Engineering Questions by Topic

Ordinary Level

Question 4

45 Marks

1996 Question 4

(a) Explain the difference between soldering, brazing and welding in terms of:

(i) temperatures required;
(ii) strength of joint;
(iii) form of final joint;
(iv) types of flux.

(b) Explain, with the aid of a diagram, the operation of the electric arc process.

(c) Name **two** safety precautions to be observed when operating the electric arc process.

(d) What is the essential difference between the direct current supply and alternating current supply in the electric arc process?

1997 Question 4

(a) Explain the principal difference between hard soldering and soft soldering.

(b) Describe the process of brazing and refer especially to the following:

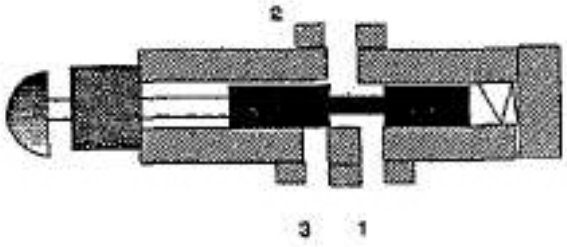
- **(i)** Composition of filler rod;
- **(ii)** Fusion temperature;
- **(iii)** Type of Flux;
- **(iv)** Source of heat.

(c) Name **two** safety precautions to be observed during the process of brazing.

(d) Name an electric arc welding process where an uncoated electrode is used.

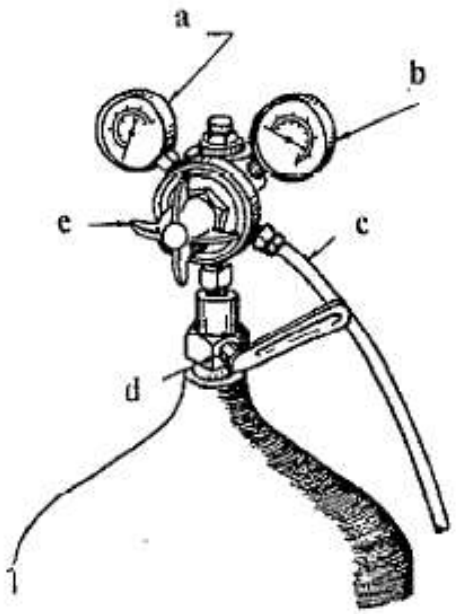
OR

(d) Name the component below and explain the function of 1, 2, and 3.



1998 Question 4

(a) Identify the components marked a,b,c,d,e on the gas cylinder shown.



(b) Name the type of flame shown in each diagram:

(i)  **(ii)**  **(iii)** 

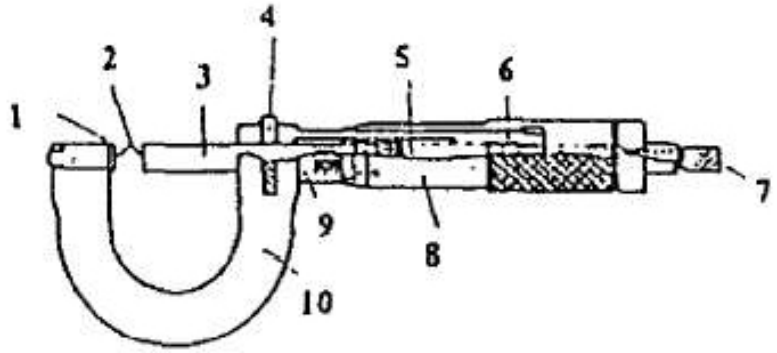
1998 Question 4 cont.

(c) Name **three** safety precautions to be observed when using the Oxy/Acetylene welding process.

(d) Name **two** other welding processes and give a simple description.

OR

(d) Name the main parts of the micrometer screw gauge shown.



1999 Question 4

(a) Explain the basic difference between fusion welding and bronze welding.

(b) State **two** safety precautions to be observed when using electric arc welding equipment.

(c) What is the function of flux coating on an electrode for electric arc welding?

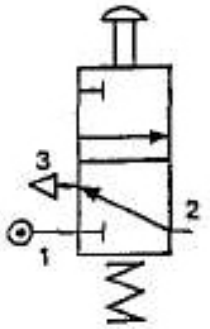
(d) Name the process for making a permanent joint in each of the following:

(i) Tinplate; **(ii)** Mild steel plate;

(iii) Light gauge aluminium; **(iv)** Perspex.

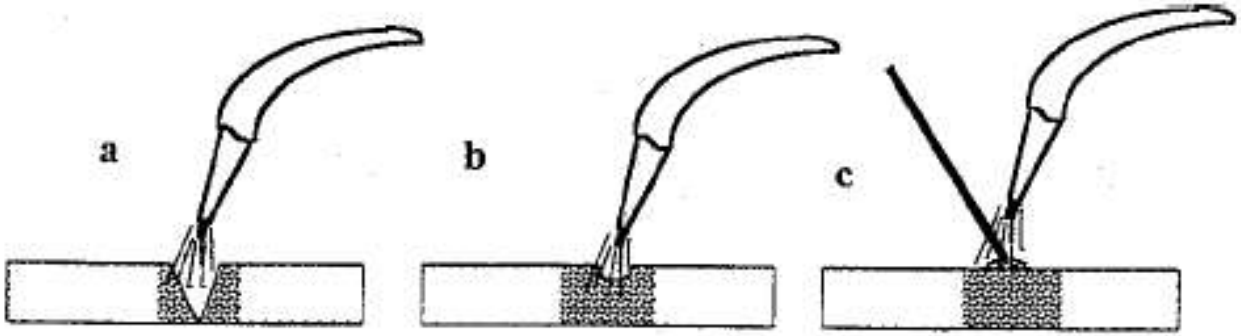
OR

(d) Name the pneumatic component shown and name parts 1, 2 and 3.



2000 Question 4

(a) Describe the welding stages in a, b and c.



(b) Name the welding process taking place.

(c) Name **two** other welding processes and describe **one** with the aid of a line diagram.

(d) Why is a resin flux used in the soldering of electrical connections?

2001 Question 4

(a) What two gases are most commonly mixed to give a flame hot enough for welding?

(b) Explain the differences between a passive and an active flux in the soldering process.

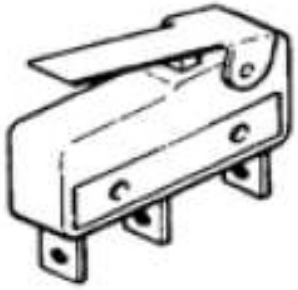
(c) Explain the basic differences between gas welding and manual arc welding.

(d) Explain the function of fluxed electrodes in manual arc welding.

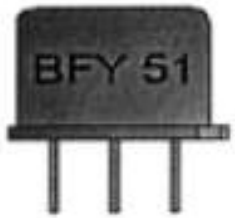
OR

(d) Name the two electrical components shown.

(i)



(ii)



2002 Question 4

(a) Answer the following briefly with regard to the soldering of components on a circuit board:

(i) What is the heat source used;

(ii) Why is the selection of flux important?

(iii) How is the flux applied?

(iv) What is the melting point of solder?

(b) Explain the differences between the following in relation to oxy-acetylene welding:

(i) Neutral flame; **(ii)** Oxidising flame; **(iii)** Carburising flame.

(c) Name **three** safety precautions to be observed when using electric arc welding equipment.

2003 Question 4

(a) Identify the three types of oxyacetylene flame below:

(i)

(ii)

(iii)

(b) How is protection from oxides achieved during electric arc welding?

2003 Question 4 cont.

(c) Name the process used for making a permanent joint in each of the following materials:

(i) Light gauge aluminium;

(ii) Tinplate;

(iii) Mild steel plate.

(d) Name **two** safety precautions to be taken when operating electric arc welding equipment.

OR

(d) Sketch the symbols for the following components in an electrical circuit:

(i) Buzzer;

(ii) LED;

(iii) Motor.

2004 Question 4

(a) Identify the **three** types of flame used in oxygen and acetylene welding.

(b) **(i)** Explain the function of a flux when soldering.

(ii) Describe the terms **(a)** Passive flux and **(b)** Active flux.

(c) Identify the welding processes shown and describe the basic differences between them.

(i) **(ii)**

(d) Name **two** safety precautions to be observed when brazing.

2005 Question 4

(a) Name the type of flame produced with **each** of the following gas settings:

(i) Equal balance between oxygen and acetylene;

(ii) Excess acetylene;

(iii) Excess oxygen.

(b) State the purpose of **any three** of the following welding terms:

(i) Flux, **(ii)** Filler rod, **(iii)** Pressure gauge, **(iv)** Generator.

(c) Describe **three** steps necessary to ensure a successful soft soldered joint.

(d) A face shield must be worn when arc welding. Explain **two** reasons for this.

2006 Question 4

(a) Identify the **three** types of oxy-acetylene flame shown:

(i) **(ii)** **(iii)**

(b) **(i)** Describe the basic **differences** between soft soldering and manual metal arc welding.

(ii) Suggest **one** suitable application for each process.

(c) **(i)** State the purpose of a flux when soldering.

(ii) When soldering electrical circuits, which of the fluxes, *active* or *passive*, is used?

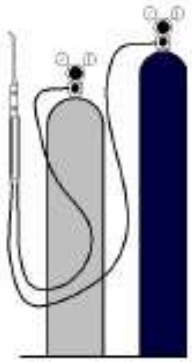
(iii) Give a reason for your answer in **(ii)**.

(d) State **two** health hazards associated with welding procedures.

2007 Question 4

(a) **(i)** Name the **two** gases most commonly used when gas welding.

(ii) Describe, with the aid of a suitable diagram, **any one** of the flames produced when gas welding.



(b) Explain **any three** of the following in relation to welding:

(i) Oxides, **(ii)** Flashback arrestor, **(iii)** Pressure gauge, **(iv)** Welding torch.

(c) Identify a suitable method used to make a permanent joint in **each** of the following materials:

(i) Heavy gauge mild steel plate;

(ii) Acrylic sheet;

(iii) Light gauge copper sheet.

(d) List **two** safety precautions to be observed when soldering electrical components.

2008 Question 4

(a) **(i)** Describe the differences between **any two** of the following joining processes:

Gas welding, Adhesive bonding, Arc welding.

(ii) Suggest **one** suitable application for **each** process selected at **4(a)(i)**.

(b) Explain, with the aid of suitable diagrams, how the following oxy-acetylene flames are produced:

(i) Neutral flame, **(ii)** Carburising flame, **(iii)** Oxidising flame.

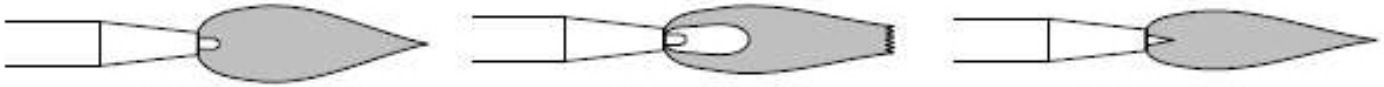
(c) Explain **any three** of the following in relation to soldering:

(i) Tinning, **(ii)** Flux, **(iii)** Capillary action, **(iv)** Oxides.

(d) Why is it essential to wear protective equipment when welding?

2009 Question 4

(a) Name the **three** types of oxyacetylene flame shown:



(i) (ii) (iii)

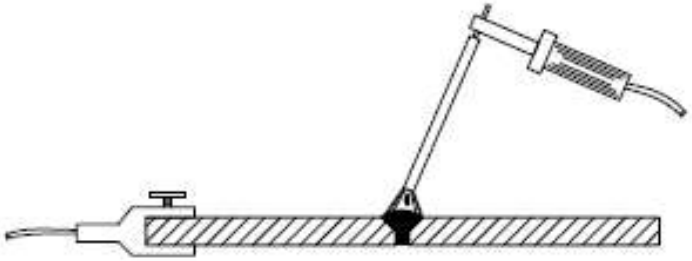
(b) Answer **any three** of the following in relation to **manual metal arc welding**:

(i) How is the heat produced for welding?

(ii) Why is a flux required at the joint?

(iii) What is the function for the earth clamp?

(iv) State **one** suitable safety precaution to be observed.



(c) Select **any three** from the following materials and identify the process used for making a permanent joint in **each** case.

(i) Tinplate, **(ii)** Mild steel plate, **(iii)** Acrylic, **(iv)** Light gauge aluminium.

(d) Give **two** reasons why goggles must be worn when gas welding.

2010 Question 4

(a) **(i)** Describe the basic differences between manual metal arc welding and adhesive bonding.

(ii) Suggest a suitable application for **each** of the joining processes in **4(a)(i)** above.

(b) Answer **any three** of the following in relation to **gas welding**:

(i) Name **any one** of the two gases most commonly used when gas welding;

(ii) What is the function of the flashback arrestor?

(iii) Name the flame produced when equal amounts of each gas is used;

(iv) State **one** safety precaution to be oberved.

(c) List **three** steps to be observed to ensure a successful soft soldered joint.

(d) Explain why it is important to work in a well ventilated area when using adhesives.

2011 Question 4

(a) With reference to the oxy-acetylene flame:

(i) Name the **three** types of flame which can be produced.

(ii) State the proportions of oxygen and acetylene required for **each** flame.

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

(i) State **any two** advantages for using pop rivets when joining sheet metal.

(ii) Why is manual metal arc welding unsuitable for joining light-gauge sheet metal?

(iii) State **any two** safety precautions to be observed when using adhesives to bond acrylic.

(iv) Outline the differences between the two nuts **A** and **B** shown below.

A

B

(c) Describe **any three** of the following terms in relation to soft soldering:

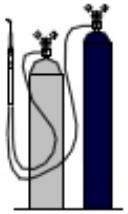
(i) Oxides, **(ii)** Passive flux, **(iii)** Tinning, **(iv)** Chemically clean.

(d) Dark goggles must be worn when brazing. Explain **two** reasons for this.

2012 Question 4

(a) Name and sketch the type of flame produced with **each** of the following oxyacetylene gas settings:

(i) Excess oxygen;
(ii) Excess acetylene;
(iii) Equal balance between oxygen and acetylene.



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

(i) State **any two** advantages for using spot welding.
(ii) Outline **two** requirements to ensure a good adhesive joint.
(iii) Suggest a suitable method for joining light gauge aluminium.
(iv) Explain the purpose for the nylon insert used in locknuts.

(c) **(i)** State **any two** functions of a flux in the soldering process.
(ii) Explain the difference between a *passive flux* and an *active flux*.

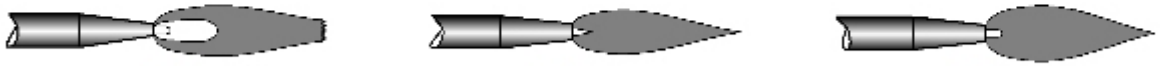
(d) State **two** safety precautions to be observed when working in a welding environment.

2013 Question 4

(a) **(i)** Describe the basic differences between manual metal arc welding and gas welding.

(ii) Suggest a suitable application for **each** of the welding processes in **4(a)(i)** above.

(b) Name and describe the **three** types of oxy-acetylene flame shown.



(i) **(ii)** **(iii)**

(c) Answer **any three** of the following:

(i) State **two** advantages of using adhesives when joining materials.
(ii) Name the special type of nut shown and state an advantage of using it.
(iii) Outline **two** requirements to ensure a good soldered joint.
(iv) Suggest a reason why pop riveting is suitable for joining sheet metal.

(d) State **two** safety precautions to be observed when using oxy-acetylene equipment for brazing.