

# Physics English Classified MCQ Measurements 1990 - 2016

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# Measurements

## 01. Unit and dimensions

- 1) Work has the same dimension as,  
(1) energy (2) force (3) momentum (4) power (5) impulse  
(1991)
- 2) A light - year is equivalent to (the velocity of light =  $3 \times 10^8 \text{ ms}^{-1}$ )  
(1)  $3 \times 10^8 \times 365 \times 24 \times 3.6 \text{ km}$  (3)  $3 \times 10^8 \times 365 \times 3.6 \text{ km}$   
(2)  $3 \times 10^8 \times 365 \times 24 \times 3.600 \text{ km}$  (4)  $365 \times 24 \times 3.6 \text{ s}$   
(5)  $365 \times 24 \times 3600 \text{ s}$  (1991)
- 3) Which one of the following quantities is calculated by multiplying force by time?  
(1) Acceleration (2) momentum (3) velocity (4) kinetic energy (5) Power  
(1993)
- 4) The distance S traveled by a vehicle during time t is given by the equation  $S = AT^2 (1 + \frac{1}{2} Bt)$  The dimensions A and B are respectively.  
(1)  $LT^{-2}; L^{\frac{1}{2}} t^{\frac{3}{2}}$  (2)  $T^2; T^3$  (3)  $LT^{-2}; T^{-1}$   
(4)  $LT^{-2}; (LT^{-3})^{\frac{1}{2}}$  (5) L ; L (1993)
- 5) Which one of the following pairs contains one vector quantity and one scalar quantity?  
(1) displacement, acceleration (2) power, speed (3) work, potential energy  
(4) force, kinetic energy (5) momentum, velocity (1994)
- 6) Which of the following can be measured in joules?  
(A) Work done by a force ✓  
(B) Gravitational potential energy ✓  
(C) Moment of a force  
(1) A only (2) A and B only (3) B and C only  
(4) A and C only (5) all A, B, and C (1994)
- 7) Consider the following quantities used in physics,  
(A) Electric charge (B) Mass (C) Temperature  
Which of the above is/are base quantity /quantities of the international system of Units (SI) ?  
(1) B only (2) A and B only (3) A and C only  
(4) B and C only (5) all A, B and C (1996)
- 8) Which one of the following is a unit of momentum?  
(1)  $\text{Ns}^{-2}$  (2)  $\text{Ns}^{-1}$  (3) Ns (4)  $\text{Ns}^2$  (5)  $\text{N}^2\text{s}$  (1997)
- 9) If a, V and t in the following equation represent a force, an acceleration, a velocity and a time respectively.  $F = c_1 a + c_2 \frac{V}{t}$   
The ratio  $\frac{c_1}{c_2}$ ,  
(1) has the dimensions of acceleration (2) has the dimensions of mass  
(3) has the dimensions of work (4) has the dimensions of velocity  
(5) is dimensionless (1998)



- 10) One of the following units measures a physical quantity that is different from the physical quantity measured by the others. This is,  
 (1) eV (2)  $\text{Js}^{-1}$  (3) Ws (4) kW hours (5) MeV (2000)
- 11) eV (electron-volt) is a unit of,  
 (1) Power (2) energy (3) charge (4) voltage (5) potential difference (2001)
- 12) In the following expression  $I$  and  $V$  represent current and voltage respectively.  $C$  is a constant.  

$$C \log \left( \frac{I}{I_0} + 1 \right) = \frac{qV}{kT}$$
 The term  $\frac{kT}{q}$  has  
 (1) no dimensions (2) dimensions of resistance. (3) dimensions of  $\text{V}^{-1}$   
 (4) dimensions of  $I$  (5) dimensions of  $V$  (2004)
- 13) The variation of rate of decay ( $A$ ) of a radioactive sample with time ( $t$ ) is given by the relationship  $A = A_0 e^{-\lambda t}$ . The dimension of  $\lambda$  is,  
 1) T (2)  $\text{T}^{-1}$  (3) MT (4)  $\text{M}^{-1}\text{T}$  (5)  $\text{MT}^{-1}$  (2005)
- 14) In the equation  $C = \sqrt{\frac{k}{\rho}}$ ,  $C$  is speed and  $\rho$  is density. The units of  $k$  are,  
 1)  $\text{kg ms}^{-2}$  (2)  $\text{kg}^{1/2} \text{s}$  (3)  $\text{kg ms}^{-1}$  (4)  $\text{kg m}^{-1} \text{s}^{-2}$  (5)  $\text{kg m}^{1/2} \text{s}$  (2005)
- 15) Which of the following is not an SI unit?  
 1) kg (2) m (3) s (4) A (5) k (2006)
- 16) Dimension of a certain physical quantity when multiplied by  $[\text{L}]^3$  yield the dimension of work. The physical quantity would be,  
 1) force (2) momentum (3) pressure (4) mass (5) velocity. (2007)
- 17) Dimension of kilowatt – hour is,  
 1)  $[\text{M}][\text{L}]^2[\text{T}]^{-2}$  (2)  $[\text{M}][\text{L}][\text{T}]^{-1}$  (3)  $[\text{M}][\text{L}]^2[\text{T}]^{-3}$  (4)  $[\text{T}]$  (5)  $[\text{T}]^{-1}$  (2008)
- 18) Energy  $E$  of a photon of frequency  $f$  is given by  $E = hf$ . The dimensions of  $h$  are,  
 1)  $\text{ML}^2\text{T}^{-1}$  (2)  $\text{ML}^{-1}\text{T}^{-2}$  (3)  $\text{ML}^{-2}\text{T}^{-1}$  (4)  $\text{ML}^2\text{T}^{-2}$  (5)  $\text{ML}^{-3}\text{T}^{-1}$  (2009)
- 19) SI unit of the quantity of heat is,  
 1) cal (2) W (3) K (4) J (5) cd (2010)
- 20) Which of the following does not represent a fundamental unit in the SI system?  
 1) m (2) N (3) kg (4) s (5) K (2012)



- 21) Consider the following statements made about the information that can be obtained from the dimensional analysis.
- A) Numerical values of constants of proportionality that may appear in a physical equation can be determined by dimensional analysis.
  - B) Numerical signs of constant of proportionality that may appear in a physical equation can be determined by dimensional analysis.
  - C) The units of constants of proportionality that may appear in a physical equation can be determined by dimensional analysis

Of the above statements

- 1) only A is true
  - 2) only B is true
  - 3) only C is true
  - 4) only B and C is true
  - 5) all A, B and C are true.
- (2012)

- 22) SI unit of Planck constant is
- 1)  $\text{Js}^{-1}$
  - 2)  $\text{Js}$
  - 3)  $\text{JK}^{-1}$
  - 4)  $\text{JK}$
  - 5)  $\text{J}^{-1}\text{s}^{-1}$
- (2013)

- 23) As far as the units are concerned, which of the following quantities differs from the rest?

- 1) Rotational kinetic energy
  - 2) Mechanical potential energy
  - 3) Internal energy
  - 4) Work
  - 5) Power
- (2014)

- 24) Which of the following quantities is/are dimensionless?

- A) Relative velocity
  - B) Relative density
  - C) Relative humidity
  - 1) A only
  - 2) A and B only
  - 3) B and C only
  - 4) A and C only
  - 5) A, B and C
- (2014)

- 25) Electron volt (eV) is a unit of

- (1) charge
  - (2) potential
  - (3) capacitance
  - (4) energy
  - (5) electric field intensity
- (2015)

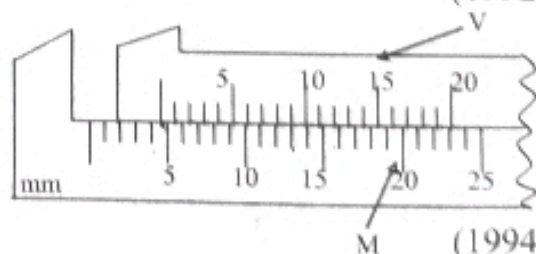
## 02. measuring instruments

- 1) Which of the following is not a measurement obtained using one of the laboratory measuring instruments,

- (1) 3.015 cm
  - (2) 10.122 cm
  - (3) 45.73 cm
  - (4) 72.1 cm
  - (5) 0.027 cm
- (1992)

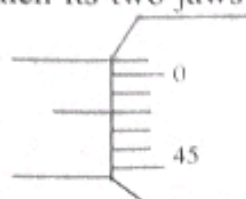
- 2) Figure shows the main scale, M, and the vernier scale, V of a measuring

- (1) 0.05 m
- (2) 0.10 mm
- (3) 1.15 mm
- (4) 0.20 mm
- (5) 0.25 mm



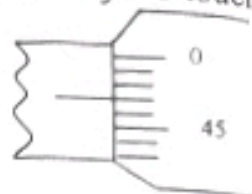
- 3) The figure shows a part of a micrometer screw gauge at a time when its two jaws are in contact. The zero error of the instrument is,

- (1) 0.48 mm and it must be added to the final scale reading
- (2) 0.48 mm and it must be subtracted from the final scale reading
- (3) 0.02 mm and it must be added to the final scale reading
- (4) 0.02 mm and it must be subtracted from the final scale reading
- (5) 0.03 mm and it must be added to the final scale reading



(1996)

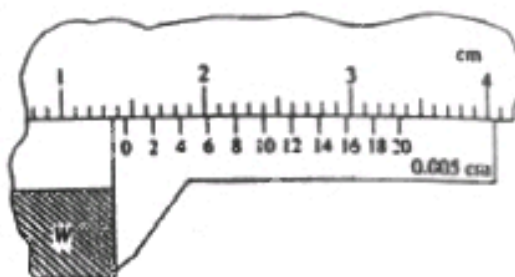
- 4) The figure shows a part of a micrometer screw gauge. When the two jaws touch each other. The zero error of the gauge is,
- (1) 0.43 mm and it should be added to the scale reading  
 (2) 0.43 mm and it should be subtracted from scale reading  
 (3) 0.03 mm and it should be added to the scale reading  
 (4) 0.03 mm and it should be subtracted from scale reading  
 (5) 0.47 mm and it should be subtracted from the scale reading (2000)



- 5) If  $(n - 1)$  number of main scale divisions of a certain measuring instrument is divided into  $n$  vernier scale divisions, then the least count of the instrument in main scale division is,

- 1) 1      2)  $\frac{1}{n}$       3)  $\frac{n}{n-1}$       4)  $\frac{n-1}{n}$       5)  $\frac{1}{n-1}$  (2006)

- 6) The length of a rectangular wooden block (W) is measured using vernier callipers. The figure shows the relevant sections of the vernier callipers and the block. (Only relevant divisions in the vernier scale are shown). If there is no zero error in the vernier callipers, then the length of the wooden block is,



- 1) 1.30 cm      2) 1.35 cm      3) 1.45 cm  
 4) 1.50 cm      5) 1.55 cm

(2009)

- 7) The most suitable measuring instrument to measure the external diameter of a soft rubber tube having its value of the order of 1 cm is,
- 1) meter ruler      2) vernier callipers      3) spherometer  
 4) micrometer screw gauge      5) travelling microscope (2011)

- 8) The following measurements A, B and C have been taken using correctly selected measuring instruments.

$$A = 3.1 \text{ cm} \quad B = 4.23 \text{ cm} \quad C = 0.354 \text{ cm}$$

Instruments used for the measurements A, B and C are

	A	B	C
(1)	Vernier calliper	Vernier calliper	Micrometer screw gauge
(2)	Metre ruler	Metre ruler	Vernier calliper
(3)	Metre ruler	Micrometer screw gauge	Travelling microscope
(4)	Metre ruler	Vernier calliper	Micrometer screw gauge
(5)	Vernier calliper	Metre ruler	Travelling microscope

(2015)

- 9) The percentage error of a certain length measurement has to be kept below 1%. If the error due to the measuring instrument is 1 mm, the measuring length has to be greater than,
- 1) 1 mm      2) 1 cm      3) 10 cm      4) 1 m      5) 10 m (2016)

## ANSWERS

### MEASUREMENTS

#### 01) Unit and Dimensions

(01)	4	(02)	1	(03)	3	(04)	3	(05)	4	(06)	2
(07)	4	(08)	3	(09)	5	(10)	2	(11)	2	(12)	5
(13)	2	(14)	4	(15)	5	(16)	3	(17)	1	(18)	1
(19)	4	(20)	2	(21)	3	(22)	2	(23)	1	(24)	3
(25)	4										

#### 02) Measurement instruments

(01)	3	(02)	1	(03)	3	(04)	3	(05)	2	(06)	3
(07)	5	(08)	4	(09)	3						

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