s = (2n + 1)\lambda/2$

3. **If a light is emitted by a single source passes through two narrow slits 1.00mm apart. The interference pattern is observed on a screen 200 cm away and the separation between the centers of adjacent bright fringes is 2.00 mm. what would be the wavelength of the light?**
   (A) 2 μm
   (B) 1 μm
   (C) 2 pm
   (D) 1 nm

ANSWERS					
1	B	2	D	3	B

HEAT AND THERMODYNAMICS

1. Molecules of a gas at a constant pressure for a fixed amount of gas have average kinetic energy 'X'. On increasing temperature from 27℃ to 327 ℃, average K.E. of the molecules will become:
   (A) 200 X (C) 300 X
   (B) 20 X (D) 2 X
2. The sum of all forms of molecular energies (kinetic and potential) of a substance is termed as?
   (A) internal energy (C) heat energy
   (B) elastic energy (D) absolute energy

ANSWERS			
1	D	2	A

ELECTROSTATICS

1. Elastic field strength of a point charge is E and electric potential is V at a distance r from the point charge. What is the electric potential at a point for the same point charge where electric field strength is E/4?

   (A) V/4 (C) 4V

   (B) V/2 (D) 2V

2. Electric field strength at a point between oppositely charged plates is E. if the distance between plates is reduced to half, what will be the new value of electric intensity?

   (A) 4E (C) E/4

   (B) E/2 (D) 2E

ANSWERS			
1	A	2	D

CURRENT ELECTRICITY

1. Calculate the rate at which energy is transferred by 220V mains supply which provides a current of 0.1 A to a LED?
   (A) 22 kW (C) 22 W
   (B) 2.2 kW (D) 2.2 W

2. A copper wire has length L and cross sectional area A. Its resistance is R. if we halved the length and halved the diameter of the wire then what will be the resistance of this wire?
   (A) R (C) 2R
   (B) 3R (D) 4R

3. Kirchhoff's first rule corresponds to:
   (A) law of conservation of energy (C) law of conservation of momentum
   (B) law of conservation of charge (D) law of conservation of mass

ANSWERS					
1	C	2	C	3	B

ELECTROMAGNETISM

1. The unit of magnetic flux density is tesla 'T', it can also be expressed as:
   (A) 1 $N^{-1}\ A^{-1}$ m
   (B) 1 $N^{-1}\ A^{-1}\ m^{-1}$
   (C) 1 N A^{-1} m
   (D) 1 N $A^{-1}\ m^{-1}$

2. If a conductor of length 7m is placed in a magnetic field of strength 0.3T carrying current 1A, parallel to the field. What will be the force acting on it due to this magnetic field?
   (A) 2.1 N
   (B) 0 N
   (C) 3.1 N
   (D) 7 N

3. The horizontal component of earth magnetic flux density is 1.8 x 10^{-6} T. The current in a horizontal cable is 160A. Calculate the maximum force per unit length.
   (A) 2.88 x 10^{-4} N/m
   (B) 2.88 x 10^{-8} N/m
   (C) 2.88 x 10^{-2} N/m
   (D) 2.88 x 10^{-6} N/m

ANSWERS					
1	D	2	B	3	A

ELECTROMAGNETIC INDUCTION

1. An alternation voltage V (in volts) is represented by the equation:
   $V = 300 \sin(100\pi t)$
   what is the value of "f" for this voltage?
   (A) 25 Hz (C) 50 Hz
   (B) 200 Hz (D) 100 Hz

2. If we give a direct current to the transformer's primary coil, then there will be:
   (A) less EMF produced in secondary (C) equal EMF produced in secondary
   (B) No EMF produced in secondary (D) more EMF produced in secondary

3. If we change the magnetic flux linking a coil by rotating the coil in a constant magnetic field, the rate of change of this flux is:
   (A) proportional to the emf produced in it
   (B) proportional to the change in magnetic field
   (C) proportional to the resistance of the coil
   (D) proportional to the material of the coil

ANSWERS					
1	C	2	B	3	A

DEFORMATION OF SOLIDS

1. A wire has a spring constant of 5 x $10^4\ N/m$. It is stretched by a force to extension of 1.4 mm. Calculate the strain energy stored in the wire.
   (A) $4.9\ x\ 10^{-5}$ J
   (B) 4.9 J
   (C) $4.9\ x\ 10^{-5}$ J
   (D) $4.9\ x\ 10^{-2}$ J

2. The area under the extension load graph of an elastic material whose elastic limit has not been exceeded gives its:
   (A) stress
   (B) strain energy
   (C) young modulus
   (D) strain

ANSWERS			
1	D	2	B

ELECTRONICS

1. The direction of current through the load resistance of full wave rectification circuit:
   (A) inverts for negative cycle (C) inverts for positive cycle
   (B) changes for every cycle (D) remains constant
2. A negligible small current between input terminals of the operational amplifier is because of:
   (A) low input resistance (C) high output resistance
   (B) low output resistance (D) high input resistance

ANSWERS			
1	D	2	D

MODERN PHYSICS

1. Minimum energy required to eject an electron from metal surface is called:
   (A) work function
   (B) stopping potential
   (C) threshold frequency
   (D) electromotive force

2. The value and unit of Plank constant 'h' can be expressed as:
   (A) $6.63\ x\ 10^{-34}$ J/s
   (B) $6.63\ x\ 10^{-43}$ Js
   (C) $6.63\ x\ 10^{-34}$ Js
   (D) $3.63\ x\ 10^{-34}$ Js

3. Calculate the energy of a photon of frequency $3\ x\ 10^{18}$ Hz. (h= $6.63\ x\ 10^{-34}$)
   (A) $19.89\ x\ 10^{-18}$ J
   (B) $1.89\ x\ 10^{-16}$ J
   (C) $11.89\ x\ 10^{-16}$ J
   (D) $19.89\ x\ 10^{-16}$ J

4. A particle carrying a charge of 5e falls through a potential difference of 25V. What would be energy acquired by the particle in 'J'.
   (A) $125\ x\ 10^{-19}$ J
   (B) $1.6\ x\ 10^{-19}$ J
   (C) $125\ x\ 1.6\ x\ 10^{-19}$ J
   (D) 125 J

ANSWERS							
1	A	2	C	3	D	4	C

NUCLEAR PHYSICS

1. **Heavy nucleus of atom go through fission so that they can:**
   (A) absorb high amount of energy
   (B) absorb low amount of energy
   (C) increase their binding energy per nucleon
   (D) reduce their binding energy per nucleon

2. **What is the quark composition of a proton?**
   (A) 2 up quark and 1 down quark
   (B) 1 up quark and 2 strange quarks
   (C) 2 up quark and 1 strange quark
   (D) 2 down quarks and 1 up quark

3. **In relation $\lambda T_{1/2} = 0.693$, which quantity is represented by λ?**
   (A) half life
   (B) wavelength
   (C) activity
   (D) decay constant

ANSWERS					
1	C	2	A	3	D