BRAINWARE UNIVERSITY

Term End Examination 2023

Programme – Dip.CSE-2018/Dip.CSE-2019/Dip.CSE-2020/Dip.CSE-2021

Course Name – Physics II

Course Code - DCSE202

(Semester II)

Full Marks : 60 **Time : 2:30 Hours**

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A

(Multiple Choice Type Question) 1 x 15=15

1. *Choose the correct alternative from the following :*

(i) The resistance of two lamps is in the ratio 4:5. Their power will be in the ratio

a) 4:5 b) 5:4
c) 16:25 d) 25:16

(ii) In a Wheatsone bridge if battery and galvanometer are interchanged then deflection in galvanometer will

a) not change. b) change.
c) change in opposite direction. d) change in same direction.

(iii) Calculate the time required to perform $520\ J$ of work to produce power of $20\ W$?

a) $24s$ b) $16s$
c) $20s$ d) $26s$

(iv) Weber can also be expressed as

a) tesla b) tesa m^2
c) tesla / m d) $tesla^2$

(v) Bridge rectifier for full wave rectification needs

a) four diodes b) two diodes
c) no diodes d) three diodes

(vi) At a particular instant, acceleration of a body is called _____.

a) instantaneous acceleration b) instantaneous velocity
c) instantaneous displacement d) instantaneous speed

(vii) In normal population, the number of atoms in the _____ .

a) excited state is more than the ground state b) ground state is more than the excited state
c) excited state is equal to the ground state d) ground state is zero

(viii) Induced emf is independent of

a) change of flux. b) resistance of coil.
c) time. d) number of turns in the coil.

(ix) A heavy truck has more momentum than a passenger car moving at the same speed because the truck _____.

a) has greater mass
b) has greater speed
c) is not streamlined
d) has a large wheelbase

(x) Identify the correct relation.

a) v=u+at
b) a=v+ut
c) u=a-vt
d) a=v-ut

(xi) The moment of inertia of a circular disk is _____.

a) $2/3\ MR^2$
b) MR^2
c) $1/2\ MR^2$
d) 0

(xii) The energy possessed by a body due to its position is called _____.

a) kinetic energy
b) potential energy
c) mechanical energy
d) electrical energy

(xiii) "Sum of all currents meeting at a point is zero", stated law is

a) Kirchhoff's first law
b) Kirchhoff's second law
c) Kirchhoff's third law
d) Kirchhoff's fourth law

(xiv) Identify the physical quantity having unit Joule.

a) Work
b) Power
c) Momentum
d) Velocity

(xv) The SI unit of self-inductance is

a) Gauss
b) Henry
c) Tesla
d) None of these

Group-B
(Short Answer Type Questions) 3 x 5=15

2. Write the similarities and differences between speed and velocity. (3)

3. Determine the equivalent resistance when three resistances 2 ohm, 4 ohm and 6 ohm are connected in (a) series and (b) parallel. (3)

4. State Biot-Savart's law related to the production of magnetic field due to a small element of current. (3)

5. Deduce the relation between HP and Watt. (3)

6. State the properties of X-ray. (3)

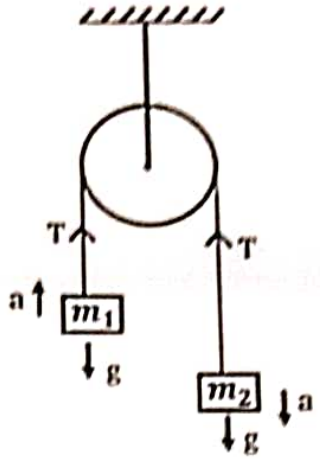
OR

What do you mean by intrinsic and extrinsic semiconductors? Give example. (3)

Group-C
(Long Answer Type Questions) 5 x 6=30

7. Show that the sum of potential energy and kinetic energy of a body falling freely from a certain height is always constant. (5)

8. Two masses m_1 and m_2 ($m_2 > m_1$) are tied at the ends of an inextensible string of tension T. The string passes over a light and frictionless pulley as shown in fig.1 below. Mass m_1 moves upward with acceleration a and mass m_2 moves downward with the same acceleration. Find expressions of a and T in terms of m_1 and m_2. (5)



9. By mistake, a voltmeter is connected in series and an ammeter is connected in parallel with a resistance in an electrical circuit. Explain what will happen ? (5)

10. Write short note on motion of lift. (5)

11. What do you mean by positive work? Explain briefly. (5)

12. Write the I-V relation for p-n junction diode explaining the significance of the symbol. Express the equation in graph for forward and reverse biasing. (5)

OR

Give examples of impurities used to prepare p-type and n-type semiconductor. Describe the formation of p-n junction diode. Explain the principle to use p-n diode as half-wave rectifier. (5)

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