Yakeen NEET 2.0 2026

MahaManthan ASSIGNMENT
Units and Measurements

Assignment-01
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1. In SI unit system, electric current and thermodynamic temperature are base quantities. **True/False**

2. Hectare is a unit of length. **True/False**

3. Parallax method is used for measuring distance of stars from the earth. **True/False**

4. 1 astronomical unit is the average distance of the sun from the earth. **True/False**

5. Unified atomic mass unit is used for expressing mass of atom and molecules **True/False**

6. The result of every measurement by any measuring instrument does not contain any uncertainty. **True/False**

7. Every calculated quantity which is based on measured values, also has an error. **True/False**

8. The accuracy of a measurement is a measure of how close the measured value is to the true value of the quantity. **True/False**

9. Instrumental error is the source of random error. **True/False**

10. Error due to parallax is the source of systematic error. **True/False**

11. Mean absolute error may be positive or negative. **True/False**

12. When two quantities are multiplied or divided, the maximum absolute error in the final result is the sum of the absolute errors in the individual quantities. **True/False**

13. Number of significant figures depend on the least count of the measuring instrument. **True/False**

14. 5 is uncertain digit in number 2.765. If 2.765 is rounded off to three significant figures it becomes 2.77. **True/False**

15. Intermediate results in a multistep computation should be calculated to one more significant figure in every measurement than the number of digits in the least precise measurement **True/False**

16. In a formula of circumference of circle $S = 2\pi r$ (r = radius), 2 has infinite number of significant digits. **True/False**

17. In a measurement, the length 2.308 cm has four significant figures. But in different unit same length 0.02308 m has five significant figures. **True/False**

18. In a measurement, the length 20.500 has three significant figures. **True/False**

19. The diameter of the earth (1.28×10^7 m) is of order 10^7 m with the order of magnitude 7. **True/False**

20. The relative density of lead is 11.3. Its density is 11300 g/cm^3. **True/False**

21. The dimensional formula of impulse is the same as that of momentum. **True/False**

22. Planck's constant has the same dimensions as angular momentum. **True/False**

23. The unit of electric field in SI is $kg \cdot m \cdot s^{-3} \cdot A^{-1}$. **True/False**

24. Pressure and energy have the same dimensions. **True/False**

25. A quantity having the same unit in all systems of units must be dimensionless. **True/False**

26. If two physical quantities have the same dimensions, they must represent the same physical concept. **True/False**

27. The dimensional formula of surface tension is $M.T^{-2}$. **True/False**

28. The unit of coefficient of viscosity in CGS is dyne·s/cm^2. **True/False**

29. The physical quantity represented by the dimensions $[M^1L^{-1}T^{-2}]$ is pressure. **True/False**

30. The ratio of any two similar physical quantities is dimensionless. **True/False**

31. Torque and work have the same dimensions but are not the same physical quantities. **True/False**

32. The dimensional formula of the universal gravitational constant G is $[M^{-1}L^3T^{-2}]$. **True/False**

33. In dimensional analysis, trigonometric functions like sin θ must have dimensionless arguments. **True/False**

34. A change in the unit of length alone affects the numerical value of a derived quantity like speed. **True/False**

35. The product of force and displacement is dimensionally equal to power. **True/False**

36. Permittivity of free space has the SI unit of $C^2/N.m^2$. **True/False**

37. The quantity e^x, where x is a physical quantity with dimensions, is dimensionally consistent. **True/False**

38. The SI unit of magnetic flux is volt.second. **True/False**

39. Dimensional analysis can be used to derive vector equations. **True/False**

40. Dimensions of a physical quantity depend on the choice of the unit system. **True/False**

41. If two quantities have the same dimensions, they can be added or subtracted. **True/False**

42. The dimensions of velocity and acceleration are different, though both involve time. **True/False**

43. Energy and torque have the same dimensions. **True/False**

44. Angular momentum has dimensions of $[M^1L^2T^{-1}]$. **True/False**

45. The dimensional formula of capacitance is $[M^{-1}L^{-2}T^4A^2]$. **True/False**

46. All dimensionless quantities are also unitless. **True/False**

47. The physical quantity with dimensions $[M^0L^1T^0]$ is always length. **True/False**

48. A dimensionally correct equation is always physically correct. **True/False**

49. Poise is the CGS unit of dynamic viscosity and has dimensions of $[M^1L^{-1}T^{-1}]$. **True/False**

50. The dimensional formula of power is $[M^1L^2T^{-3}]$. **True/False**

51. Permittivity and permeability have different dimensional formulas. **True/False**

52. The dimension of strain is the same as that of angle (dimensionless). **True/False**

53. Logarithmic functions like ln(x) are only defined when x is dimensionless. **True/False**

54. The frequency of oscillation has dimensions of $[T^1]$. **True/False**

55. Planck's constant can be derived from the product of energy and frequency. **True/False**

56. Dimensions of physical constants like G, h, and c can be derived from basic definitions. **True/False**

57. The dimensions of pressure are $[M^1L^{-1}T^{-2}]$. **True/False**

58. A physical quantity with no dimensions can never have units. **True/False**

59. The dimensional analysis method fails when exponential or trigonometric functions are involved with dimensional arguments. **True/False**

60. The least count of a vernier caliper is the difference between one main scale division and one vernier scale division. **True/False**

61. Zero error occurs when the zero of the vernier scale does not coincide with the zero of the main scale when jaws are closed. **True/False**

62. A negative zero error is subtracted from the final reading. **True/False**

63. Vernier caliper can measure internal, external, and depth measurements. **True/False**

64. If 10 vernier scale divisions coincide with 9 main scale divisions, and 1 MSD = 1 mm, the least count is 0.1 mm. **True/False**

65. A spherometer is used to measure the radius of curvature of a spherical surface. **True/False**

66. A spherometer can be used to measure the thickness of a glass plate. **True/False**

67. The least count of a spherometer depends only on the number of circular scale divisions. **True/False**

68. Absolute error is the difference between measured value and true value, irrespective of sign. **True/False**

69. The percentage error can never be negative. **True/False**

70. When two quantities are added, their relative errors add. **True/False**

71. When quantities are multiplied, relative errors are added. **True/False**

72. Zero error is a type of systematic error. **True/False**

73. Random errors cannot be eliminated completely by repeated observations. **True/False**

74. Instrumental error is a type of random error. **True/False**

75. In least count based instruments, reading errors are often systematic. **True/False**

76. The number of significant figures in a result should be the same as the quantity with the least significant figures used in the calculation. **True/False**

77. If a reading is written as 1.500 cm, it has 4 significant figures. **True/False**

78. A measurement recorded as 0.00520 has 3 significant figures. **True/False**

79. The error in measuring a quantity squared is twice the percentage error in the base quantity. **True/False**

80. Dimensional analysis can be used to derive physical relationships between variables. **True/False**

81. Dimensional consistency ensures an equation is correct in terms of physical quantities. **True/False**

82. Dimensional analysis cannot determine numerical constants like π or 1/2 in equations. **True/False**

83. If the dimensions of both sides of an equation do not match, the equation must be incorrect. **True/False**

84. Dimensional analysis is helpful in converting units between different systems. **True/False**

85. The time period of a simple pendulum being proportional to $\sqrt{(L/g)}$ can be verified using dimensional analysis. **True/False**

86. The drag force $F_n \propto \rho v^2 A$ is dimensionally consistent, where ρ = density, v = velocity, and A = area. **True/False**

87. **Assertion:** Force can be added to pressure.

Reason: Force and pressure have same dimensions.

(1) If both Assertion and Reason are true and Reason is the correct explanation of Assertion.

(2) If both Assertion and Reason are true but Reason is not correct explanation of Assertion.

(3) If Assertion is true but Reason is false.

(4) If both Assertion and Reason are false.

88. **Assertion:** Both velocity and speed have same dimensions.

Reason: Velocity cannot be added to speed.

(1) If both Assertion and Reason are true and Reason is the correct explanation of Assertion.

(2) If both Assertion and Reason are true but Reason is not correct explanation of Assertion.

(3) If Assertion is true but Reason is false.

(4) If both Assertion and Reason are false.

89. **Assertion:** The given equation $x = x_0 + u_0t + 1/2\ at^2$ is dimensionally correct, where x is the distance travelled by a particle in time t, initial position x_0 initial velocity u_0 and uniform acceleration a is along the direction of motion.

Reason: Dimensional analysis can be used for checking the dimensional consistency or homogeneity of the equation.

(1) If both Assertion and Reason are true and Reason is the correct explanation of Assertion.

(2) If both Assertion and Reason are true but Reason is not correct explanation of Assertion.

(3) If Assertion is true but Reason is false.

(4) If both Assertion and Reason are false.

90. **Assertion:** Mass, length and time are fundamental physical quantities.

Reason: They are independent of each other.

(1) If both Assertion and Reason are true and Reason is the correct explanation of Assertion.

(2) If both Assertion and Reason are true but Reason is not correct explanation of Assertion.

(3) If Assertion is true but Reason is false.

(4) If both Assertion and Reason are false.

91. **Assertion:** Density is a derived physical quantity.

Reason: Density cannot be derived from the fundamental physical quantities.

(1) If both Assertion and Reason are true and Reason is the correct explanation of Assertion.

(2) If both Assertion and Reason are true but Reason is not correct explanation of Assertion.

(3) If Assertion is true but Reason is false.

(4) If both Assertion and Reason are false.

92. **Assertion:** When we change the unit of measurement of a quantity, its numerical value changes.

Reason: Smaller the unit of measurement, smaller is its numerical value.

(1) If both Assertion and Reason are true and Reason is the correct explanation of Assertion.

(2) If both Assertion and Reason are true but Reason is not correct explanation of Assertion.

(3) If Assertion is true but Reason is false.

(4) If both Assertion and Reason are false.

93. **Assertion:** L/R and CR both have the same dimensions.

Reason: L/R and CR both have the dimension of time.

(1) If both Assertion and Reason are true and Reason is the correct explanation of Assertion.

(2) If both Assertion and Reason are true but Reason is not correct explanation of Assertion.

(3) If Assertion is true but Reason is false.

(4) If both Assertion and Reason are false.

94. **Assertion:** A screw gauge having a smaller value of pitch has greater accuracy.

Reason: The least count of screw gauge is directly proportional to the number of divisions on circular scale.

(1) If both Assertion and Reason are true and Reason is the correct explanation of Assertion.

(2) If both Assertion and Reason are true but Reason is not correct explanation of Assertion.

(3) If Assertion is true but Reason is false.

(4) If both Assertion and Reason are false.

95. **Assertion:** All unitless quantities are dimensionless.

Reason: Dimensions are exponent raised to fundamental units in derived units.

(1) If both Assertion and Reason are true and Reason is the correct explanation of Assertion.

(2) If both Assertion and Reason are true but Reason is not correct explanation of Assertion.

(3) If Assertion is true but Reason is false.

(4) If both Assertion and Reason are false.

96. **Assertion:** Power of an engine depends on mass, angular speed, torque and angular momentum, so the formula of power is not derived with the help of dimensional method.

Reason: In mechanics, if a particular quantity depends on more than three quantities, then we cannot derive the formula of the quantity by the help of dimensional method.

(1) If both Assertion and Reason are true and Reason is the correct explanation of Assertion.

(2) If both Assertion and Reason are true but Reason is not correct explanation of Assertion.

(3) If Assertion is true but Reason is false.

(4) If both Assertion and Reason are false.

97. **Assertion:** Temperature cannot be expressed as a derived quantity in terms of length and mass.

Reason: Temperature is a fundamental quantity.

(1) If both Assertion and Reason are true and Reason is the correct explanation of Assertion.

(2) If both Assertion and Reason are true but Reason is not correct explanation of Assertion.

(3) If Assertion is true but Reason is false.

(4) If both Assertion and Reason are false.

98. **Assertion:** Quality factor is dimensionless.

Reason: Quality factor depends on resistance, inductance and capacitance of LCR series circuit.

(1) If both Assertion and Reason are true and Reason is the correct explanation of Assertion.

(2) If both Assertion and Reason are true but Reason is not correct explanation of Assertion.

(3) If Assertion is true but Reason is false.

(4) If both Assertion and Reason are false.

99. **Assertion:** The unit of EMF is Joule/Coulomb.

Reason: EMF is an electromagnetic force.

(1) If both Assertion and Reason are true and Reason is the correct explanation of Assertion.

(2) If both Assertion and Reason are true but Reason is not correct explanation of Assertion.

(3) If Assertion is true but Reason is false.

(4) If both Assertion and Reason are false.

100. **Assertion:** A physical quantity is measured and its value is always found to be *nu*; where *n* is the numerical value and u is the unit.

Reason: $n \propto \frac{1}{u}$

(1) If both Assertion and Reason are true and Reason is the correct explanation of Assertion.

(2) If both Assertion and Reason are true but Reason is not correct explanation of Assertion.

(3) If Assertion is true but Reason is false.

(4) If both Assertion and Reason are false.

101. **Assertion:** The random error in the arithmetic mean of 100 observations is *x*; then random error in the arithmetic mean of 400 observations would be *x*/4.

Reason: Arithmetic mean of the magnitudes of absolute errors in *n* measurements of the quantity is represented by $\overline{\Delta a} = \frac{|\Delta a_1| + |\Delta a_2| + ... + |\Delta a_n|}{n}$

(1) If both Assertion and Reason are true and Reason is the correct explanation of Assertion.

(2) If both Assertion and Reason are true but Reason is not correct explanation of Assertion.

(3) If Assertion is true but Reason is false.

(4) If both Assertion and Reason are false.

102. **Assertion:** Systematic error can be minimized.
Reason: Systematic error can be calculated.
(1) If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
(2) If both Assertion and Reason are true but Reason is not correct explanation of Assertion.
(3) If Assertion is true but Reason is false.
(4) If both Assertion and Reason are false.

103. **Assertion:** The period of oscillation of a simple pendulum in the experiment is recorded as 2.63 s, 2.56 s, 2.42 s, 2.71 s and 2.80 s, respectively. The average absolute error is 0.11 s.
Reason: Mean absolute error

$$\frac{\text{Sum of absolute errors}}{\text{Numbers of observations}}$$

(1) If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
(2) If both Assertion and Reason are true but Reason is not correct explanation of Assertion.
(3) If Assertion is true but Reason is false.
(4) If both Assertion and Reason are false.

104. **Assertion:** Measurement's precision is determined by least count of measuring instrument.
Reason: Smaller the least count, more is the precision.
(1) If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
(2) If both Assertion and Reason are true but Reason is not correct explanation of Assertion.
(3) If Assertion is true but Reason is false.
(4) If both Assertion and Reason are false.

105. **Assertion:** Specific gravity of liquid is dimensionless.
Reason: It is the ratio of density of liquid to density of water.
(1) If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
(2) If both Assertion and Reason are true but Reason is not correct explanation of Assertion.
(3) If Assertion is true but Reason is false.
(4) If both Assertion and Reason are false.

106. **Assertion:** Methods of dimensions cannot be used for deriving formula containing trigonometric ratios.
Reason: Trigonometric ratios have no dimensions.
(1) If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
(2) If both Assertion and Reason are true but Reason is not correct explanation of Assertion.
(3) If Assertion is true but Reason is false.
(4) If both Assertion and Reason are false.

107. **Assertion:** Both plane and solid angles are fundamental units.
Reason: Both have the same units.
(1) If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
(2) If both Assertion and Reason are true but Reason is not correct explanation of Assertion.
(3) If Assertion is true but Reason is false.
(4) If both Assertion and Reason are false.

108. **Assertion:** Astronomical unit is a unit for measuring large distances.
Reason: It is the distance covered by light in one year.
(1) If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
(2) If both Assertion and Reason are true but Reason is not correct explanation of Assertion.
(3) If Assertion is true but Reason is false.
(4) If both Assertion and Reason are false.

ANSWER KEY

1.	(True)	37.	(False)	73.	(True)
2.	(False)	38.	(True)	74.	(False)
3.	(True)	39.	(False)	75.	(True)
4.	(True)	40.	(False)	76.	(True)
5.	(True)	41.	(True)	77.	(True)
6.	(False)	42.	(True)	78.	(True)
7.	(True)	43.	(True)	79.	(True)
8.	(True)	44.	(True)	80.	(True)
9.	(False)	45.	(True)	81.	(True)
10.	(True)	46.	(False)	82.	(True)
11.	(False)	47.	(False)	83.	(True)
12.	(False)	48.	(False)	84.	(True)
13.	(True)	49.	(True)	85.	(True)
14.	(True)	50.	(True)	86.	(True)
15.	(False)	51.	(True)	87.	(4)
16.	(True)	52.	(True)	88.	(2)
17.	(False)	53.	(True)	89.	(1)
18.	(False)	54.	(False)	90.	(1)
19.	(True)	55.	(False)	91.	(3)
20.	(False)	56.	(True)	92.	(3)
21.	(True)	57.	(True)	93.	(1)
22.	(True)	58.	(False)	94.	(3)
23.	(True)	59.	(True)	95.	(2)
24.	(False)	60.	(True)	96.	(1)
25.	(False)	61.	(True)	97.	(1)
26.	(False)	62.	(True)	98.	(2)
27.	(False)	63.	(True)	99.	(3)
28.	(True)	64.	(True)	100.	(1)
29.	(True)	65.	(True)	101.	(2)
30.	(True)	66.	(True)	102.	(1)
31.	(True)	67.	(False)	103.	(1)
32.	(True)	68.	(True)	104.	(1)
33.	(True)	69.	(True)	105.	(1)
34.	(True)	70.	(False)	106.	(1)
35.	(False)	71.	(True)	107.	(4)
36.	(True)	72.	(True)	108.	(3)

PW Web/App - https://smart.link/7wwosivoicgd4

Library- https://smart.link/sdfez8ejd80if