



**UNIVERSITY OF SWAZILAND
FINAL EXAMINATION PAPER**

PROGRAMME: BSC AB E II

COURSE CODE: ABE 207

TITLE OF PAPER: WORKSHOP TECHNOLOGY

TIME ALLOWED: TWO (2) HOURS

SPECIAL MATERIAL REQUIRED: NONE

**INSTRUCTIONS: ANSWER QUESTION ONE AND ANY TWO
OTHER QUESTIONS.**

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GRANTED BY THE CHIEF INVIGILATOR**

SECTION I COMPULSORY

QUESTION 1

a) TYPES OF MATERIALS

[15 marks]

Identify the materials in the first column of Table 1 by the classes in the subsequent columns. Mark your answer by a "X".

Table 1. Classifications of engineering materials

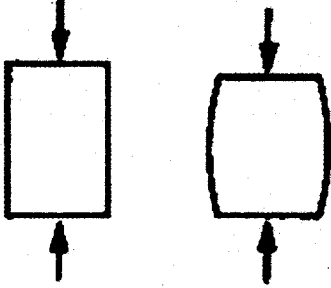

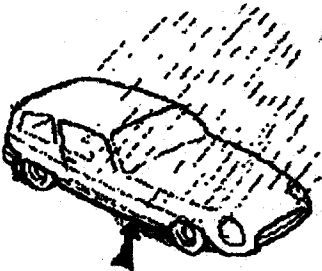
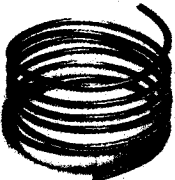
	Metals		Non-Metals	
	Ferrous Metal	Nonferrous Metal	Natural Material	Artificial Material
Wood				
Copper				
Leather				
Glass				
Ceramics				
Mild Steel				
Cast Iron				
Rubber				
Platic cup				
Stainless steel				
Iron ore				
Tin				
Cotton				
Aluminium				
PVC				

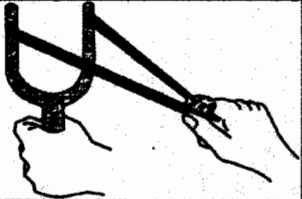
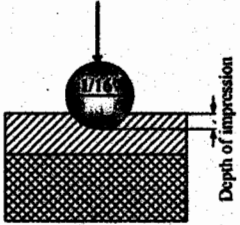

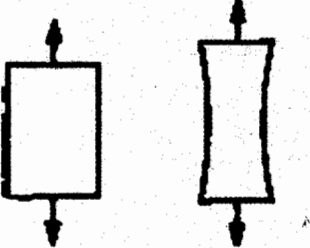
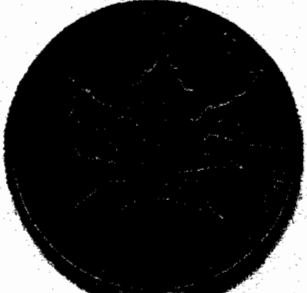
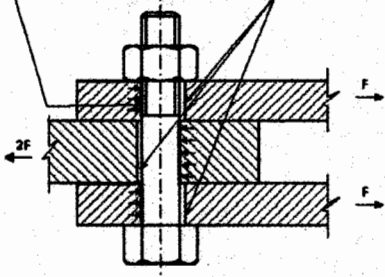
b) PROPERTIES OF MATERIALS
marks]

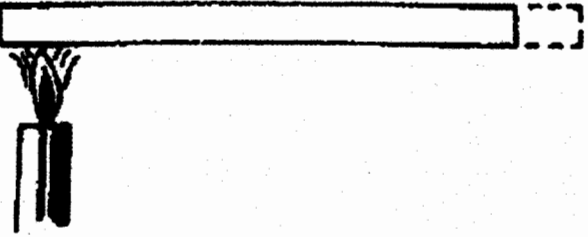
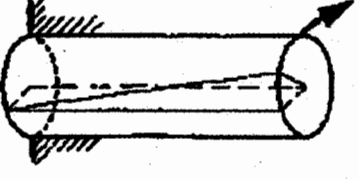
[12

Name the properties of materials exhibited by the actions shown in the Table 2 below.

Table 2. Properties of engineering materials

Action	Property being exhibited by the material
	
	
	
	

Action	Property being exhibited by the material
	
<p>Load 15, 30, 45 kg</p> 	
	
	
	
	


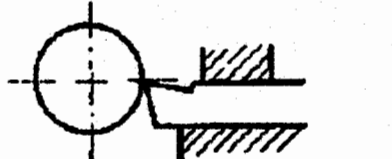
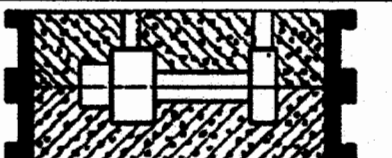
Action	Property being exhibited by the material
	
	

c) METHODS OF PRODUCTION

[3 marks]

State the method of solid metal formation in Table 3.

Table 3: Methods of producing solids.

Method of production	Name of procedure of solid metal formation
	
	
	

d) Discuss the advantages and limitations of using cold rolled steel as compared to hot rolled steel in agricultural workshops.

[10 marks]

SECTION II ANSWER ANY TWO QUESTIONS

QUESTION 2

- a) What features are used to fully describe a file? [3 marks]
- b) You have a farm workshop in rural Swaziland and there is no wire brush to clean the file. Explain how you would use common materials to protect the file from being quickly blocked by metal chips. [5 marks]
- c) Critically comment on the common workshop practice of sharpening cutting tools while repeatedly dipping them in a container of water [10 marks]
- d) Metals are commonly shaped by cutting.
 - i) What factors affect the penetration of cutting tools? [6 marks]
 - ii) How do the factors in i) above influence the life span of the tools and the quality of work produced? [6 marks]

QUESTION 3

- a) What hazard classifications compromise safety in an agricultural workshop? [8 marks]
- b) State two examples of each of the hazards in a) above. [8 marks]
- c) Distinguish between the different types of classes of fire that may be a hazard in an agricultural workshop. [6 marks]
- d) Suggest methods suitable for extinguishing the types of fires mentioned in c) above [8 marks]

QUESTION 4

- a) Describe two major types of joints used to assemble components together and give examples of where they are used. [8 marks]
- b) State advantages and disadvantages of each type of the joints above. [12 marks]
- c) Figure 1 shows vernier calliper used in measuring linear dimensions
 - i) State the dimensions being measured at a, b and c. [6 marks]
 - ii) The reading so obtained from such measurements is shown in Figure 1(b). What is the value of the reading? [4 marks]

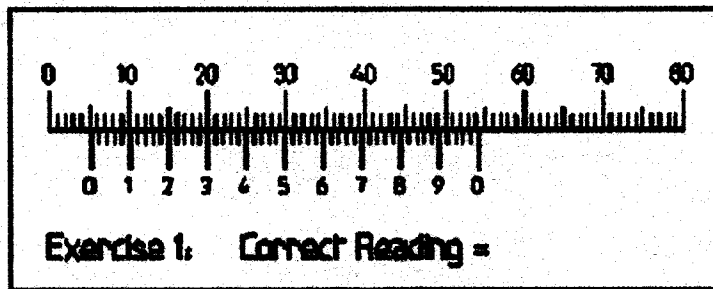
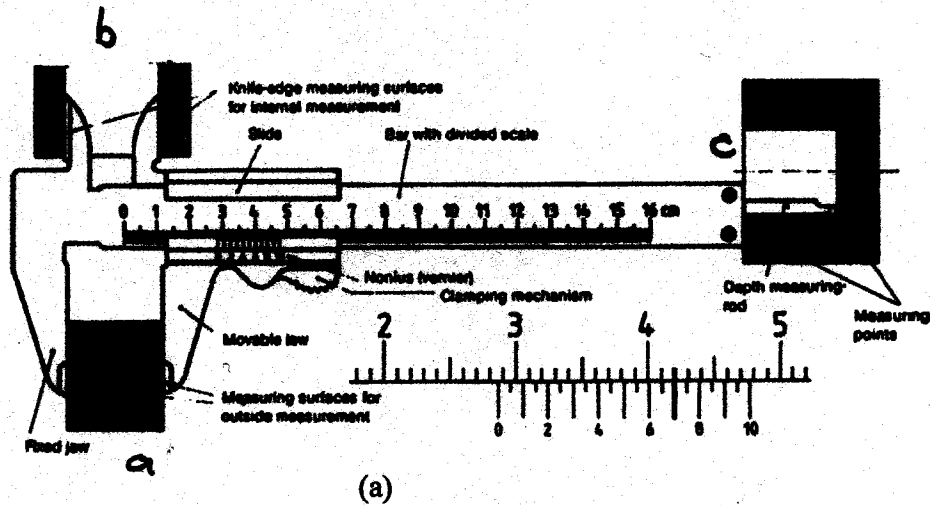


Figure 1 Vernier calliper and its measurements.