Six questions may be answered.

Mathematical Tables may be obtained from the Superintendent.

1. Goods purchased at £18 10s. 6d. per ton were sold at 3½d. per lb. Expenses amounted to 20% of the selling price: find the percentage profit. [30 marks]

2. Using logarithms, find the amount at Compound Interest of £480 for 18 years at 4½% per annum. [30 marks]

3. A watch which gains uniformly was 2½ mins. slow at noon on Sunday and on the following Friday at 7 hrs. 12 mins. a.m. it was 3½ mins. fast. When did it show correct time? [30 marks]

4. Find to two significant figures the square root of

\[
\frac{(60.38)^2 - (58.79)^2}{(90.38)^2 - (58.79)^2}
\]

[30 marks]

5. P and Q ran a race of 100 yards. P got a start of 2 seconds and won by 17 yards. In a second race over the same course P got a start of 1 second and won by 8 yards. Find the time it takes each of them to run a hundred yards. [30 marks]

6. By selling out £3,600 of 3½% Stock at 80½ and investing the proceeds in 4½% Stock a man’s income was increased by £2:5s. per annum. What price did he pay for the 4½% Stock? [35 marks]
7. Three solid spheres of the same material are 1.5 ins., 2 ins., 2.5 ins. respectively in radii and the smallest weighs 5.4 lbs. If all three be recast into a single solid sphere, what will be its weight and the length of its radius?

[35 marks.]

8. Without applying the usual method for extracting the square root prove that the following numbers are not perfect squares:
   (i) 54,874,683, (ii) 3,629,475, (iii) 1,682,769.

   The number 3.838,764 is a perfect square: find the missing digit (*).

[35 marks.]

9. Two right circular cones whose vertices are A and B stand on opposite sides of the same base: their slant heights are 13 ins. and 5 ins. respectively and the distance AB is 14.4 ins. Find the total volume enclosed by the surfaces of the two cones.

[35 marks.]