

**QUICK DRILL · CBSE CLASS 11**

# Numbers, Quantification and Numerical Applications

Applied Mathematics · Chapter 1 · 15 MCQs · 20 minutes · PYQ-tagged with time budgets

DATE	TOTAL MARKS 15	DURATION 20 min	MARKING +1 / 0	TARGET ≥ 12/15
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**OBJECTIVES**

Reinforce the four core topics of Numbers, Quantification and Numerical Applications via 15 PYQ-derived MCQs. Identify weak sub-topics via concept-node IDs (see answer key). Build per-question time budget habit.

**INSTRUCTIONS**

Attempt all 15. Time budget shown per Q (use it as pacing guide). Mark answers (A/B/C/D) in the margin. Answer key + explanations on the last page. **Don't peek — score yourself honestly.**

**SECTION · QUICK DRILL**

Q 1-15 · 20 MIN

**Q1.** The decimal number 13 written in binary is:

- (A) 1011  
(C) 1110

- (B) 1101  
(D) 1001

PYQ 2023 · CBSE SQP · 2m · 40s

**Q2.** The binary number  $101101_2$  in decimal is:

- (A) 35  
(C) 45

- (B) 41  
(D) 53

PYQ 2024 · CBSE SQP · 2m · 40s

**Q3.**  $\log 8 + \log 25 - \log 2$  (base 10) equals:

- (A) 1  
(C) 3

- (B) 2  
(D)  $\log 31$

PYQ 2023 · CBSE SQP · 3m · 45s

**Q4.** Which of the following is FALSE?

- (A)  $\log(ab) = \log a + \log b$   
(C)  $\log(a + b) = \log a + \log b$

- (B)  $\log(a/b) = \log a - \log b$   
(D)  $\log(a^n) = n \log a$

PYQ 2022 · Annual Pattern · 1m · 30s

**Q5.** If  $\log 2 = 0.3010$ , then  $\log 8$  (base 10) equals:

- (A) 0.6020  
(C) 0.2408

- (B) 0.9030  
(D) 2.4080

PYQ 2024 · Annual Pattern · 2m · 35s

**Q6.** Simplify:  $2^{(3/2)} \cdot 2^{(1/2)}$ .

- (A) 2  
(C)  $2^{(3/4)}$

- (B) 4  
(D) 8

PYQ 2022 · CBSE SQP · 2m · 30s

**Q7.** If today is Monday, the day after 80 days will be:

- (A) Tuesday  
(C) Thursday

- (B) Wednesday  
(D) Friday

PYQ 2023 · Annual Pattern · 2m · 35s

**Q8.**  $23 \equiv ? \pmod{5}$

- (A) 0  
(C) 2

- (B) 1  
(D) 3

PYQ 2021 · CBSE SQP · 1m · 20s

**Q9.** Two grades of rice priced at Rs 40/kg and Rs 60/kg are mixed to give a mixture at Rs 52/kg. The ratio (cheaper : dearer) is:

- (A) 1 : 3  
(C) 3 : 2

- (B) 2 : 3  
(D) 8 : 12

PYQ 2023 · Annual Pattern · 3m · 40s

**Q10.** A 40-litre cask of pure milk has 8 litres replaced by water once. The pure milk now left is:

- (A) 30 litres  
(C) 34 litres

- (B) 32 litres  
(D) 36 litres

- Q11.** A boat travels 30 km downstream in 2 hours and the same distance upstream in 3 hours. The boat's speed in still water is:
- (A) 10 km/h (B) 12.5 km/h  
(C) 15 km/h (D) 25 km/h

PYQ 2022 · CBSE SQP · 3m · 45s

- Q12.** Pipe A fills a tank in 4 hours; a leak empties it in 12 hours. With both open, the tank fills in:
- (A) 6 hours (B) 8 hours  
(C) 12 hours (D) 16 hours

PYQ 2023 · CBSE SQP · 3m · 45s

- Q13.** Two pipes fill a tank in 6 hours and 4 hours respectively. Together they fill it in:
- (A) 2 hours (B) 2.4 hours  
(C) 5 hours (D) 10 hours

PYQ 2024 · Annual Pattern · 2m · 35s

- Q14.** In a 100-metre race, A beats B by 20 metres. The ratio of speeds A : B is:
- (A) 5 : 4 (B) 4 : 5  
(C) 5 : 6 (D) 6 : 5

PYQ 2021 · Annual Pattern · 2m · 30s

- Q15.** The average of the first 5 natural numbers (1, 2, 3, 4, 5) is:
- (A) 2.5 (B) 3  
(C) 3.5 (D) 15

PYQ 2022 · Annual Pattern · 1m · 20s

## ANSWER KEY & EXPLANATIONS

Q 1-15 · MARK YOUR SCORE

**Q1. Answer: B**

$13 \div 2 = 6$  r1,  $6 \div 2 = 3$  r0,  $3 \div 2 = 1$  r1,  $1 \div 2 = 0$  r1. Reading remainders bottom-to-top: 1101. Check:  $1 \cdot 8 + 1 \cdot 4 + 0 \cdot 2 + 1 \cdot 1 = 13$ .

**Q2. Answer: C**

$1 \cdot 32 + 0 \cdot 16 + 1 \cdot 8 + 1 \cdot 4 + 0 \cdot 2 + 1 \cdot 1 = 32 + 8 + 4 + 1 = 45$ .

**Q3. Answer: B**

$\log((8 \times 25)/2) = \log(200/2) = \log 100 = \log 10^2 = 2$ .

**Q4. Answer: C**

There is no sum law for logarithms.  $\log(a + b)$  does NOT equal  $\log a + \log b$ . The other three are valid laws.

**Q5. Answer: B**

$\log 8 = \log 2^3 = 3 \cdot \log 2 = 3 \times 0.3010 = 0.9030$  (power law).

**Q6. Answer: B**

Same base, multiplying  $\Rightarrow$  add exponents:  $3/2 + 1/2 = 2$ . So  $2^2 = 4$ .

**Q7. Answer: C**

$80 = 7 \times 11 + 3$ , so  $80 \equiv 3 \pmod{7}$ . Three days after Monday: Tue, Wed, Thu  $\rightarrow$  Thursday.

**Q8. Answer: D**

$23 = 4 \times 5 + 3$ , so  $23 \equiv 3 \pmod{5}$ .

**Q9. Answer: B**

$(D-M) : (M-C) = (60-52) : (52-40) = 8 : 12 = 2 : 3$ .

**Q10. Answer: B**

Pure milk =  $40 \cdot (1 - 8/40)^1 = 40 \cdot (4/5) = 32$  litres.

**Q11. Answer: B**

Downstream =  $30/2 = 15$  km/h; upstream =  $30/3 = 10$  km/h; boat =  $(15 + 10)/2 = 12.5$  km/h.

**Q12. Answer: A**

Combined rate =  $1/4 - 1/12 = 3/12 - 1/12 = 2/12 = 1/6$  per hour. Time = 6 hours.

**Q13. Answer: B**

Combined rate =  $1/6 + 1/4 = 2/12 + 3/12 = 5/12$  per hour. Time =  $12/5 = 2.4$  hours.

**Q14. Answer: A**

Speed ratio A : B =  $100 : (100 - 20) = 100 : 80 = 5 : 4$ .

**Q15. Answer: B**

Average =  $(1+2+3+4+5)/5 = 15/5 = 3$ .