MASSACHUSETTS PHYSICS · FINAL EXAM · 50 QUESTIONS

Final Exam — Practice Test

This practice test was made by AI and there may be mistakes. If a question or answer looks wrong, use the Flag a mistake button to let Brett know so he can fix it.

1

An object moves with initial speed 5 m/s and acceleration 2 $\frac{\text{m}}{\text{s}^2}$ for 3 s. Its displacement is

- A 24 m
- B 15 m
- C 33 m
- D 39 m

Understand It with Pulse | Flag a mistake

2 **A 4 kg object moves at 3 m/s. Its kinetic energy is**

- A 36 J
- B 12 J
- C 6 J
- D 18 J

Understand It with Pulse | Flag a mistake

3 **A voltage of 24 V is applied across a 8 ohm resistor. The current is**

- A 3 A
- B 192 A
- C 32 A
- D 0.33 A

Understand It with Pulse | Flag a mistake

4 **Light in air hits a boundary at incidence angle 40 degrees. The reflection angle is**

- A 50 degrees
- B 80 degrees
- C 40 degrees
- D 20 degrees

Understand It with Pulse | Flag a mistake

5 **Use g = 10 $\frac{m}{s^2}$. An object dropped from rest falls for 3 s. Its speed then, in meters per second, is ____**

ANSWER _____

Understand It with Pulse | Flag a mistake

6 **A machine does 200 J of work in 10 s. Its power is**

- A 20 W
- B 2000 W
- C 0.05 W
- D 210 W

Understand It with Pulse | Flag a mistake

7 **Changing the magnetic flux through a coil**

- A induces a voltage in the coil
- B stops all current
- C has no effect
- D removes the magnetic field

Understand It with Pulse | Flag a mistake

8 An object 6 cm tall is magnified by 2. Its image height is

- A 3 cm
- B 8 cm
- C 12 cm
- D 4 cm

Understand It with Pulse | Flag a mistake

9 An object starts from rest and accelerates at 3 $\frac{m}{s^2}$ for 4 s. Its final speed is

- A 7 m/s
- B 12 m/s
- C 0.75 m/s
- D 1.33 m/s

Understand It with Pulse | Flag a mistake

10 **A force of 25 N pushes an object 4 m in the direction of the force. The work done is**

- A 100 J
- B 6.25 J
- C 29 J
- D 21 J

Understand It with Pulse | Flag a mistake

11 **In a series circuit, the quantity that is the same through every part is the**

- A voltage
- B resistance
- C current
- D power

Understand It with Pulse | Flag a mistake

12 **The energy of a photon is proportional to its**

- **A** wavelength
- **B** frequency
- **C** speed
- **D** mass

Understand It with Pulse | Flag a mistake

13 **Use g = 10 $\frac{m}{s^2}$. A ball is thrown upward with vertical speed 20 m/s. The time to reach its highest point is**

- **A** 1 s
- **B** 2 s
- **C** 4 s
- **D** 10 s

Understand It with Pulse | Flag a mistake

14 **A 3 kg object moving at 4 m/s collides and sticks to a stationary 3 kg object. Their common speed is**

- A 4 m/s
- B 8 m/s
- C 2 m/s
- D 12 m/s

Understand It with Pulse | Flag a mistake

15 **A wave has period 0.2 s. Its frequency is**

- A 0.2 Hz
- B 20 Hz
- C 0.04 Hz
- D 5 Hz

Understand It with Pulse | Flag a mistake

16 **The half life of a sample is 10 years. After 30 years, the fraction remaining is**

A one half

B one fourth

C one third

D one eighth

Understand It with Pulse | Flag a mistake

17 **On a velocity time graph, the slope of the line gives the**

A displacement

B acceleration

C average speed

D net force

Understand It with Pulse | Flag a mistake

18 **Use g = 10 $\frac{m}{s^2}$. A 5 kg object is 4 m above the ground. Its gravitational potential energy, in joules, is _____**

ANSWER _____

Understand It with Pulse | Flag a mistake

19 **The unit of electric charge is the**

A ampere

B volt

C ohm

D coulomb

Understand It with Pulse | Flag a mistake

20 **A sample starts with 80 g of a radioactive isotope. After two half lives, the mass remaining is**

- A 80 g
- B 40 g
- C 10 g
- D 20 g

Understand It with Pulse | Flag a mistake

21 **Use g = 10 $\frac{m}{s^2}$. The weight of an 8 kg object is**

- A 0.8 N
- B 80 N
- C 18 N
- D 800 N

Understand It with Pulse | Flag a mistake

22 **The work energy theorem says the net work on an object equals its change in**

A potential energy

B momentum

C kinetic energy

D power

Understand It with Pulse | Flag a mistake

23 **A wave has speed 300 m/s and frequency 50 Hz. Its wavelength, in meters, is _____**

ANSWER _____

Understand It with Pulse | Flag a mistake

24 **Gamma radiation consists of**

A electrons

B helium nuclei

C high energy photons

D protons

Understand It with Pulse | Flag a mistake

25 **An object travels 120 m in 10 s. Its average speed, in meters per second, is ____**

ANSWER _____

Understand It with Pulse | Flag a mistake

26 **An impulse changes an object**

A mass

B weight

C momentum

D volume

Understand It with Pulse | Flag a mistake

27 **When light reflects from a flat mirror, the angle of reflection compared with the angle of incidence is**

A larger

B smaller

C equal

D twice as large

Understand It with Pulse | Flag a mistake

28 **A sample starts with 64 g of a radioactive isotope. After one half life, the mass remaining, in grams, is ____**

ANSWER _____

Understand It with Pulse | Flag a mistake

29 **Displacement differs from distance because displacement includes**

A only the total path length

B direction

C only the time taken

D only the speed

Understand It with Pulse | Flag a mistake

30 **A 4 kg object at rest is pushed by a 12 N force for 3 s. Its final momentum, in kilogram meters per second, is ____**

ANSWER _____

Understand It with Pulse | Flag a mistake

31 **A current of 2 A flows through a resistor of 9 ohms. The voltage across it is**

- A 18 V
- B 4.5 V
- C 11 V
- D 7 V

Understand It with Pulse | Flag a mistake

32 **Light travels from glass into air and speeds up. The ray bends**

- A toward the normal
- B away from the normal
- C not at all
- D back on itself

Understand It with Pulse | Flag a mistake

33 An object moves at 4 m/s and accelerates at 3 $\frac{m}{s^2}$ for 2 s. Its displacement is

- **A** 14 m
- **B** 8 m
- **C** 20 m
- **D** 6 m

Understand It with Pulse | Flag a mistake

34 A 3 kg object moves at 6 m/s. Its kinetic energy is

- **A** 18 J
- **B** 9 J
- **C** 108 J
- **D** 54 J

Understand It with Pulse | Flag a mistake

35 **If the frequency of a wave doubles while its speed stays the same, its wavelength**

- A doubles
- B halves
- C quadruples
- D stays the same

Understand It with Pulse | Flag a mistake

36 **The half life of a sample is 5 years. After 15 years, the fraction remaining is**

- A one half
- B one fourth
- C one eighth
- D one sixteenth

Understand It with Pulse | Flag a mistake

37 **Use g = 10 $\frac{m}{s^2}$. The weight of a 12 kg object, in newtons, is _____**

ANSWER _____

Understand It with Pulse | Flag a mistake

38 **A machine does 450 J of work in 15 s. Its power, in watts, is _____**

ANSWER _____

Understand It with Pulse | Flag a mistake

39 **The current through a 12 ohm resistor at 36 V, in amperes, is _____**

ANSWER _____

Understand It with Pulse | Flag a mistake

40 **An object 5 cm tall is magnified by 4. Its image height, in centimeters, is _____**

ANSWER _____

Understand It with Pulse | Flag a mistake

41 **The coefficient of kinetic friction is 0.4 and the normal force is 50 N. The kinetic friction force is**

A 20 N

B 90 N

C 125 N

D 10 N

Understand It with Pulse | Flag a mistake

42 **If an object height doubles while its mass stays the same, its gravitational potential energy**

A halves

B quadruples

C stays the same

D doubles

Understand It with Pulse | Flag a mistake

43 **Sound cannot travel through a vacuum because sound needs a**

A light source

B magnetic field

C wire

D medium

Understand It with Pulse | Flag a mistake

44 **The color of light with the longest wavelength in the visible spectrum is**

A violet

B blue

C green

D red

Understand It with Pulse | Flag a mistake

45 **A 3 kg object is pulled with a net force of 18 N. Its acceleration, in meters per second squared, is _____**

ANSWER _____

Understand It with Pulse | Flag a mistake

46 **Power is defined as work divided by**

A distance

B force

C time

D mass

Understand It with Pulse | Flag a mistake

47 **A device uses current 4 A at voltage 5 V. Its power, in watts, is _____**

ANSWER _____

Understand It with Pulse | Flag a mistake

48 **Nuclear power plants in common use get energy mainly from**

A fusion

B photoelectric emission

C refraction

D fission

Understand It with Pulse | Flag a mistake

49 **Two forces of 25 N and 15 N act in opposite directions. The size of the net force, in newtons, is _____**

ANSWER _____

Understand It with Pulse | Flag a mistake

50 **A force of 15 N moves an object 6 m. The work done, in joules, is _____**

ANSWER _____

Understand It with Pulse | Flag a mistake

ANSWER KEY

1. A
2. D
3. A
4. C
5. 30
6. A
7. A
8. C
9. B
10. A
11. C
12. B
13. B
14. C
15. D
16. D
17. B
18. 200
19. D
20. D
21. B
22. C
23. 6
24. C
25. 12
26. C
27. C
28. 32
29. B
30. 36
31. A
32. B
33. A
34. D
35. B
36. C
37. 120
38. 30
39. 3
40. 20
41. A
42. D
43. D
44. D
45. 6
46. C
47. 20
48. D
49. 10
50. 90

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