



INTRODUCTORY PHYSICS

MULTIPLE CHOICE QUESTIONS

PREPARED BY:

VARIOUS PHYSICS TEACHERS AT
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CHAPTER 1: INTRODUCTION, MEASUREMENTS, UNITS

Formulas & Constants

$A = L \times W$ (Rectangle's area)	$A = \pi R^2$ (Circle's area)	Volume = Area \times Height	$c = 299,792,458 \text{ m/s}$ (speed of light in vacuum)	$1 \text{ u} = 1.6605 \times 10^{-27} \text{ kg}$ (atomic mass unit)
$1 \text{ m/s} = 3.6 \text{ km/h}$	1 giga (G) = 10^9	1 mega (M) = 10^6	1 kilo (k) = 10^3	1 centi (c) = 10^{-2}
1 milli (m) = 10^{-3}	1 micro (μ) = 10^{-6}	1 nano (n) = 10^{-9}	1 in. = 2.54 cm	1 ft = 12 in.
1 yd = 3 ft	1 mi = 5280 ft	1 mi = 1.61 km	1 L = 1000 cm ³	
	Dimension of length: L	Dimension of time: T	Dimension of mass: M	

Key Terms & Definitions

Accuracy	دقة
Analysis	تحليل
Base units	الوحدات الأساسية
Concept	مفهوم
Conversion	تحويل
Data	بيانات
Decimal place	منزلة عشرية
Detect	يكشف
Diameter	قطر دائرة
Digit	منزلة رقمية
Dimension	بعد
Equation	معادلة
Estimate	تقدير
Evidence	دليل
Experiment	تجربة

Fact	حقيقة
Guess	تخمين
Hypothesis	فرضية
Law	قانون
Measurement	قياس
Model	نموذج
Observation	ملاحظة
Order of magnitude	الترتيب المقداري
Percentage	نسبة مئوية
Phenomenon	ظاهرة
Power-of-ten	أس العشرة
Precision	ضبط
Prediction	توقع
Prefix	أداة بادئة
Principle	مبدأ

Relationship	علاقة
Rounding	تقريب
Science	علم
Scientific attitude	المنهج العلمي
Scientific method	الطريقة العلمية
Scientific notation	الترميز العلمي
SI System	نظام الوحدات العالمي
Significant figures	الأرقام المعنوية
Speculation	تأمل
Standard	معياري
Technology	تقنية
Test	اختبار
Theory	نظرية
Uncertainty	هامش الخطأ
Unit	وحدة

Science; Scientific Method; Scientific Attitude

1. ①The test of truth in science is:

A	experiment✓
B	speculation
C	hypothesis
D	facts

2. ①Good science is distinguished (يتميز) by:

A	inconsistency (عدم التوافق)
B	emotion (العاطفة)
C	imagination (الخيال)
D	measurements (القياس)✓

3. ②Our ability to measure something indicates (يشير إلى) how well we _____ that thing.

A	like
B	ignore (يجهل)
C	know✓

D misunderstand (يسيء الفهم)

4. ②The scientific method does NOT include:

A	hypothesis (فرضية)
B	speculation (تأمل)✓
C	experiment (تجربة)
D	prediction (توقع)

5. ①A scientific hypothesis is:

A	an experiment (تجربة)
B	a final conclusion (خلاصة)
C	an educated guess (تخمين مدروس)✓
D	a verified prediction (توقع محقق)

6. ②A scientific hypothesis:

A	is always true
B	is always false
C	can be tested for falsehood✓
D	is not important in science

7. ③The three main elements of a scientific method are:

A	hypothesis, prediction, conclusion
B	hypothesis, conclusion, speculation
C	speculation, hypothesis, experiment
D	hypothesis, prediction, experiment ✓

8. ①Of the following, the only scientific hypothesis is:

A	souls (الأرواح) move faster than light
B	atoms are the smallest particles in the world ✓
C	Einstein was the greatest scientist ever
D	space is filled with undetectable (غير مكتشف) matter

9. ①Which of these is NOT a scientific hypothesis?

A	atomic nuclei are the smallest particles in nature
B	a magnet will pick up a copper coin
C	cosmic rays cannot penetrate a physics textbook
D	sound is made of untestable waves ✓

10. ①A nonscientific hypothesis is:

A	an electron is heavier than a proton
B	heavy objects fall faster than light objects
C	sunset helps poetry ✓
D	the Moon is farther than the Sun

11. ①Which of these is NOT a scientific hypothesis?

A	protons carry electric charge
B	undetectable particles exist in the nucleus ✓
C	charged particles bend in a magnetic field
D	electricity can travel in plastic

12. ③Characteristics (خصائص) of the scientific attitude include:

A	inquiry (استطلاع), integrity (نزاهة), humility ✓
B	inquiry, integrity, pride (كبرياء)
C	submission (تسليم), integrity, humility (تواضع)
D	submission, inquiry, pride

Physics vs. Other Sciences

13. ①The physical sciences include:

A	biology (علم الأحياء)
B	botany (علم النبات)
C	entomology (علم الحشرات)
D	geology (علم طبقات الأرض) ✓

14. ①The physical sciences do NOT include:

A	chemistry
B	zoology (علم الحيوان) ✓
C	astronomy (علم الفلك)

D	geology (علم طبقات الأرض)
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15. ①The most basic science is:

A	physics ✓
B	chemistry
C	biology
D	geology

16. ②Physics is considered the basic science because:

A	it is most related to our daily experience
B	all other sciences depend on it
C	it is needed for understanding other sciences
D	all of these ✓

Models, Theories, and Laws

17. ②A scientific model helps in _____ some scientific phenomena (ظواهر).

A	rejecting (رفض)
B	changing
C	understanding ✓
D	combining (دمج)

18. ②A scientific model relates (ينسب) a difficult-to-see scientific phenomenon (ظاهرة) to something that is:

A	unfamiliar to us
B	ambiguous (غامض)
C	not discovered (يكتشف) yet
D	familiar to us ✓

19. ②The picture that a scientific model gives for a studied phenomenon (ظاهرة) is:

A	approximate (تقريبي) ✓
B	exact (دقيق)
C	unclear (غير واضح)
D	reverse (معكوس)

20. ②An agreement (توافق) by competent (أكفاء) scientists is a scientific:

A	hypothesis (فرضية)
B	fact (حقيقة) ✓
C	observation (ملاحظة)
D	model (نموذج)

21. ②A hypothesis that has been repeatedly (تكراراً) tested without flaws (خلل) becomes a scientific:

A	prediction (توقع)
B	observation (ملاحظة)
C	law (قانون) ✓
D	experiment (تجربة)

22. ②A synthesis (تجميع) of many well-verified (محقق) hypotheses (فرضيات) is a scientific:

A	prediction (توقع)
B	theory (نظرية)✓
C	law (قانون)
D	experiment (تجربة)

23. ②In science, a theory is:

A	an educated guess
B	less correct than a fact
C	a synthesis (تجميع) of many well-tested hypotheses✓
D	unchangeable

24. ②A scientific fact is rejected (يرفض) if scientists find that it:

A	is disproved (ينقض) by evidence (أدلة)✓
B	has become more than 500 years old
C	disagrees with local politics
D	actually, a fact is always a fact

25. ①The equations $F = ma$ is an example of a physics:

A	theory
B	model
C	law✓
D	prediction

Uncertainty, Accuracy, and Precision

26. ②When are measurements absolutely (تماماً) precise?

A	usually
B	sometimes
C	always
D	never✓

27. ①There is uncertainty associated with every:

A	measurement✓
B	law
C	equation
D	principle


28. ①Main causes of uncertainty in measurements are limitations (محدودية) in:

A	instruments' accuracy and experiment time
B	instruments' (أجهزة) accuracy and human ability✓
C	experiment time and human ability
D	experiment time and lab conditions

29. ①When we use a ruler of 1 millimeter smallest divisions, the uncertainty is approximately (تقريباً) equal to:

A	0.1 mm
B	1 mm✓
C	2.5 mm
D	5 mm

30. ①Using a ruler with cm and mm divisions to measure a certain length, we get a value of 12.8 cm. Our measurement can then be written as:

A	$L = 12.8 \pm 1.0$ cm	
B	$L = 12.8 \pm 0.01$ cm	
C	$L = 12.8 \pm 0.2$ cm	
D	$L = 12.8 \pm 0.1$ cm✓	

31. ②Using a ruler with cm and mm divisions to measure a certain length, we get a value of 12.8 cm. Our measurement can then be written as:

A	$L = 12.8 \text{ cm} \pm 1\%$ ✓
B	$L = 12.8 \text{ cm} \pm 5\%$
C	$L = 12.8 \text{ cm} \pm 10\%$
D	$L = 12.8 \text{ cm} \pm 20\%$


32. ①The percent uncertainty in the measurement $L = 20.2 \pm 0.4$ cm is:

A	0.5%
B	1%
C	2%✓
D	4%

33. ②The percent uncertainty in a measurement $A = 2.03 \text{ m}^2$ is:

A	0.5%✓
B	2%
C	5%
D	10%

34. ③A scale (ميزان) has ± 0.05 g accuracy. Weighing a diamond (ماسة) on it gives 8.17 g one day and 8.09 g another day. These two measurements:

A	are unacceptable within the scale's accuracy	
B	are acceptable within the scale's accuracy✓	
C	prove that the scale's accuracy is incorrect	
D	prove that these are two different diamonds	

35. ①The ability of an instrument (جهاز) to repeatedly (تكراراً) give close (متقارب) measurements is called:

A	accuracy
B	uncertainty
C	deviation
D	precision✓

36. ①The ability of an instrument (جهاز) to give

measurements close (مقارب) to the true values is called:

A	accuracy✓
B	uncertainty
C	deviation
D	precision

$A + B$ should be the same as the _____ accuracy of A and B.

A	most (أكثر)
B	least (أقل)✓
C	average (متوسط)
D	inverse (عكسي)

Significant Figures

37. ①The number of reliably (بشكل موثوق) known digits (أرقام) in a number is its:

A	uncertainty
B	accuracy
C	significant figures✓
D	percent error

44. ②Taking accuracy into account, the difference $D = A - B$ between two numbers, $A = 3.6$ and $B = 0.57$, is correctly written as:

A	3.03
B	3.00
C	3.003
D	3.0✓

38. ①The number of significant figures in (23.20) is:

A	1
B	2
C	3
D	4✓

45. ②Taking accuracy into account, the sum $S = A + B$ of two numbers, $A = 3.6$ and $B = 0.40$, is correctly written as:

A	4.0✓
B	4.00
C	4
D	04.

39. ②The number of significant figures in (0.062) is:

A	1
B	2✓
C	3
D	4

46. ②Taking significant figures into account, the product $P = A \times B$ of two numbers, $A = 12.0$ and $B = 12$, is correctly written as:

A	144
B	140✓
C	150
D	100

40. ①The number of decimal places in (0.062) is:

A	1
B	2
C	3✓
D	4

47. ①Taking significant figures into account, the quotient $Q = A \div B$ of two numbers, $A = 12.0$ and $B = 12$, is correctly written as:

A	1.00
B	1
C	1.0✓
D	1.000

41. ①The area of a (10.0 cm \times 6.5 cm) rectangle is correctly given as:

A	65 cm ² ✓
B	65.0 cm ²
C	65.00 cm ²
D	65.000 cm ²

48. ①Dividing 2.0 by 3.0 with a calculator gives 0.66666666. Taking significant figures into account, this result should be written as:

A	0.7
B	0.6667
C	0.667
D	0.67✓

42. ②The significant figures in the product of two numbers ($P = A \times B$) should be the same as the _____ significant figures of A and B.

A	most (أكثر)
B	least (أقل)✓
C	average (متوسط)
D	inverse (عكسي)

49. ③For $A = 0.01234$, $B = 0.00123$, and $C = 0.00012$, the number with the most significant figures is:

A	A only✓
B	B only

43. ③The accuracy in the sum of two numbers ($S =$

C	C only
D	they all are the same

50. ①For $A = 0.01234$, $B = 0.00123$, and $C = 0.00012$, the number with the most decimal places is:

A	A only
B	B only
C	C only
D	they all are the same✓

Scientific Notation

51. ②Scientific notation allows the number of significant figures to be:

A	clearly expressed✓
B	carefully hidden
C	neglected
D	avoided

52. ①In the scientific notation, 36900 is written as:

A	3.69×10^3
B	3.69×10^4 ✓
C	36.9×10^3
D	0.369×10^4

53. ①The scientific notation for 325 is:

A	3.25×10^2 ✓
B	3.25×10^1
C	32.5×10^0
D	32.5×10^{-1}

54. ①In the scientific notation, 0.0021 is written as:

A	21×10^{-2}
B	2.1×10^{-3} ✓
C	21×10^{-3}
D	2.1×10^{-4}

55. ①The scientific notation for 7.33 is:

A	7.33×10^2
B	7.33×10^1
C	7.33×10^0 ✓
D	7.33×10^{-1}

56. ①The number 3.69×10^2 is equivalent to:

A	369✓
B	36.9
C	3.69
D	0.369

57. ①The number 3.7×10^{-1} is equivalent to:

A	3.70
B	0.37✓
C	37.0
D	0.037

58. ①The decimal form for 7.62×10^2 is:

A	7.62
B	762✓
C	76.2
D	0.762

59. ①The decimal form for 6.150×10^{-4} is:

A	0.0615000
B	0.0061500
C	0.0006150✓
D	0.0000615

60. ②Taking significant figures into account, the product $P = A \times B$ of two numbers, $A = 2.079 \times 10^2$ and $B = 0.072 \times 10^{-1}$, is correctly written as:

A	1.49688
B	1.497
C	1.5✓
D	1.50

61. ②For $A = 3.69 \times 10^4$, $B = 3.690 \times 10^2$, and $C = 3.6900 \times 10^{-3}$, the number with the most significant figures is:

A	A only
B	B only
C	C only✓
D	they have same number of significant figures

Units & Standards

62. ②A standard is a fixed reference (مراجع) for a:

A	model
B	equation
C	law
D	unit✓

63. ①The standard of the meter is the distance traveled by light in vacuum in $1/299792458$ of a(an):

A	hour
B	second✓
C	minute
D	day

64. ①The old standard of the second was $1/86400$ of an average solar (شمسي):

A	hour
B	minute
C	day✓
D	year

65. ①The new standard of the second is defined in terms of the frequency of radiation (إشعاع) emitted by:

A	electronic devices
B	the sun
C	X-rays
D	cesium atoms✓

66. ①The standard of the kilogram, kept at the Bureau of weights and Measures in France, is a cylinder of:

A	platinum-iridium✓
B	gold-silver
C	wood-iron
D	radium-uranium

67. ①The SI unit of mass is the:

A	newton
B	kilogram✓
C	pound
D	gram

68. ①Which of the following is NOT an SI unit?

A	newton
B	kilogram
C	pound✓
D	ampere

SI Prefixes & Base Units

69. ①The SI abbreviation for 36 centimeters is:

A	36 centim
B	36 cmeter
C	36 cm✓
D	36 centimeters

70. ①1 Mm (mega-meter) equals:

A	1000 m
B	1000 km✓
C	1000000 km
D	100000 m

71. ①1 μg (microgram) equals:

A	0.0000001 g
B	0.0001 g
C	0.000001 g✓

D	0.00001 g
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72. ②Of the following SI units, the only base unit is:

A	newton
B	watt
C	gram
D	ampere✓

73. ②Of the following SI units, the only derived (مشتق) unit is:

A	volt✓
B	kilogram
C	kelvin
D	meter

74. ②A time interval of 60.0 μs is equal to:

A	0.0600 s
B	0.00600 s
C	0.000600 s
D	0.0000600 s✓

75. ②An electric current of 3×10^{-9} A is equal to:

A	3 μA
B	3 MA
C	3 nA✓
D	3 mA

Unit Conversion

76. ②Converting 215 cm to meters gives:

A	0.0215 m
B	0.215 m
C	21.5 m
D	2.15 m✓

77. ①A distance of 0.05 km is equal to:

A	5000 cm✓
B	500 cm
C	50000 cm
D	500000 cm

78. ①A length of 286.6 mm is equal to:

A	28.66 cm✓
B	286.6 cm
C	2.866 m
D	0.00286 μm

79. ②Convert 84 in. to feet:

A	5 ft
B	6 ft

C	7 ft✓
D	8 ft

80. ①Convert 15 miles to the nearest kilometers:

A	18 km
B	24 km✓
C	33 km
D	42 km

81. ①Convert 258 cm² to m²:

A	0.0258 m ² ✓
B	0.258 m ²
C	2.58 m ²
D	25.8 m ²

82. ②Convert 0.65 cm³ to mm³:

A	6500 mm ³
B	6.5 mm ³
C	65 mm ³
D	650 mm ³ ✓

83. ②A distance of 10 ft is equal to:

A	305 m
B	305 cm✓
C	30.5 cm
D	30.5 m

84. ①Express 10 in. in centimeters:

A	0.254 cm
B	254 cm
C	25.4 cm✓
D	2.54 cm

85. ②Convert 2 h 15 min to seconds:

A	8100 s✓
B	2100 s
C	5900 s
D	3500 s ³

86. ②A school speed-zone (نطاق) is 30 km/h. Three cars A, B, and C are going at speeds $v_A = 8$ m/s, $v_B = 9$ m/s, and $v_C = 10$ m/s. The cars that will receive speeding tickets are:

A	A, B, and C
B	C only
C	B and C✓
D	none

87. ②The maximum capacity in liters of a 3-m³ water tank (خزان) is:

A	30 L
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B	3000 L✓
C	300 L
D	3 L

88. ②One light year is:

A	the speed of light in vacuum
B	the time that sunlight takes to reach the Moon
C	the distance light travels in 1 year✓
D	the time that sunlight takes to reach the Earth

89. ③If there are 3×10^7 seconds in one year, a distance of one light year is equal to:

A	9×10^{15} m✓
B	9×10^{13} m
C	9×10^{11} m
D	9×10^9 m

Order of Magnitude; Estimation

90. ②Rounding (تقريب) a number to one digit multiplied by its power-of-ten gives its:

A	precision
B	accuracy
C	uncertainty
D	order of magnitude✓

91. ②The 14 highest peaks in the world are between 8000 m and 9000 m high. The order-of-magnitude of their height (ارتفاع) is:

A	1×10^4 m✓
B	0.1×10^4 m
C	2×10^4 m
D	10×10^4 m

92. ②A lake (بحيرة) is roughly (تقريباً) circular, with a 1-km diameter and 10-m average depth (عمق). Its water capacity can be estimated as:

A	1×10^6 m ³
B	1×10^7 m ³ ✓
C	1×10^8 m ³
D	1×10^9 m ³

93. ①The thickness (سمائة) of a 200-page book is 1.0 cm. The thickness of one sheet of this book can be estimated as:

A	0.001 mm
B	0.01 mm
C	0.1 mm✓
D	1 mm

94. ②If an average human lives for 70 years, and if the

heartbeat rate is 80 beats/min, the number of heartbeats in a lifetime can be estimated as:

A	3×10^6
B	3×10^7
C	3×10^8
D	3×10^9 ✓

Dimensions

95. ① The dimensions of area are:

A	$L^2 T$
B	L^2 ✓
C	L^3/T^2
D	$L^2 T^{-1}$

96. ① The dimensions of volume are:

A	L^3 ✓
B	L^2
C	L^3/T^2
D	$L^2 T^{-1}$

97. ② The dimensions of force are:

A	$L M T$
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B	$L M T^{-2}$ ✓
C	$L^3 M^2/T^2$
D	$L^2 M T^{-1}$

98. ② The dimensions of acceleration are:

A	$L T$
B	$L T^{-2}$ ✓
C	L^3/T^2
D	$L^2 T^{-1}$

99. ② The dimensions of momentum ($p = mv$) are:

A	$L M T$
B	$L M T^{-2}$
C	$L M T^{-1}$ ✓
D	$L^2 M T^{-1}$

100. ② Which of the following is dimensionally correct?

A	speed = acceleration / time
B	distance = speed / time
C	force = mass \times acceleration ✓
D	density = mass \times volume