

Exercise: Chapter 1

Answer ALL questions. (15 Marks)

1. Quantities that can be expressed in terms of basic quantities are called
  - (a) derived quantities
  - (b) physical quantities
  - (c) base quantities
  - (d) none of above
  
2. If gravitational force,  $F$  is given as  $= G \frac{m_1 m_2}{r^2}$ , where  $m$  is mass,  $r$  is radius and  $G$  is gravitational constant, what is the dimensional formula for  $G$ ?
  - (a)  $ML^2T^{-2}$
  - (b)  $M^{-1}L^3T^{-2}$
  - (c)  $ML^{-1}T^{-1}$
  - (d) None of the above
  
3. The displacement of a particle varies with time,  $t$  as  $s = at^2 - bt^3$ . The acceleration of the particle is zero at time is equal to:
  - (a)  $a/b$
  - (b)  $a/3b$
  - (c)  $3b/a$
  - (d)  $2a/3b$
  
4. The mass of planet X is  $5.64 \times 10^{26}$  kg and its radius is  $6.00 \times 10^{27}$  m. Find its density in gram per cubic centimeter.

[6 Marks]

5. The volume of a substance represented in a function of time is calculated as  $V = At^3 + B/t^3$ , where time,  $t$  measures in seconds and volume,  $V$  is in cubic meters. Determine the dimensions constants and SI units of the constants  $A$  and  $B$ .

[6 Marks]

ANSWER:

1. B
2. B
3. C
4.  $0.623 \text{ g/cm}^3$
5.  $\text{m}^3\text{s}$