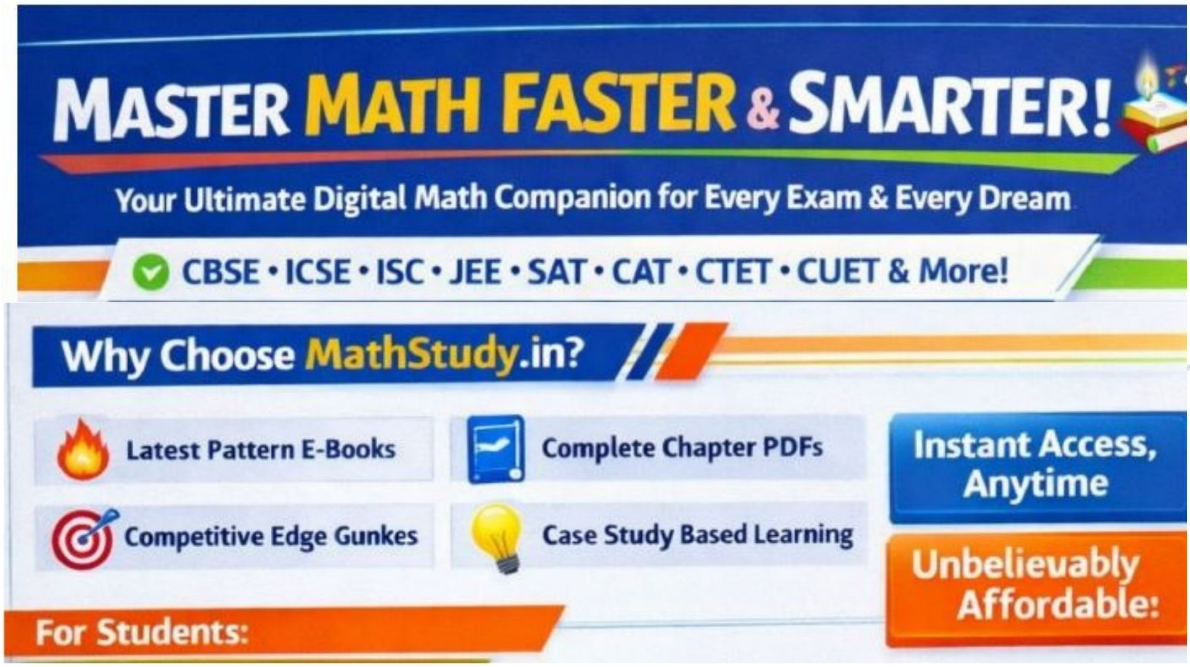
CUET Mathematics Test

Chapter: Numbers and Numerical Applications

SOLUTIONS

www.udgamwelfarefoundation.com

For Best Mathematics E-Books, Visit:
www.mathstudy.in



Special Features

- **Board-Specific** – CBSE, ICSE, ISC, State Boards
- **Exam-Focused** – JEE, SAT, CAT, CTET, CUET, NTSE
- **Grade-Wise** – Class 6 to 12
- **Bilingual Options** – English & Hindi Medium Support
- **Printable & Shareable** – Use offline, anytime

How to Order:

Visit : https://www.mathstudy.in
Browse by Exam, Class, or Topic
Add to Cart & Checkout

Contact & Support:

Email: admin@mathstudy.in
WhatsApp Support Available : +91-+91 92118 65759

Why Wait? Empower your learning journey, save time, and achieve your dreams!

Explore & Start Learning Today:
https://www.mathstudy.in – Premium eBooks for success
https://www.udgamwelfarefoundation.com – Free PDFs, practice tests, & guida

MathStudy.in — Empowering Learners, Enabling Educators, Encouraging Excellence.
Digital Learning | Affordable Excellence | Trusted by Thousands

Solutions

1. **Solution:** $37 = 5 \times 7 + 2$. Thus $37 \equiv 2 \pmod 7$. $x = 2$. **Correct Option: (B)**

2. **Solution:** We need $3^{2024} \pmod{10}$. $3^1 \equiv 3$, $3^2 \equiv 9$, $3^3 \equiv 7$, $3^4 \equiv 1 \pmod{10}$. Since 2024 is divisible by 4, $3^{2024} \equiv (3^4)^{506} \equiv 1^{506} \equiv 1 \pmod{10}$. **Correct Option: (A)**

3. **Solution:** Let milk $= 5k$, water $= k$. After adding 5L water: $5k/(k+5) = 5/2$. $10k = 5k + 25 \implies 5k = 25 \implies k = 5$. Milk $= 5(5) = 25$. **Correct Option: (B)**

4. **Solution:** By Alligation rule: Ratio of cheaper to dearer $= (72-64) : (64-62) = 8 : 2 = 4 : 1$. **Correct Option: (B)**

5. **Solution:** Downstream speed $= 13 + 4 = 17$ km/h. Time $=$ Distance/Speed $= 68/17 = 4$ hours. **Correct Option: (B)**

6. **Solution:** Downstream speed $= 8$ km/h, Upstream speed $= 4$ km/h. Let distance be d. $d/8 + d/4 = 3 \implies (d + 2d)/8 = 3 \implies 3d = 24 \implies d = 8$ km. **Correct Option: (A)**

7. **Solution:** Combined rate $= 1/20 + 1/30 = (3+2)/60 = 5/60 = 1/12$. Time $= 12$ hours. **Correct Option: (B)**

8. **Solution:** In 5 mins, A and B fill $5(1/12 + 1/15) = 5(9/60) = 45/60 = 3/4$ of the tank. When C opens, net rate $= 1/12 + 1/15 - 1/6 = (5 + 4 - 10)/60 = -1/60$. Tank empties at rate $1/60$ per min. Time to empty $3/4$ tank $= (3/4)/(1/60) = 45$ mins. **Correct Option: (C)**

9. **Solution:** When A covers 100m, B covers 90m. Ratio $A : B = 100 : 90$. When B covers 100m, C covers 90m. Ratio $B : C = 100 : 90$. $A : C = (A/B) \times (B/C) = (100/90) \times (100/90) = 100/81$. A beats C by $100 - 81 = 19$m. **Correct Option: (B)**

10. **Solution:** $A = 100, B = 80, C = 72$. In a race where B scores 80, C scores 72. If B scores 100, C scores $(72/80) \times 100 = 90$. B can give C $100 - 90 = 10$ points. **Correct Option: (B)**

11. **Solution:** $3x - x < 7 + 5 \implies 2x < 12 \implies x < 6$. Since $x \in \mathbb{N}$, $x \in \{1, 2, 3, 4, 5\}$. **Correct Option: (A)**

12. **Solution:** Adding/Subtracting same value c preserves inequality. $a < b \implies a - c < b - c$. **Correct Option: (C)**

13. **Solution:** $2^3 = 8 \equiv 1 \pmod 7$. $2^{100} = (2^3)^{33} \cdot 2^1 \equiv 1^{33} \cdot 2 \equiv 2 \pmod 7$. **Correct Option: (B)**

14. **Solution:** A's time $= 190$s, B's time $= 200$s. In 190s, A covers 1000m. In 190s, B covers $(1000/200) \times 190 = 950$m. A beats B by $1000 - 950 = 50$m. **Correct Option: (B)**

15. **Solution:** Let $A = 4k, B = k$. Total $= 5k$. After 10L mixture removed: $A = 4k - 8, B = k - 2$. Add 10L B: $B = k + 8$. Ratio $(4k-8)/(k+8) = 2/3 \implies 12k - 24 = 2k + 16 \implies 10k = 40 \implies k = 4$. Original $A = 4(4) = 16$. **Correct Option: (A)**

16. **Solution:** Half tank filled in 3 hours. Remaining half (3 hours worth) shared by 4 taps. Time for remaining half $= 3/4$ hours $= 45$ mins. Total time $= 3$ hours 45 mins. **Correct Option: (B)**

17. **Solution:** Downstream speed $= 10.5$, Upstream speed $= 7.5$. Total time $= 105/10.5 + 105/7.5 = 10 + 14 = 24$ hours. **Correct Option: (D)**

18. **Solution:** $13x \equiv 2x \pmod{11}$. $2x \equiv 5 \equiv 16 \pmod{11} \implies x \equiv 8 \pmod{11}$. **Correct Option: (B)**

19. **Solution:** In 4 mins, they fill $4(1/15 + 1/20) = 4(7/60) = 28/60 = 7/15$. Remaining $= 8/15$. B fills this in $(8/15)/(1/20) = 160/15 = 10$ mins 40s. Total time $= 4$ mins $+10$ mins 40s $= 14$ mins 40s. **Correct Option: (D)**

20. **Solution:** $x > 7$ and $x < 13$. $x \in \{8, 9, 10, 11, 12\}$. Total 5 values. **Correct Option: (B)**