Engineering Questions by Topic

Ordinary Level

Question 7

45 Marks

1996 Question 7

(a) Name **three** principal classes of fit and give an example of each one.

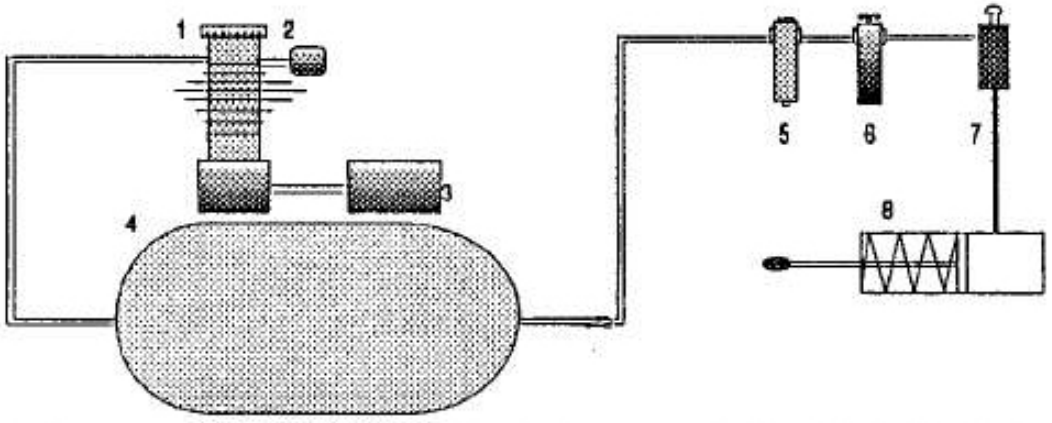
(b) Define the term tolerance as used in a system of limits and fits.

(c) Holes and shafts of 80 mm nominal diameter are machined so as to give a precision location fit when assembled. The following conditions are specified:

(i)	Minimum hole diameter	80.00 mm
(ii)	Minimum shaft diameter	79.971 mm
(iii)	Minimum clearance	0.010 mm
(iv)	Maximum clearance	0.059 mm

Determine the tolerance for the shaft and the hole

OR



The layout of a pneumatic system is shown. Identify the components labelled and state the function of any **five**.

1997 Question 7

(a) Name the alloy formed by:

(i) lead and tin;

(ii) copper and zinc.

(b) Name **two** precious metals.

(c) Describe how copper is annealed and give an example of its use.

(d) In the production of copper, name the **final product** after smelting the copper concentrates.

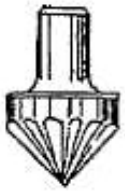
1998 Question 7

(a) What is meant by a transition it in the ISO system of limits and fits?

(b) A shaft is made to the dimensions 80 ± 0.05. State the following:

(i) Nominal dimension; (ii) Upper Limit; (iii) Lower Limit; (iv) Tolerance.

(c) Describe each of the cutting tools shown and give an example of their use:



(i)

(ii)

(iii)

OR

(c) Explain the following terms:

(i) Mottling; (ii) Enamelling; (iii) Etching.

1999 Question 7

(a) Define the term *interference fit* as used in a system of limits and fits.

(b) Explain the essential difference between a plug gauge and a gap gauge.

(c) Holes and shafts of 50mm nominal diameter are machined so as to give a precision location fit when assembled. The following conditions are specified:

(i)	Minimum hole diameter	50.00mm
(ii)	Minimum shaft diameter	49.971mm
(iii)	Minimum clearance	0.010mm
(iv)	Maximum clearance	0.059mm

Determine the tolerance for the shaft and the hole.

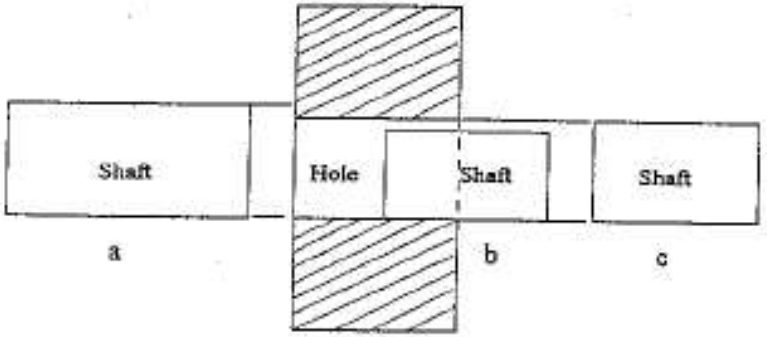
OR

(c) Describe the operation and function of **any one** of the following:

(i) Dial gauge; **(ii)** Double acting pneumatic cylinder; **(iii)** Solenoid.

2000 Question 7

(a) Name the type of fits used in the hole basis system for a, b and c.



(b) A shaft is to be made to the dimensions 50mm ± 0.06, state:
(i) The nominal dimension; **(ii)** The upper limit; **(iii)** The tolerance.

(c) Explain the terms: **(i)** bilateral and **(ii)** unilateral tolerance.

OR

(c) Explain any two of the following terms:
(i) Transistor; **(ii)** Gap Gauge; **(iii)** Work hardening.

2001 Question 7

(a) Explain (i) Interference fit; (ii) Clearance fit and (iii) Transition fit.

(b) A shaft is to be made 80 ± 0.05. Determine:

(i) The maximum diameter of the shaft;

(ii) The minimum diameter of the shaft;

(iii) The tolerance on the shaft.

(c) Explain, with the aid of sketches, the following thread terms: (i) Pitch; (ii) Crest; (iii) Root.

OR

Explain clearly the purpose of **any three** of the following:

(i) Diode; (ii) Solar cell; (iii) Reamer; (iv) Centre drill.

2002 Question 7

(a) In relation to limits and fits, explain the following:

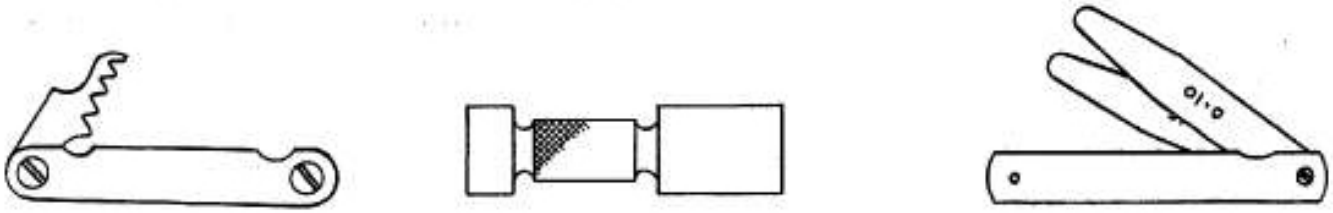
(i) Interference fit; **(ii)** Clearance fit.

(b) A shaft is to be manufactured to a diameter of 80 ± 0.05 mm. Determine:

(i) The maximum diameter of the shaft;
(ii) The minimum diameter of the shaft;
(iii) The tolerance on the shaft.

(c) Name the **three** gauges shown and give an application for **any one**.

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



OR

(c) Explain the operation of **any one** of the following:

(i) Single acting pneumatic cylinder;
(ii) Transistor.

2003 Question 7

(a) A shaft is made to the following dimensions 80mm ± 0.05.

State the

(i) Nominal Diameter;
(ii) Upper Limit;
(iii) Lower Limit;
(iv) Tolerance.

(b) Explain the following:

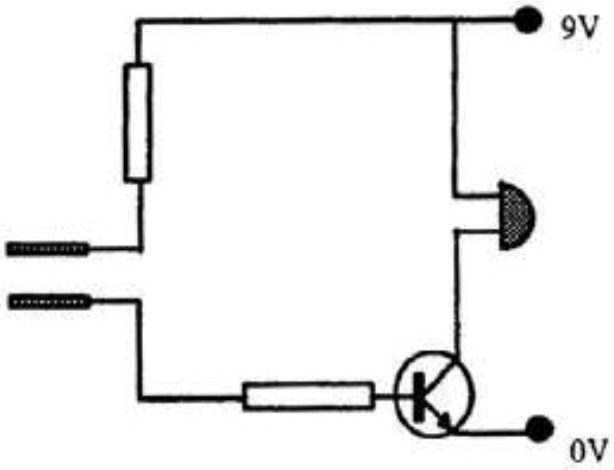
(i) Clearance fit;
(ii) Interference fit.

2003 Question 7 cont.

(c) Name the gauges shown and explain their function in relation to limits and fits.

OR

(c) Explain a function for the circuit shown and what purpose the transistor serves?



2004 Question 7

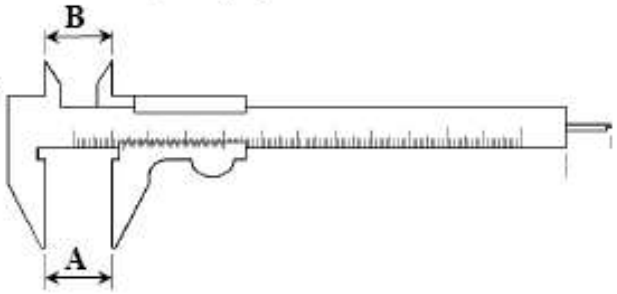
(a) Explain **any two** of the following:

(i) Interference fit; **(ii)** Clearance fit; **(iii)** Transition fit.

(b) A hole is manufactured to the following dimensions 50 mm ± 0.04. For this hole state:

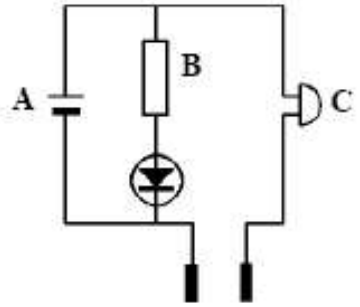
(i) Nominal diameter; **(ii)** Upper Limit; **(iii)** Lower Limit; **(iv)** Tolerance.

(c) Name the measuring instrument shown and identify the type of measurement taken at A and B.



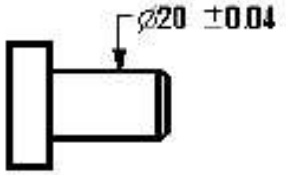
OR

(c) Explain a function for the circuit shown and name **any two** of the components A, B and C.



2005 Question 7

(a) A steel shaft is manufactured to the dimensions shown.



State the
- **(i)** Nominal diameter of the shaft;
- **(ii)** Maximum diameter of the shaft;
- **(iii)** Minimum diameter of the shaft;
- **(iv)** Tolerance on the shaft.

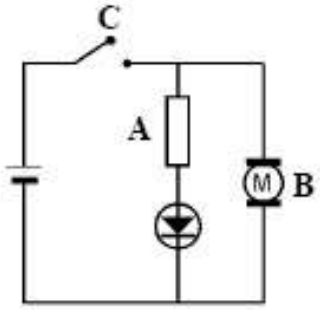
(b) Using sketches, explain the difference between an interference fit and clearance fit of a hole and shaft assembly.

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

(i) Plug gauge, **(ii)** Vernier height gauge, **(iii)** Gap gauge, **(iv)** Feeler gauge.

OR

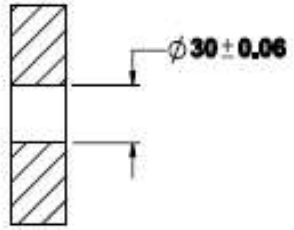
(c) Name the components **A** and **B** and explain the operation of the circuit when switch **C** is closed.



2006 Question 7

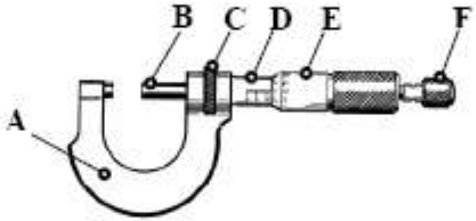
(a) Name **any two** types of fit in the assembly of a shaft and hole.

(b) A hole is produced in a steel plate to the dimensions shown.



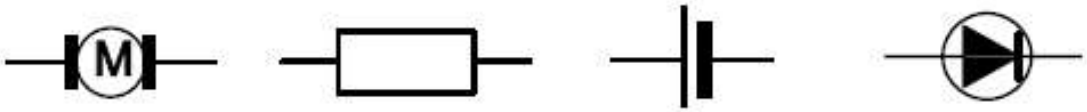
State the
- **(i)** Nominal diameter of the hole;
- **(ii)** Maximum diameter of the hole;
- **(iii)** Minimum diameter of the hole;
- **(iv)** Tolerance of the hole.

(c) Name the measuring instrument shown and identify **any two** of the parts indicated.



OR

(c) Identify **any three** of the electronic symbols shown:



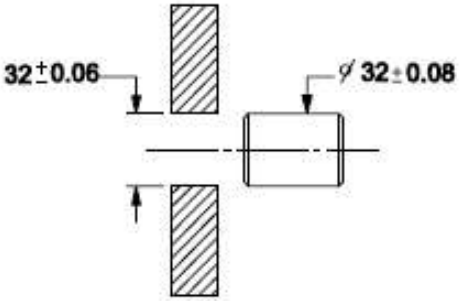
(i) **(ii)** **(iii)** **(iv)**

2007 Question 7

(a) In relation to limits and fits, explain **any two** of the following:

(i) Interference fit, **(ii)** Clearance fit, **(iii)** Tolerance.

(b) A hole and shaft are produced to the dimensions shown.



State the:

(i) nominal diameter of the hole;

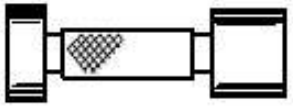
(ii) nominal diameter of the shaft;

(iii) lower limit of the hole;

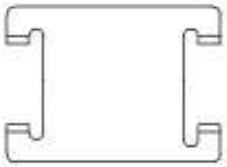
(iv) higher limit of the shaft.

(c) Name and give an application for **any two** of the gauges shown below:

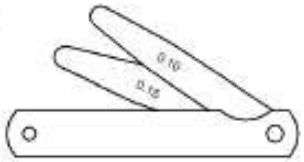
(i)



(ii)



(iii)



OR

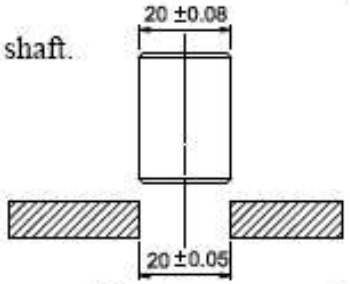
(c) Name **any three** of the electrical symbols shown:

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

2008 Question 7

(a) State **any two** ways of *accurately* measuring the diameter of a shaft.

(b) A hole and shaft are produced to the dimensions shown.

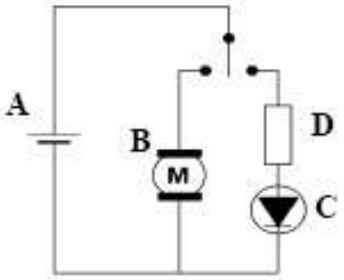


State the:
- **(i)** Nominal diameter of the hole;
- **(ii)** Largest diameter of the shaft;
- **(iii)** Smallest diameter of the hole;
- **(iv)** The type of fit which will result from the assembly of the largest shaft and smallest hole.

(c) Name and give **one** application for **any three** of the instruments shown.

OR

(c) Name **any three** of the electronic symbols labelled A, B, C and D in the circuit diagram.

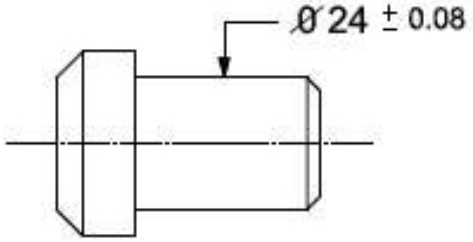


2009 Question 7

(a) Describe, using sketches, **any two** of the following types of fit for a shaft and hole assembly:

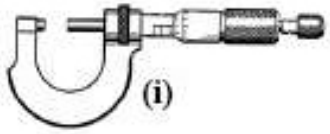
(i) Clearance fit, **(ii)** Transition fit, **(iii)** Interference fit.

(b) A brass shaft is machined to the dimensions shown.

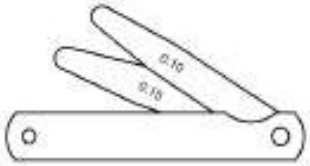


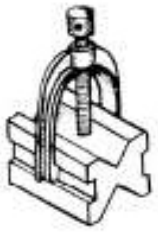
State the:
- **(i)** nominal diameter of the shaft;
- **(ii)** maximum diameter of the shaft;
- **(iii)** minimum diameter of the shaft;
- **(iv)** tolerance on the shaft.

(c) Name and give **one** application for **any three** of the instruments shown:


(i)

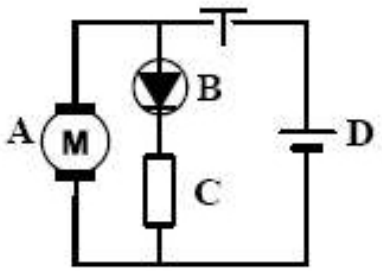

(ii)


(iii)


(iv)

OR

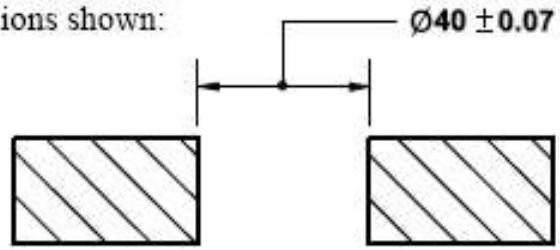
(c) Identify **any three** of the electronic symbols shown in the circuit diagram.



2010 Question 7

(a) State **two** advantages of a digital readout on measuring instruments.

(b) A hole is produced in an aluminium plate to the dimensions shown:



State the:

(i) Nominal diameter of the hole;

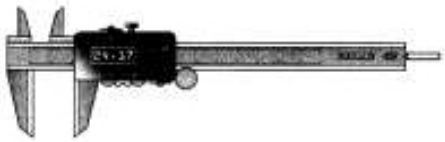
(ii) Maximum diameter of the hole;

(iii) Minimum diameter of the hole;

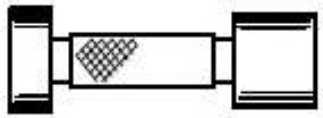
(iv) Tolerance of the hole.

2010 Question 7 cont.

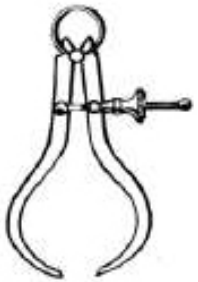
(c) Name and give **one** application for **any three** of the tools shown.



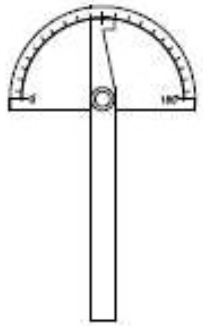
(i)



(ii)



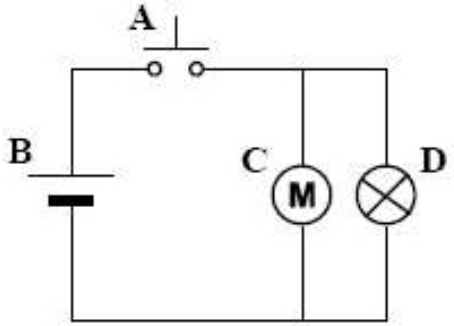
(iii)



(iv)

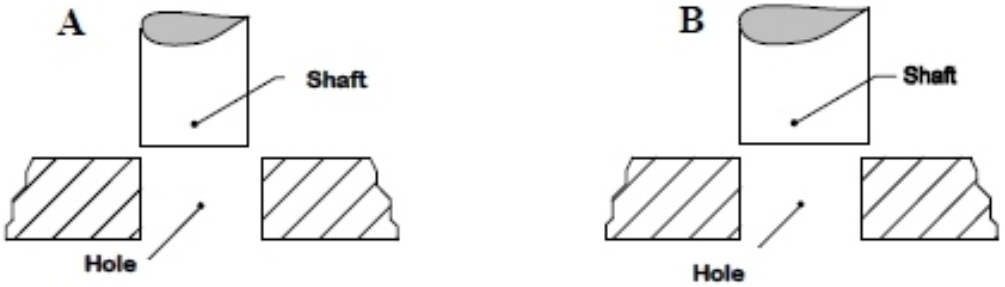
OR

(c) Identify **any three** of the electronic components **A**, **B**, **C** and **D** shown in the circuit.



2011 Question 7

(a) Name and describe the types of fit shown at **A** and **B**.



(b) With reference to **Figure 1** shown opposite, state the:

(i) Nominal diameter of the hole;

(ii) Smallest diameter of the hole;

(iii) Largest diameter of the shaft;

(iv) The type of fit which will result from the assembly of the smallest hole and the largest shaft.

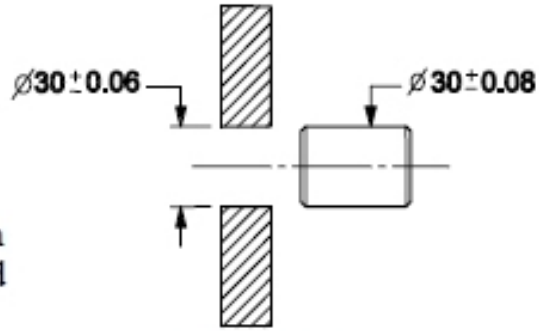
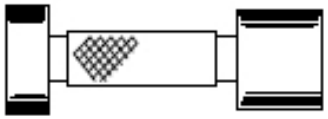


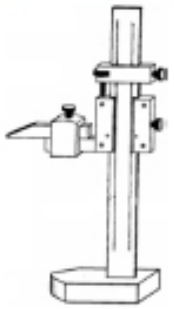
Figure 1

2011 Question 7 cont.

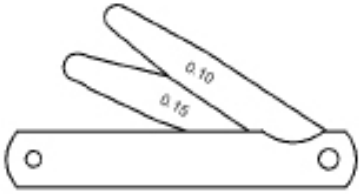
(c) Name and give **one** application for **any three** of the instruments shown below.



(i)



(ii)



(iii)

(iv)

OR

(c) Draw the circuit symbols for **any three** of the following electronic components:

(i) LED,

(ii) Fixed resistor,

(iii) Motor,

(iv) Transistor.

2012 Question 7

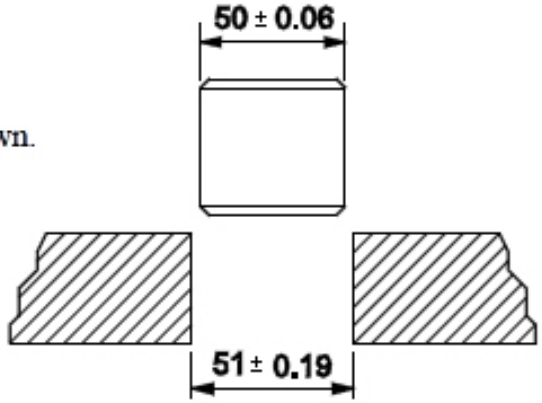
(a) Describe **any two** of the following terms in relation to limits and fits:

(i) Tolerance;

(ii) Interference fit;

(iii) Upper limit.

(b) A hole and shaft are manufactured to the dimensions shown.



State the:

(i) Nominal diameter of the hole;

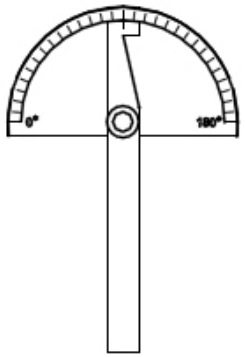
(ii) Smallest diameter of the hole;

(iii) Largest diameter of the shaft;

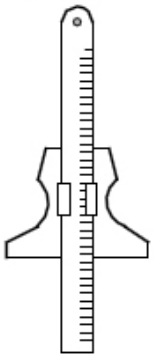
(iv) The type of fit which will result from the assembly of the smallest hole and the largest shaft.

2012 Question 7 cont.

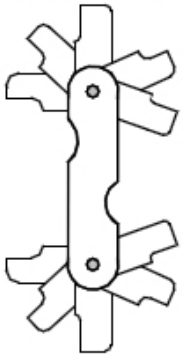
(c) Name and give **one** application for **any three** of the instruments shown.



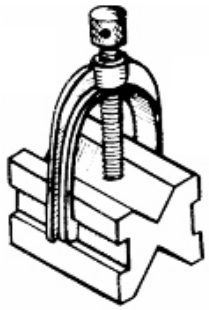
(i)



(ii)



(iii)



(iv)

OR

(c) Draw the circuit symbols for **any three** of the following electronic components:

(i) Bulb,

(ii) Battery,

(iii) Switch,

(iv) Variable resistor.

2013 Question 7

(a) Name and describe **any two** types of fit possible when assembling a shaft and hole.

(b) A shaft is manufactured from steel to the dimensions shown.

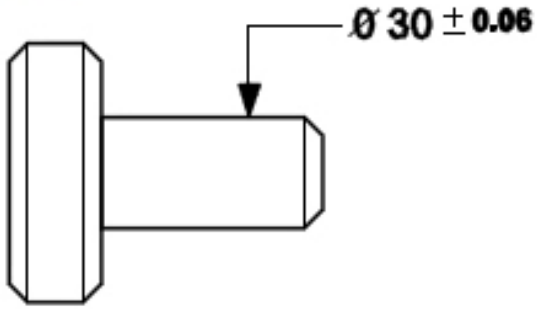
State the:

(i) Nominal diameter of the shaft;

(ii) Smallest diameter of the shaft;

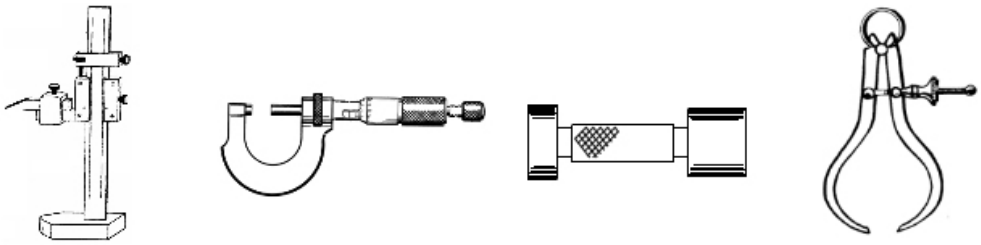
(iii) Largest diameter of the shaft;

(iv) Tolerance of the shaft.



2013 Question 7 cont.

(c) Name **any three** of the instruments shown and give **one** application for **each** instrument named.



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

OR

(c) Name **any three** of the components shown below and state a suitable use for **each** component named.

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