Mathematics — Ganita Manjari

Chapter 13 Test 8

Two Variables, One Line

Class IX | 2026–27

Time Allowed: 45 Minutes | Maximum Marks: 25

General Instructions

1. All 13 questions are compulsory. Choose one option in A; show working in B–D.
2. No calculators. Give exact answers unless an approximation is requested.
3. Read the scales on graphs carefully. Other diagrams are not necessarily to scale.

SECTION A

(5 questions × 1 mark = 5 marks)

1. A taxi charges ₹30 plus ₹12 per kilometre. What does ₹30 represent?

(A) Fixed charge
(B) Charge per kilometre
(C) Total for one kilometre
(D) Maximum fare

2. Using $F = \frac{9}{5}C + 32$, a rise of 10°C produces a Fahrenheit rise of:

(A) 10°F
(B) 32°F
(C) 18°F
(D) 50°F

3. A tank has no outlet. When its tap is turned off, its water-volume graph becomes:

(A) A falling line
(B) A vertical line
(C) A steeper rising line
(D) A horizontal line

4. Plans A and B cost ₹$(80 + 2t)$ and ₹$(50 + 3t)$ for t minutes. B's bill increases how much faster per minute?

(A) ₹0
(B) ₹1
(C) ₹2
(D) ₹3

5. A cooling rule is $T = 60 - 3t$, with t in minutes and T in °C. The temperature falls each minute by:

(A) 3°C
(B) −3°C
(C) 20°C
(D) 60°C

SECTION B

(4 questions × 2 marks = 8 marks)

6. Two taxi rides differ by 4 km and ₹52, with the same fixed charge and constant kilometre rate. Find the rate and charge for 7 additional kilometres.

7. A tank contains 120 L. One pipe fills 8 L/min while another drains 3 L/min. Express volume V after t minutes and find when it reaches 200 L.

8. A library charges a fixed amount for the first three days and an additional daily charge thereafter. Use the table to find both charges.

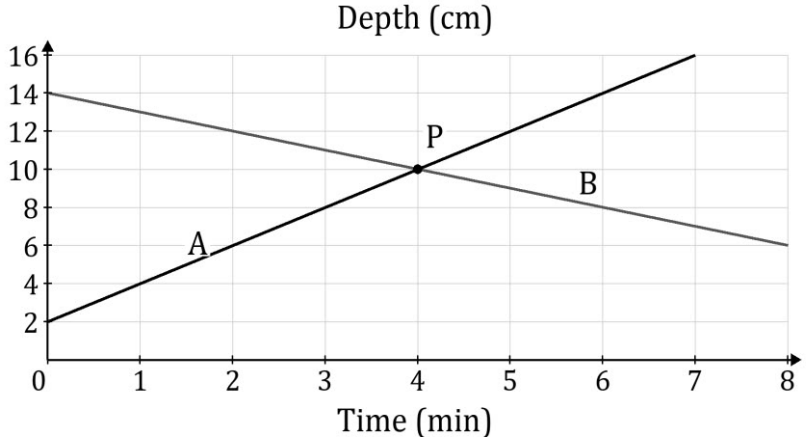
Days kept	Charge (₹)
5	21
8	33

9. A prepaid balance falls from ₹170 to ₹122 during 12 minutes of calling. At the same rate, how many more minutes reduce it to ₹50?

SECTION C

(3 questions × 3 marks = 9 marks)

10. The water-depth models of tanks A and B are shown in figure. Find when their depths are equal, the common depth, and which tank is deeper one minute later.



11. The scales obey $F = \frac{9}{5}C + 32$. Find the temperature at which the Fahrenheit reading is twice the Celsius reading, and verify both readings.

12. Monthly plans A and B cost ₹$(60 + 1.5t)$ and ₹$(90 + t)$ for t calling minutes. When does A cost ₹15 more than B? Find both bills.

SECTION D

(1 application question × 3 marks = 3 marks)

13. Two printers together print 450 pages in 10 minutes. One prints 5 more pages per minute than the other. Find their rates and the slower printer's time for 200 pages.