



**KIBABII UNIVERSITY**

**2020/2021 ACADEMIC YEAR**

**FIRST YEAR FIRST SEMESTER**

**Special/Supplementary EXAMINATIONS**

**FOR THE DEGREE OF BACHELOR OF SCIENCE IN RENEWABLE ENERGY AND  
BIOFUELS TECHNOLOGY**

COURSE CODE: REN113

COURSE TITLE: **Workshop Technology and Practice**

DATE: 29/09/2021

TIME: 8:00-10:00AM

**INSTRUCTIONS TO CANDIDATES**

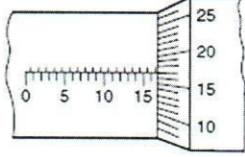
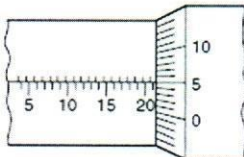
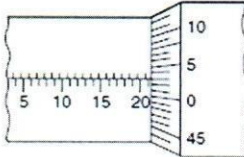
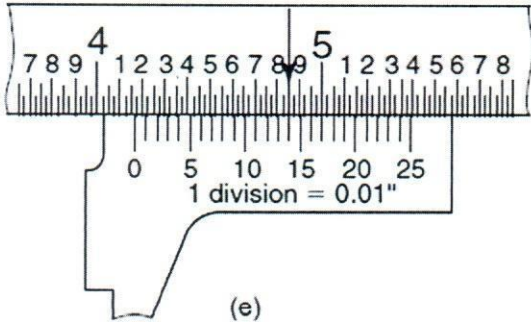
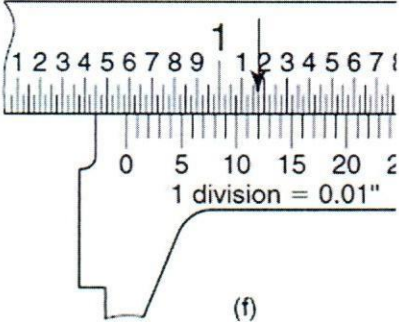
Answer question **ONE** and any other **two** questions

This paper consists of **5** printed pages. Please Turn over

### Question One

a)	In the event of a workmate receiving a severe electric shock that renders him/her unconscious, what emergency action should you take?	[5 Marks]																		
b)	With the aids of sketches describe the difference between straight-type and angle-type portable grinding machines and give examples where each type would be used	[5 Marks]																		
c)	Compare the relative advantages and limitations of a bench drilling machine, a pillar drilling machine and a radial arm drilling machine. Give examples where each type would be used.	[5 Marks]																		
d)	As an employee you have duties under the Health and Safety at Work Act. Copy out and complete Table Q1 by writing brief comments regarding your duties in the following circumstances. <i>Table Q1</i>	[5 Marks]																		
<table border="1"> <thead> <tr> <th>Circumstances</th> <th>Duties</th> </tr> </thead> <tbody> <tr> <td>You are uncertain how to operate a machine needed to complete your task</td> <td></td> </tr> <tr> <td>You need to carry some sheet metal with very sharp edges</td> <td></td> </tr> <tr> <td>You are working on site and you have mislaid your safety helmet</td> <td></td> </tr> <tr> <td>You find that the belt guard has been removed from a machine you have been told to use</td> <td></td> </tr> <tr> <td>You have spilt hydraulic oil on the floor whilst servicing a machine</td> <td></td> </tr> <tr> <td>The earth wire has come disconnected from a portable power tool you are using</td> <td></td> </tr> <tr> <td>Your supervisor has told you to clear up the rubbish left by another worker</td> <td></td> </tr> <tr> <td>You find someone smoking in a prohibited area</td> <td></td> </tr> </tbody> </table>			Circumstances	Duties	You are uncertain how to operate a machine needed to complete your task		You need to carry some sheet metal with very sharp edges		You are working on site and you have mislaid your safety helmet		You find that the belt guard has been removed from a machine you have been told to use		You have spilt hydraulic oil on the floor whilst servicing a machine		The earth wire has come disconnected from a portable power tool you are using		Your supervisor has told you to clear up the rubbish left by another worker		You find someone smoking in a prohibited area	
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e)	Explain what is meant by the term <i>parallax errors</i> when marking out using a steel rule. How can such errors be minimized?	[5 Marks]																		
f)	Explain why portable electrical equipment should be:																			
i)	Earthed unless it is 'double-insulated'.																			
ii)	Operated from a low-voltage supply.																			
iii)	Protected by an earth leakage isolator incorporating a residual current detector.	[5 Marks]																		

### Question Two

a)	Sketch a micrometer caliper	[5 Marks]
b)	<p>Write down the micrometer readings shown in Fig. Q2(a).</p> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;">  <p>(a) 0–25 mm micrometer</p> </div> <div style="text-align: center;">  <p>(b) 25–50 mm micrometer</p> </div> <div style="text-align: center;">  <p>(c) 75–100 mm micrometer</p> </div> </div> <p>Figure Q2(a)</p>	[5 Marks]
c)	Sketch a vernier caliper that can be used for internal and external measurements, and also depth measurements. Name its more important features.	[5 Marks]
d)	<p>Write down the vernier readings shown in Fig. Q2 (b).</p> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;">  <p>(e)</p> </div> <div style="text-align: center;">  <p>(f)</p> </div> </div> <p>Figure Fig. Q2 (b)</p>	[5 Marks]

### Question Three

Fig. Q3 shows some various types of fire extinguisher.		
i)	State the types of fire upon which each extinguisher should be used and any precautions that should be taken.	[15 Marks]
ii)	State the colour coding that identifies each type of fire extinguisher.	[5 Marks]

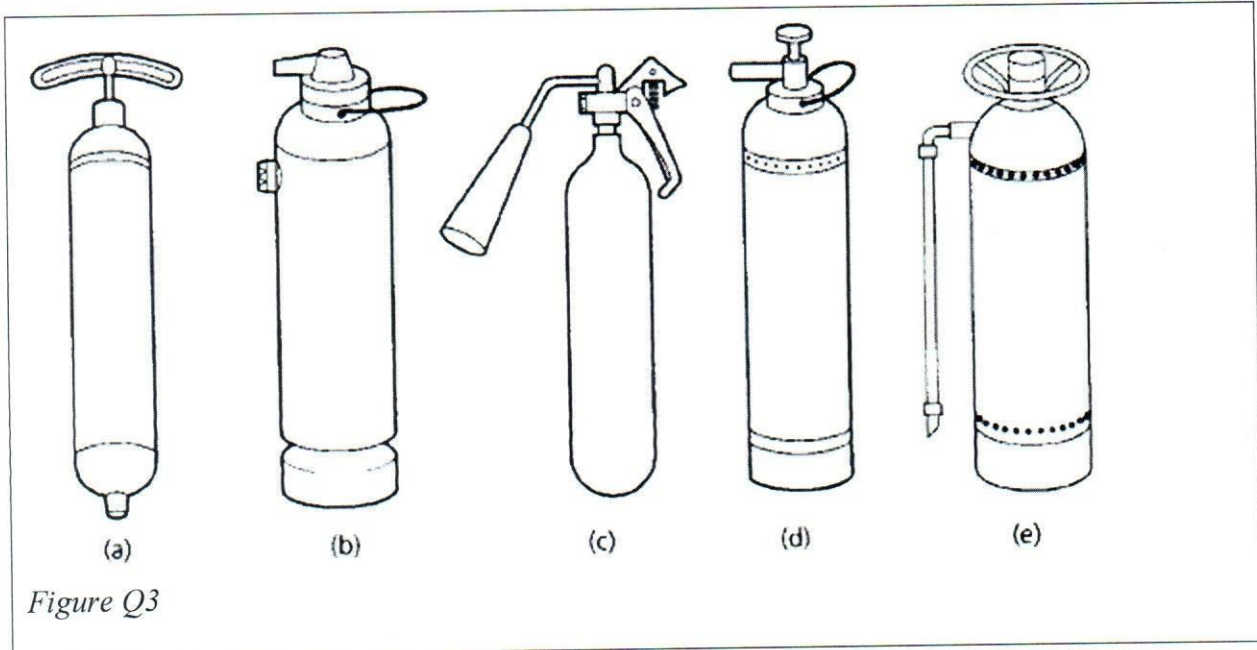


Figure Q3

**Question Four**

a)	List FIVE advantages for using templates in sheet metalwork.	[5 Marks]
b)	List the essential information that should appear on a template.	[5 Marks]
c)	With the aid of sketches briefly describe THREE different types of templates and show how they are used.	[3 Marks]
d)	Describe how the profile of the template can be transferred to workpiece material.	[2 Marks]
e)	Describe two ways in which a scribed line can be made to show up more clearly.	[2 Marks]
f)	With the aid of sketches describe how the scribing points of the following marking out tools should be sharpened:	
	i) Divider points	
	ii) Dot-punch point.	[3 Marks]

**Question Five**

a)	Explain how a file is specified and give typical applications of (i) a half-round file, (ii) a three-square file, (iii) a ward file, (iv) a round file and (v) a flat file.	[10 Marks]
b)	Name the faults you would look for before using the following items of equipment:	
	i) hammer	
	ii) chisel	
	iii) File	
	iv) Spanner	
	v) Screwdriver	[5 Marks]
c)	In the interests of safety what visual inspections of an item of portable	[2 Marks]

	equipment should be carried out before accepting it for use?	
d)	State how the hazard of electric shock can be minimized when using portable power tools.	<i>[3 Marks]</i>