METALWORK

SCHEME OF EXAMINATION

There will be three papers, Papers 1, 2 and 3, all of which must be taken. Papers 1 and 2 will be a composite paper to be taken at one sitting.

PAPER 1: Will consist of forty multiple-choice objective questions all of which must be answered within 1 hour for 40 marks.

PAPER 2: Will consist of five essay-type questions. Candidates will be required to answer four questions within 1 hour 30 minutes for a total of 60 marks.

PAPER 3: Will consist of two practical works, one of which must be carried out by candidates within 3 hours for 100 marks. Candidates shall be allowed 10 minutes, prior to the commencement of the test to study the drawings. They will be required to make a test piece for which the appropriate drawings will be supplied.

Schools will be required to supply materials needed for the test of their candidates.

SAMPLE QUESTION

PAPER 1

[OBJECTIVES]

1. Which of the following should be worn when pouring molten metal?
   A. Shield
   B. Helmet
   C. Mask
   D. Goggles

2. Which of the following materials is suitable for forging?
   A. Cast iron
   B. Brass
   C. Mild Steel
   D. Bakelite
3. The type of joint illustrated above is a
   A. double strap butt.
   B. double riveted lap.
   C. single strap butt.
   D. single riveted lap.

Use the sketch below to answer Questions 4 and 5.

4. The tool labeled X is known as
   A. creasing iron.
   B. bick iron.
   C. funnel stake.
   D. hatchet stake.

5. The operation being carried out on workpiece Y is called
   A. raising.
   B. wiring.
   C. beading.
   D. bending.

6. The sand used for making moulds is
   A. dry sand.
   B. facing sand.
   C. green sand.
   D. parting sand.
7. The statement that defines the requirements of an artifact is referred to as
   A. brief.
   B. specification.
   C. analysis.
   D. situation.

8. The operation performed using the tailstock is
   A. drilling.
   B. turning.
   C. parting off.
   D. screw cutting.

9. The micrometer reading indicated in the figure is
   A. 10.02 mm.
   B. 10.15 mm.
   C. 10.20 mm.
   D. 10.67 mm.

10. Which of the following materials will require carburizing during heat treatment?
    A. High carbon steel
    B. High speed steel
    C. Mild steel
    D. Cast iron

PAPER 2
[ESSAY]

1. (a) Copy and complete the table below:

<table>
<thead>
<tr>
<th></th>
<th>Soft Soldering</th>
<th>Hard Soldering</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flux</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Source of heat</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thickness of parent metal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Filler Metal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>One safety precaution</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(b) (i) Sketch the hatchet soldering iron.
     (ii) Label two parts of the sketch in (i).

2. (a) State one use of the following parts of the centre lathe.
     (i) Tail stock
(ii) Tool post  
(iii) Carriage  
(iv) Head stock

(b) Sketch the parting off tool.

(c) State two safety precautions to be observed when operating the centre lathe.

PAPER 3  
[PRACTICAL]

1. The following materials are supplied:

(a) one flat mild steel plate, 97mm x 52mm x 3mm:
(b) one flat mild steel plate, 73mm x 34mm x 3mm:
(c) one cotton bag 120mm x 60mm to enclose the finished work.
(d) two tie-on labels.

The diagram below shows the assembly and detailed view of each part of a fitting exercise. Using the materials supplied, prepare the parts and assemble the pieces.
2. The following materials are supplied:

   (a) **one** piece of free cutting mild steel rod, Ø35mm x 90mm;
   (b) **one** cotton bag, 70mm x 10mm;
   (c) **two** tie-on labels.

The diagram below shows a detailed view of a machine part. Produce the part using the material which has been supplied.

![Diagram of machine part](image)

**NOTE**

1. Not drawn to scale
2. All dimensions in mm
3. Tolerance = ± 0.5