

4. In how many relations may a substantive clause stand in a sentence? Give an example of each relation.

5. Distinguish between verbs of complete and incomplete predication.

6. Define *strong conjugation*, *transitive verb*, *auxiliary verb*, *do-factive verb*.

7. Criticise the following sentences, making corrections where necessary:—

He is a better philosopher than a statesman.

Every one to their own taste.

The winter has not been as severe as we expected it to have been.

Two is better than one.

Wheat is being sold for a dollar a bushel.

Enjoying health and to live in peace are great blessings.

Values—1 (a) 20, (b) 20; 2, 6; 3, 12; 4, 12; 5, 8; 6, 8; 7, 14. Total—100.

GEOGRAPHY.

1. Explain the phenomena of the tides.

2. What is the position of the earth's axis with reference to the plane of its orbit, and what are the chief consequences of that position?

3. Name the thirteen original states of the American Union with their capitals.

4. Trace the course of the Danube, naming its tributaries and the countries drained by it.

5. Name and locate the possessions of France in the different parts of the world.

6. Locate the following islands and tell the Government to which each belongs:—Cyprus, Cronstadt, Corfu, Elba, Sark, Nippon, Singapore, San Juan, Trinidad, Miquelon.

7. Draw a map of the Mediterranean Sea, marking the countries on its shores and the courses of the principal rivers that flow into it. Show by a double dotted line the boundaries of the Roman Empire at the time of its greatest extent.

Values—1, 5; 2, 10; 3, 20; 4, 5; 5, 5; 6, 20; 7, 5. Total—70.

HISTORY.

1. Where and when and between what armies was each of the following battles fought:—Marathon, Zama, Actium, Chrlons, Naseby, Trafalgar, Jena, Austerlitz, Waterloo, Balaclava?

2. Attach an important historical event to 1096, 1215, 1453, 1513, 1535, 1587, 1665, 1759, 1821, 1867.

3. What led to the establishment of representative government in England?

4. When did the following eminent personages live, and for what are they respectively famous:—Miltiades, Lysander, Hannibal, Cleopatra, Caractacus, Boadicea, Charlemagne, Warren Hastings, Amherst, Bonaparte?

5. Enumerate the evils which the Confederation of the British North American Provinces was designed to remedy.

6. What do you understand by "Home Rule" for Ireland?

Values—Ten each.

ALGEBRA AND GEOMETRY.

1. What is the dimension of a term? When is an algebraical expression said to be homogeneous?

2. Resolve $x^{20} - x^{10}$ into six elementary factors.

3. Solve the following equations:—

$$\frac{x-7}{x+7} = \frac{2x-15}{2x-6} - \frac{1}{2(x+7)};$$

$$\frac{(2x+3)x}{2x+1} + \frac{1}{3x} = x+1,$$

4. There is a number of two digits, whose difference is 2, and, if it be diminished by half as much again as the sum of the digits, the digits will be inverted. Find it.

5. Triangles upon the same base and between the same parallels, are equal to one another. Prove.

6. The greater side of every triangle is opposite to the greater angle. Prove.

7. Define semicircle, polygon, scalene triangle, trapezium, hypothesis.

Values—1, 8; 2, 8; 3, 10+10; 4, 14; 5, 10; 6, 10; 7, 5.

Practical Department.

LESSONS IN CHEMISTRY.

(Continued from last month.)

CHAPTER II.

EXERCISE II.

33. What is meant by an *acid*, an *alkali*, a *salt*? give the tests.

34. Estimate the weight of the oxygen in a barrel of water, 63 gallons, given 1 gallon = 10 lbs.

35. Draw the line separating simple from compound bodies.

36. Write out from memory a table of the non-metals.

(1) in alphabetical order (2) in the order of their atomic weights.

37. How many grams of potassic chlorate will yield 192 grams of oxygen? 490

38. How many pounds of zinc will be required to generate 20 lbs of hydrogen from sulphuric acid? given the formula $\text{H}_2\text{SO}_4 + \text{Zn} = \text{ZnSO}_4 + \text{H}_2$. 652

39. Find the percentage of oxygen in hydric sulphate.

65.714

40. What is the formula for a compound having the percentage composition O=72.73, C=27.27? CO_2 . N.B. $(72.73 \div 16) : (27.27 \div 12) :: \text{O} : \text{C}$. The slight discrepancy from 1:2 is owing to error in the experimental determination of the 27.27.

41. Give the formula for a substance containing K=31.837, Cl=29 and O=39.183 KClO_3

42. Give the percentage composition of ammoniac chloride NH_4Cl . N=26.17, H=7.476, Cl=66.355.

43. Nitric acid is made by distilling saltpetre (KNO_3) with hydric sulphate, H_2SO_4 , given the formula $\text{KNO}_3 + \text{H}_2\text{SO}_4 = \text{HNO}_3 + \text{HKSO}_4$ (hydric potassic sulphate) find how much acid 300 grams of nitre or saltpetre will produce. 187.1

44. Name the substances represented by the formulas MnO_2 , NH_4Cl , Fe_3O_4 , P_2O_5 , ZnSO_4 , CaCO_3 and mention any experiments in which they occur. (2nd Class 1876).

45. Find the weight of carbonic acid produced by burning 5 grs. of carbon in oxygen 18.3. (do 1877)

46. How much phosphorus is contained in 120 lbs of bone-ash consisting of 88.4 per cent of tricalcic phosphate and 11.5 per cent of calcic carbonate? (do. 1879). Ans 21.216.

47. How many lbs of charcoal (carbon) in a barrel of pure sugar, 300 lbs? 126.3.

48. How many pounds of zinc in 350 lbs of zinc sulphate? Ans. 141.3 (2nd Class 1877)

49. Name all the substances represented in the equation $\text{HNO}_3 + \text{HKO} = \text{KNO}_3 + \text{H}_2\text{O}$.

50. If 200 grams of the first substance be used how much of the last named substance will be produced? 57.14

51. Name the substances in the formula $2\text{NH}_4\text{Cl} + \text{CaH}_2\text{O}_2 = 2\text{NH}_3 + \text{CaCl}_2 + 2\text{H}_2\text{O}$. What weight of the first will produce 1 kilogram (=1000 grams) of the third? Ans. 53.5 yield 17 hence 3147 yield 1000.

52. Name the substances in the equation $\text{Na}_2\text{CO}_3 + 2\text{HCl} = 2\text{NaCl} + \text{H}_2\text{O} + \text{CO}_2$.

53. Bleaching powder and sulphuric acid produce calcic sulphate, water, and chlorine. Represent the reaction by an equation.

54. One part of manganic dioxide and two parts each of sulphuric acid and common salt yield sodic sulphate, manganous sulphate (MnSO_4), two parts of water and two of chlorine. Express this symbolically.