AP Physics 1

Sample Question Paper - 2023

Country: US | Duration: 3 hours | Max Marks: 5-point scale | Language: English

Negative Marking: No | Total Questions: 40 | QuizVerse AI Tutor

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General Instructions:

1. This paper contains 40 questions across 1 section(s): Physics.
2. Duration: 3 hours. Maximum marks: 5-point scale.
3. Negative marking: No.
4. Read each question carefully before answering.

Section 1: Physics (40 Questions)

Q1. Two capacitors 9 uF and 8 uF are connected in series. The equivalent capacitance is:

(A) 2.11 uF

(B) 3.56 uF

(C) 2.76 uF

(D) 4.24 uF

Q2. The de Broglie wavelength of an electron accelerated through 50 V is approximately:

(A) 2.95 Angstrom

(B) 2.67 Angstrom

(C) 2.48 Angstrom

(D) 1.06 Angstrom

Q3. A force of 64 N acts on a 17 kg body initially at rest. The velocity after 4 s is:

(A) 49 m/s

(B) 37 m/s

(C) 7 m/s

(D) 26 m/s

Q4. A Carnot engine operates between 765 K and 254 K. Its efficiency is:

(A) 52%

(B) 65%

(C) 30%

(D) 58%

Q5. Two masses 7 kg and 11 kg are connected by a string over a frictionless pulley. The acceleration of the system is:

(A) 3.18 m/s^2

(B) 5.61 m/s^2

(C) 2.57 m/s^2

(D) 3.15 m/s^2

Q6. An electron moves with velocity 3x10^6 m/s perpendicular to a magnetic field of 0.7 T. The radius of its path is:

(A) 0.85 cm

(B) 2.99 cm

(C) 3.79 cm

(D) 1.21 cm

Q7. A radioactive substance has half-life 30 days. The fraction remaining after 33 days is:

(A) 1/16

(B) 1/4

(C) 1/16

(D) 1/8

Q8. The electric field at 1 m from a point charge of 10 uC is:

(A) 6300 N/C

(B) 2935 N/C

(C) 4338 N/C

(D) 5784 N/C

Q9. The current through a 11 ohm resistor connected to a 12 V battery is:

(A) 2.22 A

(B) 2.81 A

(C) 2.50 A

(D) 2.51 A

Q10. A solenoid of 145 turns and length 0.1 m carries current 4 A. The magnetic field inside is:

(A) 1.19 mT

(B) 9.69 mT

(C) 16.56 mT

(D) 17.15 mT

Q11. The current through a 26 ohm resistor connected to a 15 V battery is:

(A) 0.50 A

(B) 1.89 A

(C) 2.36 A

(D) 2.83 A

Q12. The de Broglie wavelength of an electron accelerated through 100 V is approximately:

(A) 2.20 Angstrom

(B) 2.24 Angstrom

(C) 2.53 Angstrom

(D) 0.53 Angstrom

Q13. A radioactive substance has half-life 26 days. The fraction remaining after 43 days is:

(A) 1/8

(B) 1/32

(C) 1/8

(D) 1/4

Q14. A block of mass 6 kg slides down a frictionless incline of angle 37 degrees. The acceleration is:

(A) 4.1 m/s^2

(B) 5.2 m/s^2

(C) 6.6 m/s^2

(D) 6.8 m/s^2

Q15. The focal length of a concave mirror is 12 cm. An object at 46 cm forms image at:

(A) 35 cm, real inverted

(B) 26 cm, real inverted

(C) 49 cm, real inverted

(D) 32 cm, real inverted

Q16. An ideal gas at 304 K is heated at constant pressure to 757 K. The ratio of final to initial volume is:

(A) 1.6

(B) 2.7

(C) 2.3

(D) 2.0

Q17. The work function of a metal is 4.9 eV. The threshold frequency is:

(A) 9.74 x 10^14 Hz

(B) 10.76 x 10^14 Hz

(C) 4.48 x 10^14 Hz

(D) 9.53 x 10^14 Hz

Q18. A body of mass 4 kg is moving in a circle of radius 8 m at 19 m/s. The centripetal force is:

(A) 124 N

(B) 176 N

(C) 65 N

(D) 146 N

Q19. A projectile is launched at 60 degrees with initial velocity 36 m/s. The time of flight is approximately:

(A) 2.9 s

(B) 2.7 s

(C) 3.2 s

(D) 1.7 s

Q20. Two capacitors 10 uF and 6 uF are connected in series. The equivalent capacitance is:

(A) 3.31 uF

(B) 2.11 uF

(C) 2.91 uF

(D) 4.84 uF

Q21. A convex lens of focal length 16 cm forms a real image of an object placed 22 cm away. The image distance is:

(A) 25 cm

(B) 45 cm

(C) 15 cm

(D) 51 cm

Q22. The electric field at 3 m from a point charge of 6 uC is:

(A) 8811 N/C

(B) 7047 N/C

(C) 672 N/C

(D) 1784 N/C

Q23. The binding energy per nucleon of Fe-56 is approximately:

(A) 8.8 MeV

(B) 7.6 MeV

(C) 6.5 MeV

(D) 9.2 MeV

Q24. Light passes from glass (n=1.6) to air. The critical angle is:

(A) 42 degrees

(B) 46 degrees

(C) 48 degrees

(D) 42 degrees

Q25. The work function of a metal is 1.6 eV. The threshold frequency is:

(A) 11.96 x 10^14 Hz

(B) 10.62 x 10^14 Hz

(C) 9.14 x 10^14 Hz

(D) 3.11 x 10^14 Hz

Q26. The focal length of a concave mirror is 17 cm. An object at 30 cm forms image at:

(A) 17 cm, real inverted

(B) 43 cm, real inverted

(C) 32 cm, real inverted

(D) 23 cm, real inverted

Q27. A car of mass 1229 kg moving at 56 m/s brakes to rest in 7 s. The braking force is:

(A) 11583 N

(B) 5716 N

(C) 14865 N

(D) 10834 N

Q28. The focal length of a concave mirror is 21 cm. An object at 25 cm forms image at:

(A) 15 cm, real inverted

(B) 47 cm, real inverted

(C) 34 cm, real inverted

(D) 53 cm, real inverted

Q29. A ball is dropped from height 90 m. Its velocity just before hitting the ground is:

(A) 35.8 m/s

(B) 28.3 m/s

(C) 35.0 m/s

(D) 32.6 m/s

Q30. The current through a 26 ohm resistor connected to a 7 V battery is:

(A) 4.61 A

(B) 4.78 A

(C) 2.28 A

(D) 3.78 A

Q31. A solenoid of 409 turns and length 0.2 m carries current 5 A. The magnetic field inside is:

(A) 1.81 mT

(B) 3.92 mT

(C) 19.86 mT

(D) 5.94 mT

Q32. A wire of resistance 11 ohm is bent into a circle. Effective resistance between diametrically opposite points is:

(A) 7 ohm

(B) 2 ohm

(C) 3 ohm

(D) 4 ohm

Q33. In photoelectric effect, the stopping potential for light of wavelength 324 nm on a metal with work function 3.1 eV is:

(A) 2.36 V

(B) 3.23 V

(C) 0.94 V

(D) 2.24 V

Q34. A wire of resistance 19 ohm is bent into a circle. Effective resistance between diametrically opposite points is:

(A) 6 ohm

(B) 2 ohm

(C) 8 ohm

(D) 8 ohm

Q35. An ideal gas at 292 K is heated at constant pressure to 489 K. The ratio of final to initial volume is:

(A) 2.1

(B) 2.3

(C) 2.1

(D) 2.7

Q36. A projectile is launched at 45 degrees with initial velocity 36 m/s. The time of flight is approximately:

(A) 1.6 s

(B) 2.4 s

(C) 2.5 s

(D) 4.3 s

Q37. Light passes from glass (n=1.5) to air. The critical angle is:

(A) 47 degrees

(B) 39 degrees

(C) 40 degrees

(D) 41 degrees

Q38. The focal length of a concave mirror is 29 cm. An object at 21 cm forms image at:

(A) 52 cm, real inverted

(B) 20 cm, real inverted

(C) 37 cm, real inverted

(D) 43 cm, real inverted

Q39. A Carnot engine operates between 781 K and 324 K. Its efficiency is:

(A) 51%

(B) 54%

(C) 28%

(D) 60%

Q40. A projectile is launched at 45 degrees with initial velocity 22 m/s. The time of flight is approximately:

(A) 3.9 s

(B) 4.6 s

(C) 2.9 s

(D) 3.3 s

Answer Key

Q1: (D)	Q2: (D)	Q3: (D)	Q4: (A)	Q5: (A)
Q6: (A)	Q7: (B)	Q8: (B)	Q9: (B)	Q10: (D)
Q11: (C)	Q12: (A)	Q13: (A)	Q14: (B)	Q15: (C)
Q16: (B)	Q17: (C)	Q18: (D)	Q19: (A)	Q20: (B)
Q21: (C)	Q22: (C)	Q23: (A)	Q24: (A)	Q25: (A)
Q26: (B)	Q27: (D)	Q28: (B)	Q29: (C)	Q30: (C)
Q31: (C)	Q32: (B)	Q33: (D)	Q34: (C)	Q35: (D)
Q36: (B)	Q37: (D)	Q38: (D)	Q39: (C)	Q40: (B)