

PRELIM REVISION

03 SEPTEMBER 2013

Lesson Description

In this lesson, we:

- Take some tips on HOW to study for the exams.
- Tackle prelim examination questions

Key Concepts

How to study for Physics Prelims and Finals

The Physics Examination is split into four parts:

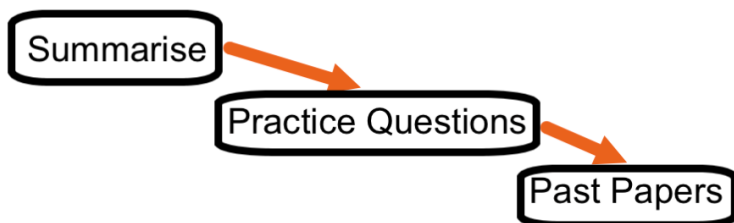
1. Mechanics (30%)
2. Matter and materials (Photoelectric effect) (10%)
3. Waves, Sound & Light (2D and 3D waves, EM) (30%)
4. Electricity and Magnetism (Electrodynamics, circuits) (30%)

How to study for Chemistry Prelims and Finals

The Chemistry Examination is split into three parts:

1. Matter and materials (Organic) (35%)
2. Chemical Change (Rates, Equilibrium, REDOX) (45%)
3. Chemical Systems (Batteries, Chlor-alkali) (20%)

Steps to Success in Physical Science



Examples

Hint: when you practice past papers, you start to see trends and important terms so keep your summaries close. Keep practicing. This will help you realise if there are gaps in understanding, then you can get help with those specific examples.

The following Questions are taken from the Eastern Cape Paper 1 – Trial Paper written on the 2nd September 2013

Question 1

Give ONE word/term for EACH of the following descriptions. Write only the WORD/TERM next to the question number (1.1–1.5).

- a.) The SI-unit of the quantity calculated by the product of force and velocity (1)
- b.) Electrical potential energy per unit charge (1)
- c.) The ability of a wave to spread out in wave fronts and thus bending around a sharp edge (1)
- d.) The spectrum that is produced when cooler vapour absorbs light of certain frequencies (1)
- e.) This phenomenon explains why electrons are emitted from a metal when light shines on it (1)

Question 2

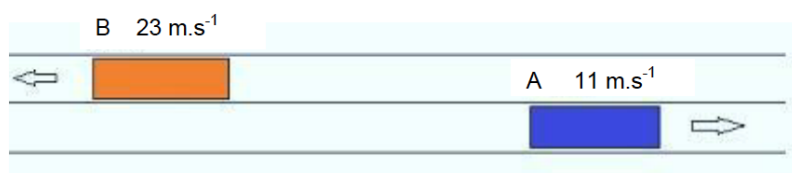
Four possible options are provided as answers to the following questions. Each question has only ONE correct answer. Choose the best answer and mark the correct letter (A–D) next to the question number (2.1–2.10).

2.1 When a projectile is moving vertically upwards it...

- A has zero acceleration
- B accelerates downwards with a constant acceleration
- C loses its mass
- D has maximum velocity at its highest point

(2)

2.2 Good train A travelling at a velocity of 11 m.s^{-1} east passes a goods train B travelling at 23 m.s^{-1} west on adjacent tracks as shown in the sketch below.



The magnitude and direction of the velocity of goods train A relative to B is...

- A 12 m.s^{-1} west
- B 34 m.s^{-1} west
- C 12 m.s^{-1} east
- D 34 m.s^{-1} east

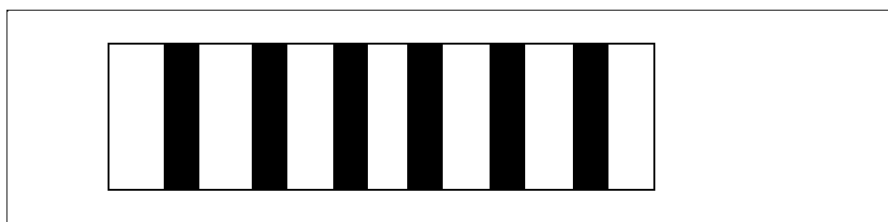
(2)

2.3 The quantity which REMAINS CONSTANT for an object falling to the ground is ... (Ignore air friction)

- A potential energy
- B kinetic energy
- C mechanical energy
- D momentum

(2)

Refer to the following diagram to answer 2.4 and 2.5



2.4 The above mentioned pattern shows equally spaced dark and bright bands. The experiment during which this is obtained is called ...

- A single slit diffraction
- B double slit diffraction
- C single slit interference
- D double slit interference

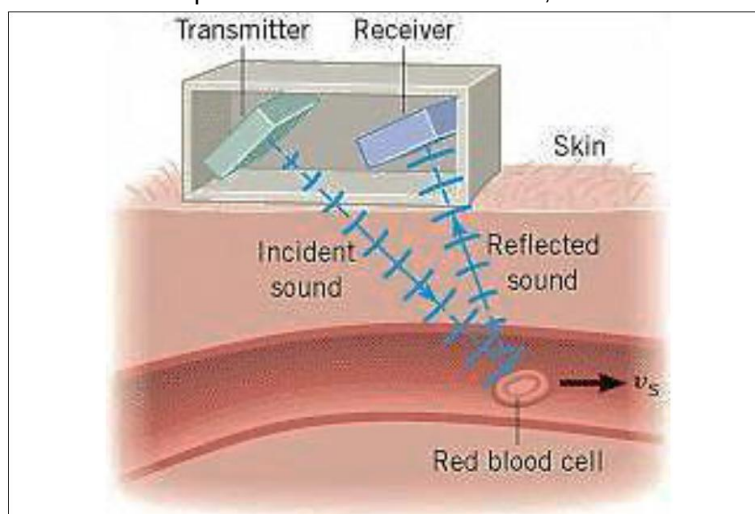
(2)

2.5 The above mentioned pattern provides evidence that light behaves as ...

- A particles
- B waves
- C both
- D neither

(2)

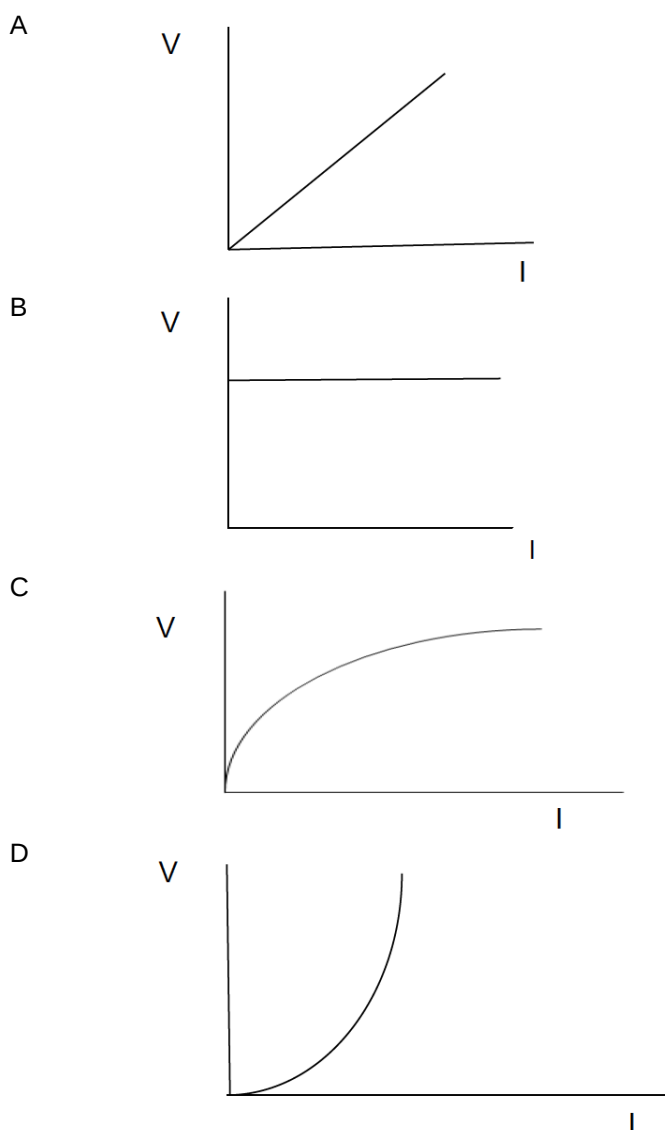
2.6 The device in the diagram is used to locate regions where blood vessels have narrowed. It is an application of a certain phenomenon in a certain field, such as...



- A reflection in astronomy
- B photoelectric effect in Life Sciences
- C Doppler effect in medicine
- D diffraction in transport and industry

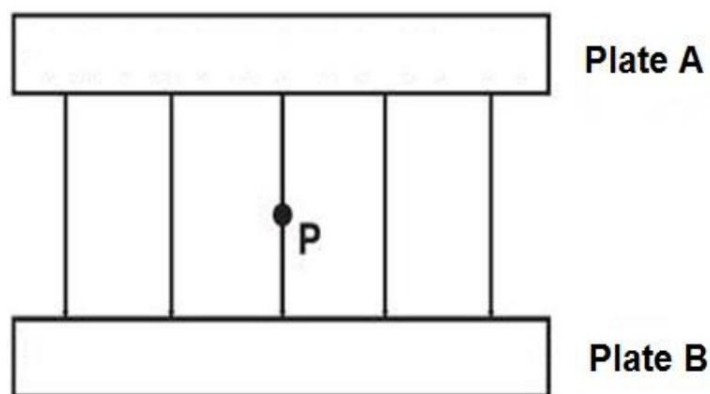
(2)

- 2.7 Which of the following graphs represents potential difference versus current for a non-ohmic conductor?



(2)

- 2.8

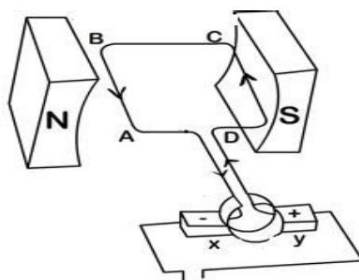


A POSITIVE test charge is placed in an electric field between parallel plates of a capacitor. The test charge moves from plate B to plate A. It can be concluded that...

- A plate A is positively charged
- B plate B is positively charged
- C plate B is a negatively charged
- D plate A is an insulator

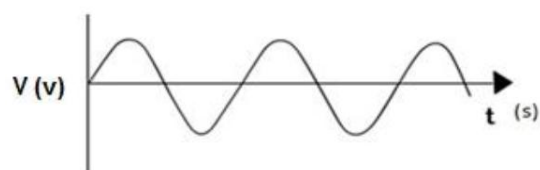
(2)

2.9 A simplified sketch of a generator is shown below.

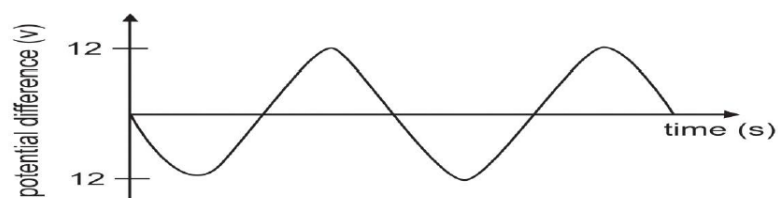


Which ONE of the following potential difference versus time graphs represents the output of this generator?

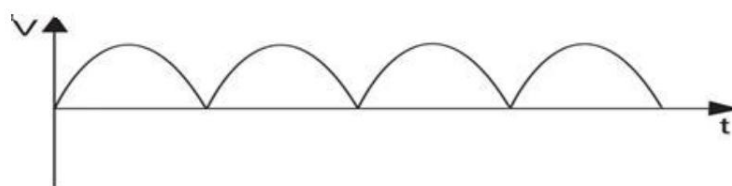
A



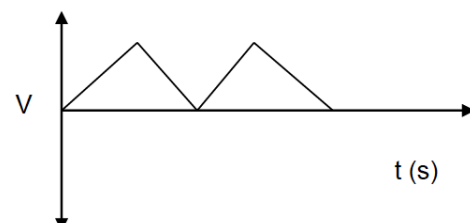
B



C



D



(2)

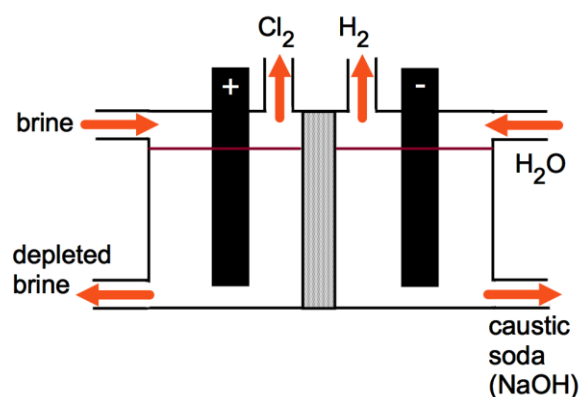
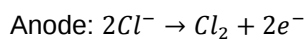
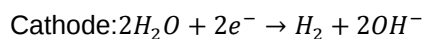
- 2.10 A 200 W UV light is shone on zinc metal and electrons are ejected from the metal. The 200 W UV light is replaced with a 40 W of the same UV light.

Which of the following correctly describes the electrons being ejected?

Number of photo-electrons ejected per second	Kinetic energy of photoelectrons
A Decreases	Decreases
B Increases	Increases
C Decreases	Stays the same
D Increases	Decreases

(2)

Electrolysis in a Membrane Cell



Terminology

Brine

Concentrated salt water.

Anode

Electrode where oxidation takes place.

Cathode

Electrode where reduction takes place.

Asbestos

Fibrous material used in the diaphragm cell – lung irritant.

Electrolysis

Process using electricity to create chemicals.

Demonstration

If you try to electrolyse a solution of table salt, no metal is made at the positive electrode.

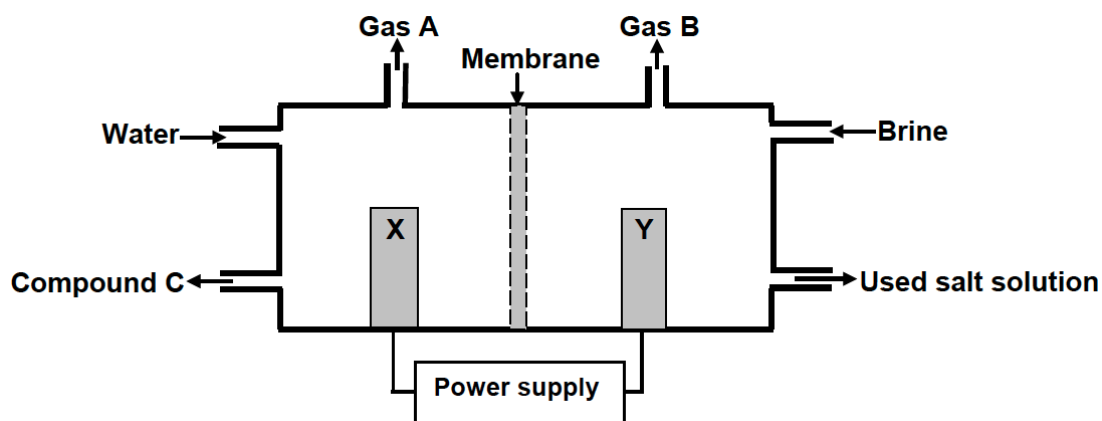
Carefully waft some of the bubble past your nose – do you smell anything familiar? The chlorine produced there smells like bleach because this is one of the ways in which bleach is produced!

Questions

Question 1

(Adapted from DOE Nov 2011, Paper 2, Question 10)

The simplified diagram of a membrane cell used in the chlor-alkali industry is shown below. Gas **A**, gas **B** and compound **C** are the three major products formed during this process. X and Y represent the two electrodes



- 1.1 Write down the function of the membrane in this cell. (1)
- 1.2 Which electrode, X or Y, is connected to the positive terminal of the power supply? Briefly explain how you arrived at the answer. (2)
- 1.3 Write down the NAME or FORMULA of:
 - 1.3.1 Gas A (1)
 - 1.3.2 Gas B (1)
 - 1.3.3 Compound C (1)
- 1.4 Write down the balanced net (overall) cell reaction taking place in this cell. (3)

Question 2

(Adapted from DOE, Nov 2009, Question 11)

- a.) Use the relative strengths of oxidising agents present in a brine solution to explain why sodium metal is NOT one of the products in this process. (2)
- b.) Chlorine is used in many useful products such as plastics, drugs and disinfectants. Environmentalists are protesting against the large-scale production of chlorine. They base their argument on the negative impact of chlorine on humans.
- Name ONE negative impact of chlorine on humans. (1)

Links

- <http://www.mindset.co.za/learn/xtra>
- <http://www.education.gov.za/Examinations/PastExamPapers/tabid/351/Default.aspx>
- http://www.ecexams.co.za/2013_September_Trial_Exams.htm