

3. (a) How would you conduct an experiment to show that the pitch of a sound depends only upon the rate of vibration of the sounding body?

(b) Account for the throbbing sensation produced when a tuning-fork is moved towards a near wall.

4. (a) State the laws of reflection of light.

(b) Describe some experiments by means of which they may be accurately verified.

5. (a) What is meant by the *principal focus* of a lens?

(b) Show how to place a condensing lens and a candle before an eye so that an erect magnified virtual image of the candle may be seen.

6. (a) Show by means of a carefully drawn diagram why a straight stick appears bent when partly immersed obliquely in water.

(b) Show that a convex spherical mirror always forms a diminished erect image of an object placed before it.

7. (a) Describe the construction of any common two-fluid cell.

(b) State any applications for which the cell described is peculiarly adapted.

8. (a) Name the essential parts of a simple telephonic circuit.

(b) Make a careful drawing of a telephone receiver, showing all its parts, and state the action of each part.

LATIN GRAMMAR AND COMPOSITION.

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1. Write down the ablative singular of *omnis obse*, the genitive singular of *tota caedes*, the genitive plural of *proelium acris*, the positive and superlative of *celerius* and *magis*.

2. Write down the participles, naming them, of *cognosco*; the infinitives, naming them, of *fin*; the 3rd person plural of all tenses of the subjunctive active of *conseruo*; and the future indicative active, 1st singular of *transco*.

3. Explain clearly the mistake in translating

(a) "Having assembled the troops, he set out," by "Coptis conventis profectus est."

(b) "Having arrived there, he wrote to Labienus," by "Eo perventus ad Labienum scripsit,"

and rewrite the Latin in correct form.

4. Explain the construction of the italicized words in the following sentences:—

(a) *Celerius nostra opinione venit.*

(b) *Quaesivit quid in bello possent.*

(c) *Aegre eo die sustentatum est.*

(d) *Reperit Nervios nihil vini pati inferri.*

(e) *His persuaderi ut diutius morarentur non poterat.*

(f) *Numidas subsidio oppidanis mittit.*

(g) *Manipulos laxavit, quo facilius gladiis uti possent.*

(h) *Dat negotium Senonibus, uti ea quae apud eos gerantur cognoscant.*

(i) *Ad haec Caesar respondit: se civitatem conservaturum si prius quam aries murum attigisset se dedidissent.*

5. Translate into Latin:—

(a) After marching for ten days through their country he pitched his camp by a river.

(b) On the return of the cavalry to camp, while the auxiliaries were a good way off, word came that the enemy were approaching.

(c) There was no time even for putting on (*induo*) their helmets (*galea*). He had to do everything at once.

(d) Accordingly, drawing up his men and ordering the gates of the camp to be closed, he sent out a horseman to ascertain the number of the enemy.

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Translate:—

Ab his castris oppidum Remorum nomine . . . nisi subsidium sibi submittatur, sese diutius sustinere non posse.—Caesar B. ii., cap. 6.

1. Parse *nomine*, *coeperunt*, *defensoribus conicerent*, *oppido*, *submittatur*.

2. *Oppugnatio*. Compare the method here described with that in use among the Romans.

3. *Coepti sunt*. Why is the passive used here?

4. Derive *succedunt*, *subruunt*, *subsidium*, *submittatur*, *sustinere*, showing the exact meaning of the prefix in each word.