NET, IAS, State-SET (KSET, WBSET, MPSET, etc.), GATE, CUET, Olympiads etc.: Physics MCQs (Practice_Test 31 of 35)

1. The logic operation to be performed to obtain the given truth table is
   a. Exclusive OR TRUTH TABLE
   b. OR a b y
   c. NOR 0 0 1
   d. Exclusive NOR 0 1 $\frac{0}{1}$ 0 $\frac{0}{1}$ 1 1
2. Consider the following steps/parameters
   a. Choice of device, valve or transistor.
   b. Choice of load circuit.
   c. DC-Q point.
   d. AC input amplitude.
   - Their correct sequence (given the specifications of output frequency and output voltage or power) , while designing an amplifier will be
     a. 1,3, 2,4
     b. 1,2, 3,4
     c. 3,2, 1,4
     d. 3,1, 4,2
3. Which of the following are essential for maintaining oscillations in an oscillator?
   a. Positive feedback.
   b. Design of load (turned or phase shifting network) .
   c. Non-linear biasing circuit.
   d. High gain amplifier.
   - Select the correct answer from the codes given below
     a. 1,2, 3 and 4
     b. 1 and 4
     c. 2,3 and 4
     d. 1,2 and 3

4. - **Assertion (A)** : The shape of a liquid drop is spherical.
   - **Reason (R)** : The pressure inside the drop is greater than that outside:
     a. Both A and R are true and R is the correct explanation of A
     b. Both A and R are true but R is not the correct explanation of A
     c. A is true but R is false
     d. A is false but R is true
   - **Assertion (A)** : A half-wave gypsum is made from clear gypsum to produce a path difference of 550 n.
   - **Reason (R)** : When gypsum is placed between crossed polarizes, 550 nm will not pass through the analyzer and the transmitted light will be red.
     a. Both A and R are true and R is the correct explanation of A
     b. Both A and R are true but R is not the correct explanation of A
     c. A is true but R is false
     d. A is false but R is true
5. - **Assertion (A)** : The mean energy per resonator of room temperature T is given by (symbols have the usual meaning) .
   - **Reason (R)** : This is a direct consequence of Planck's quantum hypothesis.
     a. Both A and R are true and R is the correct explanation of A
     b. Both A and R are true but R is not the correct explanation of A
     c. A is true but R is false
     d. A is false but R is true
   - **Assertion (A)** : At cryogenic temperature, the electrical resistivity in metallic conductors diminishes.
   - **Reason (R)** : Thermal oscillations of atoms which hinder motion of free electrons under the influence of an external electric field become insignificant.
     a. Both A and R are true and R is the correct explanation of A
     b. Both A and R are true but R is not the correct explanation of A
     c. A is true but R is false
     d. A is false but R is true
6. - **Assertion (A)** : In all conductors, for studying the thermoelectric behavior of metals, lead is taken as the standard metal.
   - **Reason (R)** : In lead, the Thomson effect is negative.
     a. Both A and R are true and R is the correct explanation of A
     b. Both A and R are true but R is not the correct explanation of A
     c. A is true but R is false
     d. A is false but R is true

- **Assertion (A)** : In a tangent galvanometer, the suspended magnet is made as small as possible.
- **Reason (R)** : The needle being at the centre of the coil, the deflections are uniform.
  a. Both A and R are true and R is the correct explanation of A
  b. Both A and R are true but R is not the correct explanation of A
  c. A is true but R is false
  d. A is false but R is true

7.
- **Assertion (A)** : An electron microscope can achieve better resolving power than an optical microscope.
- **Reason (R)** : The deBroglie wavelength of the electrons emitted from an electron gun is much less than 500 nm.
  a. Both A and R are true and R is the correct explanation of A
  b. Both A and R are true but R is not the correct explanation of A
  c. A is true but R is false
  d. A is false but R is true
- **Assertion (A)** : Light nuclei having equal number of protons and neutrons are more stable.
- **Reason (R)** : In heavy nuclei, there is an excess of neutrons due to Coulomb repulsion between protons.
  a. Both A and R are true and R is the correct explanation of A
  b. Both A and R are true but R is not the correct explanation of A
  c. A is true but R is false
  d. A is false but R is true

8.
- **Assertion (A)** : In electronic valves, current from the thermion emitter truly never saturates even in the temperature limited region.
- **Reason (R)** : Applied electrostatic field on the anode lowers the work function of the emitter.
  a. Both A and R are true and R is the correct explanation of A
  b. Both A and R are true but R is not the correct explanation of A
  c. A is true but R is false
  d. A is false but R is true
- **Assertion (A)** : At a fixed temperature, silicon will have a minimum conductivity when it has a smaller acceptor doping.
- **Reason (R)** : The conductivity of an intrinsic semiconductor is slightly higher than that of a tightly doped p-type.
  a. Both A and R are true and R is the correct explanation of A

b. Both A and R are true but R is not the correct explanation of A

c. A is true but R is false

d. A is false but R is true

9. The following processes are used for cooling

a. Adiabatic expansion

b. Adiabatic demagnetization

c. Joule-Thomson effect

d. Evaporation

- The correct sequence of these processes in order of their ability to produce lower and lower temperature is

a. 4,1, 2,3

b. 4,1, 3,2

c. 1,4, 2,3

d. 1,4, 3,2

10. If the number of degrees of freedom of a molecule in a gas is 'n' then the ratio of specific heats is given by

a. 1 + 1/n

b. $1 + \frac{1}{2}$ n

c. 1 + 2/n

d. 2n/2 n − 1

11. The ratio: Slope of isothermal curve is equal to Slope of adiabatic curve

a. 1

b. g

c. 1/g

d. 2

12. The relative humidity in a room is 5% at 15 C. What will be the relative humidity if the temperature increased by 10 C (SVP at 15 C = 12.38 mm of Hg SVP at 25 C = 24.76 mm of Hg) ?

a. 1.25%

b. 2.5%

c. 5%

d. 10%

13. One mole of a perfect gas expands adiabatic ally. As a result of this, its pressure, temperature and volume change from P1, T1, V1 to P2, T2 and V2 respectively. If molar specific heat at constant volume is Cv, then the work done by the gas is

a. 2.303 P1V1 log (V2/V1)

b. RT l log (V2/V1)

c. P12 V12 – P22 V22/R (T2 – T1)

d. Cv (T1 – T2)