ONTARIO PHYSICS, GRADE 12, UNIVERSITY PREPARATION (SPH4U) · 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 **Newton second law states that net force equals mass times**

- A Energy
- B Momentum
- C Acceleration
- D Velocity

Understand It with Pulse | Flag a mistake

2 **A force of 20 newtons moves an object 5 metres in the direction of the force. The work done, in joules, is**

ANSWER _____

Understand It with Pulse | Flag a mistake

3 **A mass of 4 kilograms experiences gravitational force 40 newtons. The field strength, in newtons per kilogram, is**

ANSWER _____

Understand It with Pulse | Flag a mistake

4 **In Young double slit experiment, bright fringes occur where waves arrive**

A With zero amplitude

B At different speeds

C In phase

D Out of phase

Understand It with Pulse | Flag a mistake

5 **Weight is the force of gravity on a mass and depends on**

- A Gravitational field strength
- B Density only
- C Volume only
- D Temperature

Understand It with Pulse | Flag a mistake

6 **A mass of 4 kilograms at height 10 metres in a field of 9.8 newtons per kilogram has gravitational potential energy, in joules, of**

ANSWER _____

Understand It with Pulse | Flag a mistake

7 **The electric field between parallel plates is approximately**

- A Uniform
- B Radial
- C Circular
- D Zero

Understand It with Pulse | Flag a mistake

8 **Single slit diffraction produces a wide central maximum because waves from different parts of the slit**

- A Interfere
- B Are absorbed
- C Arrive in phase
- D Travel at different speeds

Understand It with Pulse | Flag a mistake

9 **Kinetic friction is generally**

A Less than maximum static friction

B Zero always

C Greater than maximum static friction

D Equal to weight

Understand It with Pulse | Flag a mistake

10 **Power is defined as work done per unit**

A Distance

B Mass

C Force

D Time

Understand It with Pulse | Flag a mistake

11 **Coulomb law states electric force is proportional to the product of charges and inversely proportional to distance**

A Not at all

B Squared

C Cubed

D Directly

Understand It with Pulse | Flag a mistake

12 **The photoelectric effect shows light also behaves as**

A Waves only

B Particles called photons

C Magnetic fields

D Sound waves

Understand It with Pulse | Flag a mistake

13 **Static friction acts to prevent motion between surfaces that are**

A Moving rapidly

B Lubricated fully

C In free fall

D At rest relative to each other

Understand It with Pulse | Flag a mistake

14 **Momentum is defined as mass times**

A Energy

B Velocity

C Force

D Acceleration

Understand It with Pulse | Flag a mistake

15 **The direction of the magnetic field around a straight current carrying wire is given by the**

A Left hand rule

B Right hand grip rule

C Lenz law only

D Fleming rule only

Understand It with Pulse | Flag a mistake

16 **Photon energy is proportional to frequency and given by Planck constant times**

A Amplitude

B Wavelength

C Speed

D Frequency

Understand It with Pulse | Flag a mistake

17 **An object moving at 10 metres per second in a circle of radius 20 metres has centripetal acceleration, in metres per second squared, of**

ANSWER

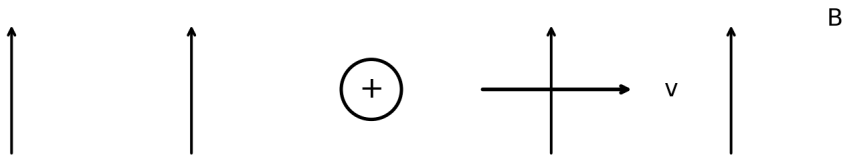
Understand It with Pulse | Flag a mistake

18 **A force of 50 newtons acting for 0.4 seconds gives impulse, in newton seconds, of**

ANSWER

Understand It with Pulse | Flag a mistake

19 **The diagram shows a positive particle moving right in a magnetic field pointing up. The magnetic force on it points**



- **A** Out of the page
- **B** Into the page
- **C** Right
- **D** Left

Understand It with Pulse | Flag a mistake

20 **Special relativity states the speed of light in a vacuum is the same for all**

- **A** Stationary objects only
- **B** Inertial observers
- **C** Materials
- **D** Accelerating observers only

Understand It with Pulse | Flag a mistake

21 **The period of circular motion is the time for**

A A quarter revolution

B Half a revolution

C Two revolutions

D One full revolution

Understand It with Pulse | Flag a mistake

22 **A longer collision time reduces the average force because impulse equals force times**

A Mass

B Distance

C Time

D Speed

Understand It with Pulse | Flag a mistake

23 **An electric motor converts electrical energy into**

A Chemical energy

B Mechanical energy

C Thermal energy only

D Light only

Understand It with Pulse | Flag a mistake

24 **Mass energy equivalence is expressed by Einstein equation E equals mass times speed of light**

A Cubed

B Doubled

C Squared

D Halved

Understand It with Pulse | Flag a mistake

25 **Kepler second law states that a planet sweeps out equal areas in equal**

A Times

B Speeds

C Distances

D Masses

Understand It with Pulse | Flag a mistake

26 **A pendulum at its highest point has maximum potential energy and**

A Maximum kinetic energy

B Zero kinetic energy

C Maximum momentum

D Zero total energy

Understand It with Pulse | Flag a mistake

27 **A transformer works only with**

A Alternating current

B Static charge

C Direct current

D No current

Understand It with Pulse | Flag a mistake

28 **The hydrogen spectrum consists of discrete lines because energy levels are**

A Infinite

B Quantized

C Continuous

D Random

Understand It with Pulse | Flag a mistake

29 **Two 2 kilogram masses 1 metre apart experience gravitational force using G 6.67 × 10^{-11} . The force × 10^{10} , in newtons , is approximately**

ANSWER

Understand It with Pulse | Flag a mistake

30 **A spring constant is larger for a spring that is**

A Easier to stretch

B Heavier

C Stiffer

D Longer always

Understand It with Pulse | Flag a mistake

31 **Gravitational potential energy is negative for bound systems because work must be done to**

A Increase mass

B Separate them to infinity

C Bring masses together

D Stop motion

Understand It with Pulse | Flag a mistake

32 **Constructive interference occurs when path difference is a whole number of**

A Wavelengths

B Amplitudes

C Speeds

D Frequencies

Understand It with Pulse | Flag a mistake

33 **A free body diagram shows all forces acting**

A Between atoms

B By the object

C On the object

D Inside the object only

Understand It with Pulse | Flag a mistake

34 **A watt is equal to one joule per**

A Metre

B Newton

C Second

D Kilogram

Understand It with Pulse | Flag a mistake

35 **A Van de Graaff generator builds up charge by**

A Transfer of charge by a belt

B Heating

C Magnetism

D Induction only

Understand It with Pulse | Flag a mistake

36 **A soap bubble shows colours because film thickness varies and different wavelengths interfere**

A Not at all

B Only in red

C Destructively everywhere

D Constructively at different places

Understand It with Pulse | Flag a mistake

37 **Terminal velocity is reached when air resistance equals**

A Speed

B Mass

C Weight

D Acceleration

Understand It with Pulse | Flag a mistake

38 **A 10 kilogram object falling from 5 metres gains kinetic energy, ignoring air resistance, in joules, of about**

ANSWER _____

Understand It with Pulse | Flag a mistake

39 **The magnetic field inside a long solenoid is approximately**

- A Zero
- B Radial
- C Decreasing to zero
- D Uniform

Understand It with Pulse | Flag a mistake

40 **Compton scattering shows photons can transfer momentum to electrons, supporting the**

- A Particle model of light
- B Bohr model only
- C Wave model only
- D Classical model

Understand It with Pulse | Flag a mistake

41 **A friction force of 12 newtons with normal force 40 newtons gives a coefficient of friction of**

ANSWER _____

Understand It with Pulse | Flag a mistake

42 **Two objects with equal momentum but different masses have speeds that are**

A Directly related to mass

B Equal

C Zero

D Inversely related to mass

Understand It with Pulse | Flag a mistake

43 **Back EMF in a motor opposes the applied voltage and increases with**

A Current

B Resistance

C Speed of rotation

D Mass

Understand It with Pulse | Flag a mistake

44 **A muon reaching Earth surface despite its short lifetime is explained by time dilation in the muon**

A Decay

B Rest frame only

C Absence

D Frame relative to Earth

Understand It with Pulse | Flag a mistake

45 **A conical pendulum has its string tension providing both weight balance and**

- A Friction
- B Drag
- C Centripetal force
- D Tangential force

Understand It with Pulse | Flag a mistake

46 **A ballistic pendulum uses conservation of momentum during collision and conservation of energy during the**

- A Collision
- B Impact only
- C Swing upward
- D Fall

Understand It with Pulse | Flag a mistake

47 **Laminated cores reduce eddy currents by increasing**

A Mass

B Resistance between layers

C Conductivity

D Magnetic field

Understand It with Pulse | Flag a mistake

48 **An atom in its ground state has its electrons in the lowest available**

A Energy levels

B Speeds

C Orbits in space

D Shells only

Understand It with Pulse | Flag a mistake

49 **A horizontal projectile has horizontal acceleration of**

A Gravity times mass

B Its initial speed

C 9.8 metres per second squared

D Zero ignoring air resistance

Understand It with Pulse | Flag a mistake

50 **A spring of constant 50 newtons per metre stretched 0.4 metres exerts force, in newtons, of**

ANSWER _____

Understand It with Pulse | Flag a mistake

ANSWER KEY

1.	C	**18.**	20	**35.**	A
2.	100	**19.**	B	**36.**	D
3.	10	**20.**	B	**37.**	C
4.	C	**21.**	D	**38.**	490
5.	A	**22.**	C	**39.**	D
6.	392	**23.**	B	**40.**	A
7.	A	**24.**	C	**41.**	0.3
8.	A	**25.**	A	**42.**	D
9.	A	**26.**	B	**43.**	C
10.	D	**27.**	A	**44.**	D
11.	B	**28.**	B	**45.**	C
12.	B	**29.**	2.67	**46.**	C
13.	D	**30.**	C	**47.**	B
14.	B	**31.**	B	**48.**	A
15.	B	**32.**	A	**49.**	D
16.	D	**33.**	C	**50.**	20
17.	5	**34.**	C		

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