

Engineering Questions by Topic

Ordinary Level

Question 2

45 Marks



1996 Question 2

- (a) Name the processes used to produce each of the following materials:
(i) Copper (ii) Wrought Iron (iii) Aluminium (iv) Steel.
- (b) With the aid of a line diagram, explain one of the processes in (a).
- (c) What is an alloy?
- (d) Give two practical applications for the use of silver steel.

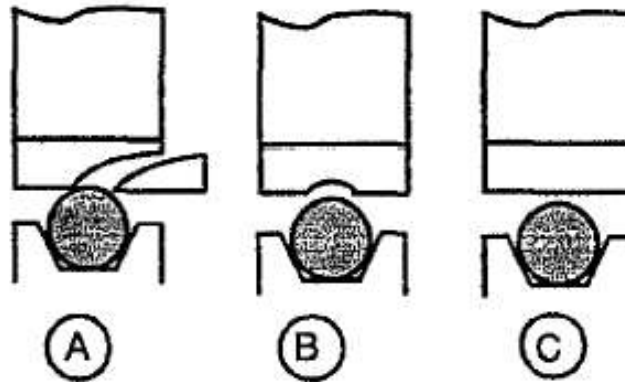


1997 Question 2

- (a) Using a **simple line drawing** describe the mass production of mild steel. Label the following on your drawing:
- (i) Ore used;
 - (ii) Furnace used in smelting;
 - (iii) Furnace used in the production of steel;
 - (iv) The percentage of carbon in mild steel.
- (b) What is the essential difference between bright and black mild steel?
- (c) List **two** properties of cast iron.
- (d) Explain the terms; *Ductility* and *Malleability*.

1998 Question 2

- (a) Describe in detail, naming the processes, the procedure for hardening and tempering a cold chisel.
- (b) On testing a number of chisels the results below were experienced.
Explain A, B and C.



- (c) Describe the essential difference between cold rolling and hot rolling of mild steel.
- (d) Explain why low carbon steels are case-hardened rather than hardened and tempered.



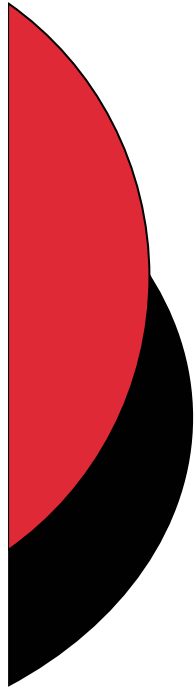
1999 Question 2

- (a) Explain the essential difference between *elasticity* and *ductility*.
- (b) Describe the heat treatment necessary to produce a hard surface on a screwdriver blade, made from mild steel.
- (c) Suggest suitable heat treatments for the following:
 - (i) A copper dish which is to be hollowed;
 - (ii) A lathe bed which needs to withstand wear;
 - (iii) A cold chisel for the workshop.



2000 Question 2

- (a) Explain the following heat treatments and give an example of the circumstances in which each is used:
- (i) Annealing; (ii) Normalising; (iii) Hardening; (iv) Tempering.
- (b) The jaws of a mild steel spanner must be prevented from wearing in use. Describe the heat treatment used to do this.
- (c) Explain the term *flame hardening* and give an application for its use.



2001 Question 2

- (a) Explain what is meant by the term 'work hardening'. How can the condition be treated.
- (b) Explain why low carbon steel may be case hardened, rather than hardened.
- (c) What does normalising mean?
- (d) Compare the process of hot rolling and cold rolling of metals, listing the advantages and disadvantages of each.



2002 Question 2

- (a) Distinguish between hardening and annealing of metals.
- (b)
 - (i) Explain how a centre punch made from high carbon steel is tempered after hardening;
 - (ii) Why is this process necessary?
- (c) State the type of heat treatment used in each of the following cases:
 - (i) A screwdriver point made from mild steel;
 - (ii) A copper candle holder which is hammered to shape.
- (d) Explain the following terms in relation to the properties of metals:
 - (i) Conductivity;
 - (ii) Elasticity.



2003 Question 2

- (a) Name the metals produced in the following furnaces:
- (i) Cupola;
 - (ii) Blast Furnace;
 - (iii) Electric Arc Furnace;
 - (iv) Basic Oxygen Furnace.
- (b) What is the essential difference between ferrous and non-ferrous metals and give one example of each?
- (c) Name the materials used to manufacture:
- (i) Bit of a soldering iron;
 - (ii) TV aerial;
 - (iii) Scriber.
- (d) State one industrial application for lead.

2004 Question 2

(a) Name the furnaces shown.

(i)



(ii)



(iii)



(b) For one of the furnaces above:

(i) Produce a simple line drawing and identify its parts;

(ii) Describe how heat is produced;

(iii) Name the metal produced.

(c) Give a suitable application for any two of the following:

(i) Aluminum; (ii) Mild Steel; (iii) Copper.

(d) Explain the term *Alloy*.



2005 Question 2

- (a) Name the furnaces used to produce any three of the following metals:
- (i) Mild Steel;
 - (ii) High Carbon Steel;
 - (iii) Pig Iron;
 - (iv) Cast Iron.
- (b) With the aid of a simple diagram, describe one of the furnaces in (a).
- (c) Give a suitable application for any two of the following metals:
- (i) Brass;
 - (ii) Lead;
 - (iii) Bronze.
- (d) Identify two methods for protecting steel from corrosion.



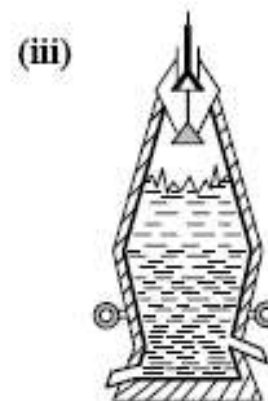
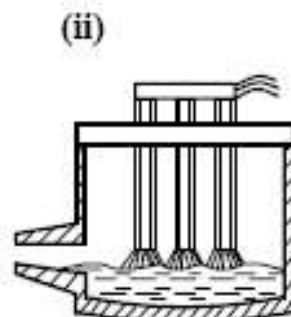
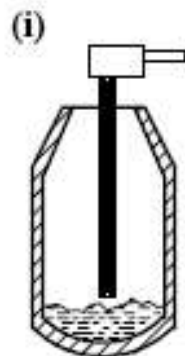
2006 Question 2

- (a) (i) Name a furnace used in the production of steel.
(ii) Make a sketch of this furnace and explain its operation.
- (b) State a suitable application for **any three** of the following metals:
(i) Stainless steel, (ii) Copper, (iii) Cast iron, (iv) Brass.
- (c) Describe **any two** of the following terms:
(i) Galvanised steel, (ii) Bright mild steel, (iii) Tinplate.
- (d) Name the ore from which **one** of the following is produced:
(i) Aluminium, (ii) Lead, (iii) Iron.



2007 Question 2

(a) Name **any two** of the furnaces shown and identify the metal produced in each:



(b) Identify the materials used to manufacture **any three** of the following:

(i) Soft drink cans, (ii) Hand files, (iii) Electrical wire, (iv) Roof flashings.

(c) Name the metals used to produce **any two** of the following alloys:

(i) Brass, (ii) Soft solder, (iii) Bronze.

2008 Question 2

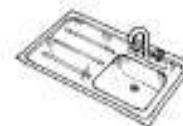
- (a) (i) Name **two** modern furnaces used for the production of steel.
(ii) Make a sketch of **any one** of the furnaces identified at 2(a)(i) and explain its operation.
- (b) Name suitable materials used to manufacture **any three** of the following:

(i) Door bolt,

(ii) Machine vice,

(iii) Kitchen sink,

(iv) Tap.



- (c) Identify **any three** of the following metals as ferrous or non-ferrous:

(i) Steel,

(ii) Aluminium,

(iii) Cast Iron,

(iv) Copper.

- (d) State **one** type of metal used as a protective coating on steel.




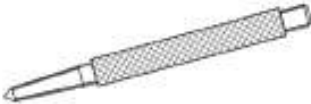


2009 Question 2

- (a) (i) Name the furnaces used to produce **any two** of the following materials:
Pig iron, High carbon steel, Cast iron.
- (ii) With the aid of a suitable diagram describe **one** of the furnaces identified at 2(a)(i) above.
- (b) (i) Explain the term *alloy*.
- (ii) Identify **two** alloys from the following list:
Solder, Copper, Brass, Zinc.
- (c) Select **any three** metals from the list below and state **one** suitable application for **each**:
Tungsten, Aluminium, Lead, Stainless steel.
- (d) What is the difference between a *ferrous metal* and a *non-ferrous metal*?



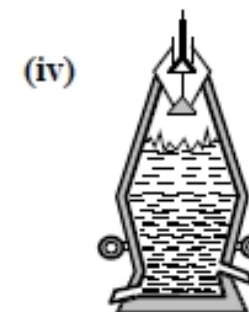
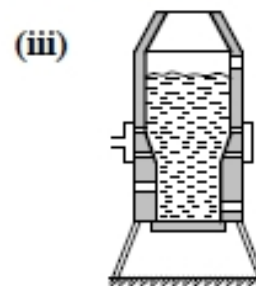
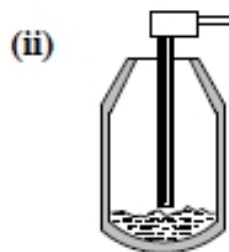
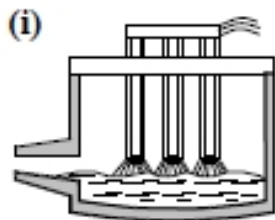
2010 Question 2

- (a) (i) With the aid of a suitable diagram, describe the operation of **any one** of the following furnaces:
Cupola furnace, Electric arc furnace, Blast furnace.
- (ii) For the furnace selected at 2(a)(i), name the material produced and suggest **one** suitable application for this material.
- (b) Select **any three** from the alloys listed below and state the metals used to produce **each**:
(i) Soft solder, (ii) Stainless steel, (iii) Brass, (iv) Bronze.
- (c) Name suitable materials used to manufacture **any three** of the following:
- (i) Centre punch, (ii) Satellite dish, (iii) Cutlery, (iv) Bench vice.
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- (d) Name **any two** non-ferrous metals.



2011 Question 2

(a) Name and state the functions of **any three** of the following furnaces.



(b) Describe **any three** of the following:

(i) High carbon steel,

(ii) Metal ore,

(iii) Tinplate,

(iv) Tuyere.

(c) Name suitable components manufactured from **any three** of the following metals:

(i) Aluminium,

(ii) Cast iron,

(iii) Lead,

(iv) High-speed steel.

(d) State **two** advantages of using metal alloys.

2012 Question 2

(a) Name a suitable material that could be used to manufacture **each** of the following:

(i) Scriber,



(ii) Radiator,



(iii) Step ladder.



(b) (i) Name a suitable furnace that could be used to produce **each** of the following metals:

Pig iron,

Cast iron,

High carbon steel.

(ii) With the aid of a suitable diagram, describe **one** of the furnaces identified at 2(b)(i) above.

(c) Select **any three** of the metals below and state if they are ferrous or non-ferrous:

(i) Stainless steel,

(ii) Zinc,

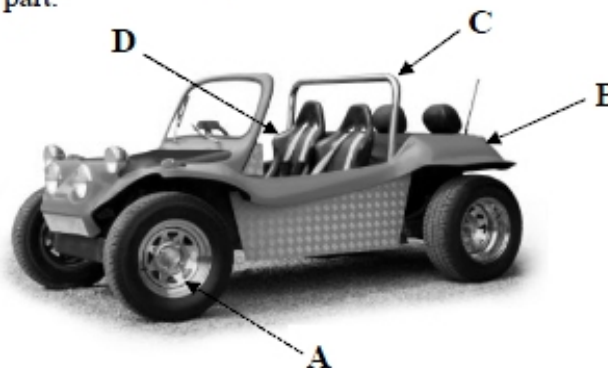
(iii) Tungsten,

(iv) Lead.

(d) Identify **any two** copper alloys.

2013 Question 2

- (a) Select **any three** of the metal alloys listed below and identify a suitable component manufactured from **each** alloy selected:
- (i) Stainless steel, (ii) Brass, (iii) High speed steel, (iv) Bronze.
- (b) (i) Name the metals produced from **any two** of the furnaces below:
Blast furnace, Cupola furnace, Electric arc furnace.
- (ii) With the aid of a suitable diagram, describe **one** of the furnaces identified at 2(b)(i) above.
- (c) Select **any three** of the parts labelled A, B, C and D and name a suitable material for the manufacture of **each** part.



- (d) Identify **two** methods used to protect ferrous metals against corrosion.