

Thermionic emission: Previous year questions 2000-17

2017

1. State two characteristics of a good thermionic emitter [2 marks]
2. State two factors upon which the rate of emission of thermions depends [2 marks]
3. Answer the following questions based on a hot cathode ray tube
 - a. Name the charged particles
 - b. State the approximate voltage used to heat the filament
 - c. What will happen to the beam when it passes through the electric field [3 marks]
4. State three factors on which the rate of emission of electrons from a metal surface depends [3 marks]
5. (i) What are free electrons
(ii) Why do they not leave the metal surface on their own?
(iii) How can they be made to leave the metal surface? (State any two ways) [4 marks]

2016

1. (i) In a cathode ray tube what is the function of anode
(ii) State the energy conversion taking place in a cathode ray tube
(iii) Write one use of cathode ray tube [3 marks]
2. State the characteristics required of a good thermionic emitter [2 marks]

2015

1. (i) What is thermionic emission?
(ii) Name the unit in which the work function of metal is expressed [2 marks]
2. Why is a cathode ray tube evacuated to a low pressure [2 marks]
3. What happens if the negative potential is changed on a grid [2 marks]

2014

1. An electron emitter must havework function andmelting point [2 marks]
2. In cathode ray tube, state
 - a. The purpose of covering cathode by thorium and carbon
 - b. The purpose of the fluorescent screen
 - c. How is it possible to increase the rate of emission of electrons [3 marks]

2013

1. Name the three main parts of a cathode ray tube [3 marks]

2012

1. Name the material which exhibits fluorescence when cathode rays fall on it [1 mark]
2. (i) Draw a simplified labelled diagram of a hot cathode ray tube
(ii) Name a common device, where a hot cathode ray tube is used [3 marks]

2011

1. State two properties which a substance should possess when used as a thermionic emitter [2 marks]

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2010

1. (i) Name a metal that is used as an electron emitter
(ii) Give one reason for using this metal [2 marks]

2009

1. (i) what is meant by free electrons
(ii) Why are they generally not able to leave the metallic surface?
(iii) Suggest one way by which these electrons could be made to leave the metal surface [3 marks]
2. In a cathode ray tube why is the
 - a. Filament made of tungsten
 - b. Cathode plate coated with oxide of barium or strontium
 - c. Thick glass screen coated with barium patinocyanide [3 marks]

2008

1. What is meant by work function of a metal? [2 marks]

2007

1. State two properties which a substance should possess when used as a thermionic emitter [2 marks]
2. Name the three main parts of a hot cathode ray tube. Mention one important function of each of the three main parts [3 marks]

2006

1. (i) Define thermionic emission
(ii) One use of thermionic emission
(iii) Name a substance which is a good thermionic emitter [3 marks]
2. State three properties that are common to and shown by both beta rays and cathode rays [3 marks]

2005

1. Why are materials of low work function preferred as thermionic cathode materials [1 mark]
2. (i) Draw a simplified labelled diagram of a hot cathode ray tube
(ii) Name a common device, where a hot cathode ray tube is used [3 marks]

2004

1. What is meant by work function of a metal? [2 marks]

2003

2. State two factor on which the rate of emission of thermions depends [2 marks]

2002

1. State briefly two uses of a cathode ray tube [2 marks]
2. (i) Draw a simplified labelled diagram of a hot cathode ray tube
(ii) Name a common device, where a hot cathode ray tube is used [3 marks]

2001

1. The following diagram is of the simplified version of an electron gun, which is an integral part of cathode ray tube. 'A' is a filament and 'B' is a metal cylinder.
 - a. Copy the diagram in your answer book. Draw a pair of plates P1 and P2 apply to electric field, a screen 'S' and an enclosure
 - b. What are the functions of A, B, P1 and P2 [5 marks]

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