3 marker questions

1. A hot liquid is kept a ‘big room’. The logarithm of the numerical value of the temperature difference between the liquid and the room is plotted against time. The shape of the plot will be very nearly?

Answer: straight

1. On a new scale of temperature (which is linear) and called the W scale, the freezing and boiling point of water are 390 W and 2390 W respectively. What will be the temperature on the new scale, corresponding to a temperature of 390 C on the Celsius scale?
   1. ANSWER: 1170 W
2. The mesmerizing view from the top floor of the empire state building left you speechless and then you notice an experiment being conducted by two students. A person A throws a ball from the top of Empire State, at a height of 400m from the ground, another person B throws a ball at the same time in the air at a speed of 100 m/sec. Find the distance covered by ball B after it crosses ball A. (assume g=10 m/sec2).

ANSWER: 480 m

1. You had some free time and you planned to visit a nearby water park. There you observed a system of pipes of circular cross section:

A pipe A has a discharge of 50 m3/s. It is divided into two parts B and C, B has a velocity of10 m/s and diameter of 1 m. C is further divided in to D and E. And finally E and B meets giving a final discharge of 40 m3/s.Find the discharge in D. Neglect friction and other losses and round off the answer to the nearest whole number

ANSWER : 9 or 10 or 11

1. A particle moves in a region having a uniform magnetic field and a parallel uniform electric field. At some instant, the velocity of the particle is perpendicular to the field direction. The path of the particle will be ?

ANSWER: a circle

1. Displacement current goes on through the gap between the plates of the capacitor when the charge in the capacitor\_\_\_\_\_\_\_\_

ANSWER: is zero

1. A point source of light is used in a photoelectric effect. If the source is received farther from the emitting metal .What effect it will have on the stopping potential?

ANSWER: will remain constant.

1. A car is running at a speed u. Seeing a child on the road, the driver applies brakes so as to bring the car to halt within a distance S. What is the reaction time of the driver?

ANSWER: 2S/u

1. A mass of 0.5 kg moving with a speed of 1.5 m/s on a horizontal smooth surface collides with a nearly weightless spring of force constant k= 50N/m. what would be the maximum compression of the spring?

ANSWER: 0.15m

1. A spherical drop of water carrying a charge of 3.0x10-10 has a potential of 500V at its surface. If two such drops combine to form a single drop, what is the potential at the surface of the new drop so formed?

ANSWER: 795V

1. Newton solved the apple earth problem by stating the.

Answer: shell theorem

1. A boy whirl a stone in a horizontal circle of radius 1.5m and at a height 2m above the level ground. The string breaks and the stone flies off tangentially and strikes the ground after travelling a horizontal distance of 10m. What is the magnitude of the centripetal acceleration of the stone while in circular motion?

ANSWER: 163m/s2

1. If heat is supplied to a body ,its temperature
2. Must increase c) may increase
3. May remain constant d) may decrease

ANSWER: b and c

1. A rigid container of negligible heat capacity contains one mole of an ideal gas. The temperature of the gas increase by 10C if 3.0 cal of hear is added to it. The gas may be
2. Helium
3. Argon
4. Oxygen
5. Carbon dioxide

ANSWER : a and b

1. When no current is passed through a conductor
2. The free electrons do not move
3. The average speed of a free electron over a large period of time is zero
4. The average velocity of a free electron over a large period of time is zero
5. The average of the velocities of all the free electrons at an instant is zero

ANSWER: c and d

1. Two identical metallic spheres are given charges +q and –q respectively. Now,
2. Both the spheres have equal masses
3. The positively charged sphere has a mass smaller than the negatively charged sphere
4. The negatively charged sphere has a mass smaller than the positively charged sphere
5. The change in their masses depend upon the magnitude of q.

ANSWER: b and d

1. Two cubes each weighing 22g exactly are taken. One is of iron ( d= 8x103 kg/m3)) and other is of marble (d= 38x103 kg/m3). They are immersed in alcohol and then weighed again
2. Iron cube weighs less
3. Iron cube weighs more
4. Both have equal weight
5. Nothing can be said

Answer: b

1. Which of the following statement(s) is/are incorrect:

Statement a: Reversible isothermal compression of an ideal gas represents the limiting min value of the work done (|w|) by the surrounding of the system.

Statement b: In an irreversible process, the cyclic integral of work is not zero.

Statement c: For thermodynamic changes in adiabatic process. T(C,m)/RP=constant

Statement d: Ssystem is zero for reversible adiabatic expansion for an ideal gas

Codes:

1. Statement c B) Statement a,b,c C)Statement a,b,d D)all

Ans:A

1. Choose the wrong statements
2. The molecules of the liquid lying in the surface film have smaller potential energy in comparison to the inner molecules.
3. For a curved surface of a liquid in equilibrium, the pressure is more on the concave side of the liquid than on the convex side.
4. Excess pressure inside the air bubble of radius R at the depth h inside a liquid of surface tension S is p=h*p*g+ 2*S/R*
5. Angle of contact increases with the increase in temperature of liquid.
6. Angle of contact depends on the inclination of the solid surface to the liquid surface.

Ans: a,c,e

1. Choose the wrong statements
2. Temperature of a body determines, the heat contents of the body
3. The separation marks on the thermometer for freezing point of ice and boiling point of water are equal for centigrade temperature and absolute temperature scale.
4. The density of a solid changes with the rise in temperature dT by the relation

*P’*=*p*(1+*y*dT)

where *p* and *p’* is the initial and the final density of the solid and *y is the* coefficient of volume expansion of the solid.

1. Specific heat of water always increases with rise in temperature upto boiling point of water.

Ans: a,c,d