

12. (a) The area of each of the longer walls of a room is 360 feet, that of each of the other walls is 192 feet, and that of the floor is 480 feet. How many yards (linear) of paper, 18 inches wide, will be needed for the walls, deducting one-twenty-fifth of the whole area for doors, etc.

(b) Find the depth of a ditch, the transverse section of which is a trapezoid, of which the longer side is 20 feet, the slopes of the sides 2 in 1 and 3 in 1 respectively, and the area 146.25 square feet.

12. (a) Since the area of the walls is 1114 square feet, the number of yards of paper required =

$$\frac{24}{25} \times 1114 \times \frac{2}{3} \times \frac{1}{3} = 237.653 \text{ yards.}$$

(b) Denote the depth by d . Then proceeding $\frac{1}{3}d$ from one side of the ditch and $\frac{1}{2}d$ from other side, along the top we see

that width of bottom of the ditch = $20 - \frac{5}{6}d$.

$\therefore$ the area of the transverse section

$$= \frac{1}{2}d \left\{ 40 - \frac{5}{6}d \right\} = 146\frac{1}{2}.$$

$\therefore d=9$ or 39 ft. An examination of the latter value shews it inadmissible.

Second Class Teachers.

ARITHMETIC.

Examiner—J. J. Tilley.

NOTE.—Eight questions will be considered a full paper, but the 5th and 10th must be taken.

1. A man bought a house which cost him 4 per cent. on the outlay to put it in repair; it remained empty for a year, during which time he reckoned he was losing 5 per cent. on his total outlay. He then sold it for \$1192, which paid for repairs and loss and also gave a profit of 10 per cent. on the cost price of the house. Find the cost price.

Ans. \$1000. [25.]

2. A railway train moving with uniform speed is met and passed in 5 seconds by an engine and tender 30½ feet long and running

30 miles an hour; the engine and tender return shortly afterwards and pass the train in 25 seconds after overtaking it. Find the length of the train. Ans. 336 ft. [25.]

3. A person invested \$8420 in 8 per cent. stock on the 7th day of January at 109½, and on the 12th day of February of the same year sold it out at 117½, paying ½ per cent. brokerage on each transaction. Find his gain per cent. on what the stock cost him—money being worth 8 per cent. per annum (360 days). Ans. 6.906 per cent., interest being deducted. [25.]

4. A merchant bought 3885 yards of cloth and marked it at an advance of 33½ per cent. on cost; in selling the first half of it he gave only 35 inches for a yard, but in selling the remainder he gave 37 inches for a yard. He gained on the whole transaction \$3897. What did the cloth cost him per yard?

Ans. \$3.00. [25.]

5. I bought French goods for 7490 francs, and paid an import *ad valorem* duty of 15 per cent. I sold the goods for £420. Find my gain or loss in dollars and cents if the £ = fr. 25.22 = \$4.87.

Ans. \$382.1294. [20.]

6. I invested in 7 per cent. stock at 78½. and having received a half year's dividend I sold out at 79½, paying ½ per cent. brokerage on each transaction, and increased my capital altogether by \$292.50. How much did I invest? Ans. \$5086.25. [25.]

7. In an election 15 per cent. of the constituency refused to vote; of two candidates, one received 45 per cent. of the votes in the constituency and was elected by a majority of 150. Find the number of votes cast for each. Ans. 1200 and 1350 votes. [25.]

8. A person bought a quantity of goods for \$224, payable in 2 months, and sold them at once for \$274, payable in 4 months. Find the gain in ready money allowing trade discount at 6 per cent. per annum.

Ans. \$46.76. [25.]

9. A, B and C walk from P to Q each at a uniform rate, A's rate being equal to ⅔ of C's, and B's rate was 4 miles an hour. B started 45 minutes after A, and C started