

FREE SAMPLE: THE FIRST 3 QUESTIONS

NEET-UG — 180 QUESTIONS

Physics 45 · Chemistry 45 · Biology 90 · 720 marks · 180 minutes

Attempt all questions. A wrong answer loses 1 mark, so choose carefully.

Physics — 45 questions

Every question has four options and one correct answer. Correct +4, wrong -1, unanswered 0.

1. A quantity is calculated as $Z = A B^2 / C$. The percentage errors in measuring A, B and C are 4%, 1% and 1% respectively. Find the maximum percentage error in Z.

- A 4
- B 5
- C 6
- D 7

2. A boat can row at 13 m/s in still water. It crosses a river 100 m wide, heading straight across (perpendicular to the bank). The river flows at 5 m/s. Find the time taken to cross.

- A 5.56 s
- B 7.18 s
- C 7.69 s
- D 8.33 s

3. A particle moves in a circle of radius 4 m, making 60 revolutions per minute. Find the magnitude of its centripetal acceleration.

- A 25.1 m/s²
- B 158 m/s²
- C 14400 m/s²
- D 9.87 m/s²

THE WORKED ANSWERS TO THOSE 3 QUESTIONS

1. A quantity is calculated as $Z = A B^2 / C$. The percentage errors in measuring A, B and C are 4%, 1% and 1% respectively. Find the maximum percentage error in Z. [Units and measurements]

Correct answer: D — 7

- For a product or quotient, the fractional errors add after being multiplied by the powers: $\Delta Z/Z = 1\Delta A/A + 2\Delta B/B + 1\Delta C/C$.
- Percentage error = $1 \times 4 + 2 \times 1 + 1 \times 1 = 4 + 2 + 1$.
- Maximum percentage error = 7%.
- Why the other options are wrong:
 - A (4): Took only the largest contribution.
 - B (5): Subtracted the error of the quantity in the denominator; errors always add.
 - C (6): Forgot to multiply each error by the power of the quantity.

LOS: Physics · Units and measurements

KEY TAKEAWAY

Maximum percentage error = Σ (power $\times$ percentage error of each measured quantity).

2. A boat can row at 13 m/s in still water. It crosses a river 100 m wide, heading straight across (perpendicular to the bank). The river flows at 5 m/s. Find the time taken to cross. [Kinematics]

Correct answer: C — 7.69 s

- Heading straight across, the speed across the river is 13 m/s and the current only pushes the boat sideways.
- Time to cross = width / speed across = $\frac{100}{13} = 7.69$ s.
- Why the other options are wrong:
 - A (5.56 s): Added the current to the speed across.
 - B (7.18 s): Divided by the resultant speed.
 - D (8.33 s): Used the resultant speed or the wrong speed; the crossing time depends only on the component across the river.

LOS: Physics · Kinematics

KEY TAKEAWAY

Motion across the river and along the river are independent; the time to cross is width divided by the speed across.

3. A particle moves in a circle of radius 4 m, making 60 revolutions per minute. Find the magnitude of its centripetal acceleration. [Kinematics]

Correct answer: B — 158 m/s²

- Angular speed $\omega = 2\pi n/60 = 2\pi \times \frac{60}{60} = 6.28$ rad/s.
- Centripetal acceleration $a = \omega^2 r = (6.28)^2 \times 4 = 158$ m/s².
- Why the other options are wrong:
 - A (25.1 m/s²): That is the linear speed $v = \omega r$, not the acceleration.
 - C (14400 m/s²): Used revolutions per minute directly instead of converting to rad/s.
 - D (9.87 m/s²): Divided by r instead of multiplying: $a = \omega^2 r$.

LOS: Physics · Kinematics

KEY TAKEAWAY

Centripetal acceleration = $\omega^2 r = \frac{v^2}{r}$, with ω in rad/s.