

Examination Papers.

JULY EXAMINATIONS, 1885.

THIRD CLASS.

PHYSICS.

Examiner—J. C. GLASHAN.

1. Define: Matter, body, solid, liquid, gas.

What is meant by saying that ice, water and steam are three states of one and the same substance? What is the chief determining condition of each state?

2. Define 'mass,' 'volume' and 'density,' and state the relation that holds among them.

How is the mass of a body generally measured?

A body loses in weight as it is carried from a high to a low latitude; what effect has this on its mass? If the body were to increase in volume while it lost in weight through removal towards the equator, what would be the effect on its mass and what on its density?

3. Define 'force' and 'energy,' clearly distinguishing between them.

"If it requires a strong force to set a body in motion, it requires also a strong force to stop it." (Stewart, p. 4.) Show that this is not true.

If a body having a velocity of 60 feet per second be acted upon by no force whatever, what will be its velocity at the end of 5 seconds?

4. What is the cause of sound? By what experiments could you prove this?

5. "Rapidly mix some melting ice or snow and some salt together, the mixture is colder than melting ice." What is the reason of this?

6. How can you magnify a near object? (Illustrate your explanation by a drawing.)

How can you magnify a distant object?

EUCLID.

Examiner—J. DEARNESS.

NOTE.—Symbols, except of operation, may be employed. Use capital letters on the diagrams. It is recommended that every step in the demonstration should begin on a new line.

1. What is a postulate?

The postulates permit or ask for the use of the ruler and compass; with what limitations?

To what class of "Propositions" do the 'axioms' and the 'postulates' respectively correspond?

2. "A theorem consists of the hypothesis and predicate, and requires demonstration." Explain this statement by reference to two propositions, one of them being "The greater side of every triangle is opposite to the greater angle." (I. 18.)

3. Draw a straight line at right angles to a given straight line from a point in the same. (I. 11.)

4. In the preceding, given the point at the end of the line, draw a line at right angles without producing the given line. (Apply I. 32.)

5. If from the ends of a side of a triangle there be drawn two straight lines to a point within the triangle, these shall be less than the other two sides of the triangle but shall contain a greater angle. (I. 21.)

6. In the preceding let ABC be the given triangle, D the given point within it, and AD, CD the lines drawn to D, show that the angle ADC is equal to the sum of the angles ABC, BAD and BCD.

7. The complements of the parallelograms which are about the diagonals of any parallelogram are equal to one another. (I. 43.)

8. If the square described upon one of the sides of a triangle be equal to the sum of the squares described upon the other two sides of it, the angle contained by these two sides is a right angle. (I. 48.)

9. Prove the correctness of these rules:

The area of a trapezoid is equal to half the product of its altitude by the sum of its parallel sides.

The area of a rhombus is equal to half the product of its diagonals.

10. If a perpendicular (AD) be drawn from the vertex (A) to the base (BC) of a triangle (or the base produced), then shall the sum of the squares on AB and DC be equal to the sum of the squares on AC and BD.

ENGLISH GRAMMAR.

Examiner—JOHN SEATH, B.A.

1. Describe in your own words, the function of the adjective, explaining clearly the meanings of the terms "describing," "qualifying" and "limiting," and applying your description to the adjectives in the following: The man, five boys, good men, his kind father is dead.

2. Explain in your own words the terms "Government" and "Agreement," and illustrate by reference to *all* the governing and agreeing words in the following: If need be, thou shalt see thy master's efforts to win these laurels.

3. Rewrite the following statements, making such corrections as you consider necessary, and assigning your reasons therefor:

(a) When a superlative is used, the class between which the comparison is made and which is introduced by *of* should always include the thing compared: as, "Bismarck is the greatest of German statesmen," or "Bismarck is the greatest German statesman."

(b) The sign *to* should not be used for a full infinitive unless the verb in the same form can be supplied from the preceding part of the sentence: as, "You never wrote me: you ought to" is wrong, since it is incorrect to say, "You ought to wrote."

(c) The perfect infinitive is used when the act spoken of is regarded as completed before the time expressed by the governing verb: as, "I hoped to have gone before the meeting."

4. Distinguish the meanings of:

(a) 'If he go, I shall go,' and 'If he goes, I go.'

(b) 'I think so, I do think so, I am thinking so,' and 'I should think so.'

(c) 'He shall go, He will go,' and 'He is about to go.'

(d) 'I knew that he speaks the truth,' and 'I knew that he spoke the truth.'

(e) 'Who did it?' and 'Which did it?'

5. Classify and give the syntax of the italicized words in the following:

(a) He is a fool *to sit alone*.

(b) *Much* to my surprise, he forgave *them* their fault.

(c) He is too old *to play* the fool.

(d) My dream last *night* came true.

(e) The *daughter* of a hundred earls, You are not one *to be desired*.

6. Classify the propositions in the following, giving their relation.

Because half a dozen grasshoppers under a fern make the field ring with their importunate chink, while thousands of great cattle reposing beneath the shadow of the British oak, chew the cud and are silent, pray do not imagine that those who make the noise are the only inhabitants of the field—that, of course, they are many in number—or that, after all, they are other than the little, shrivelled, meagre, hopping—though loud and troublesome—insects of the hour.

7. (a) Translate into a phrase each of the following: Sheep-dog, wood-work, railway, steam-boat.

(b) Translate into a compound each of the following: As dark as coal, that can keep in water, surrounded by the sea, tearing asunder the heart.

8. Correct any errors in the following, giving your reason in each case:

(a) These pronouns are indeclinable and used in the singular only.

(b) He looks like his mother does, but he talks like his father.

(c) He was afraid he would be burned.

(d) The references will be found useful to the junior student, and enable him to obtain an insight into the subject.

(e) A second division of lands followed and the poet was not only deprived of his estate; but barely escaped with his life when fleeing from the onset of his enemies.

(f) Trusting that you will remember us, and write as often as you can spare time, and with best love (in which we all heartily join) remember me as ever, &c.

(g) There are many boys whose fathers mothers died when they were infants.

(h) Shall you be able to sell them boots?

(i) Of all my rash adventures past This frantic freak must prove the last.

(j) Nor frequent does the bright oar break The darkening mirror of the lake, Until the rocky isle they reach, And moor their shallop on the beach.

On the birthday anniversary of John G. Whittier, the pupils of the junior class of the Girls' High School, of Boston, sent him seventy-seven choice roses. The class is now engaged in the study of his works. In reply the poet sent the following:

"The sun of life is sinking low;
Without, a winter's falling snow,
Within, your summer roses fall,
The heart of age your offering cheers,
You count in flowers my many years—
God bless you, one and all."