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UNIVERSITY OF ESWATINI
FINAL EXAMINATION PAPER

PROGRAMME: BSC ABE II

COURSE CODE: ABE204

TITLE OF PAPER: WORKSHOP TECHNOLOGY

TIME ALLOWED: TWO (2) HOURS

SPECIAL MATERIAL REQUIRED: NONE

INSTRUCTIONS: ANSWER QUESTION ONE BY FILLING IN THE SPACES PROVIDED AND ANY TWO OTHER QUESTIONS.

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SECTION I COMPULSORY

QUESTION 1 [40 MARKS]

a) TYPES OF MATERIALS

[15 marks]

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

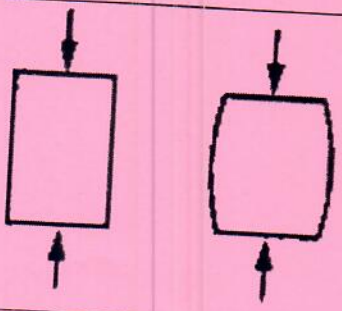
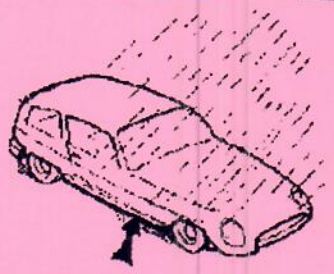
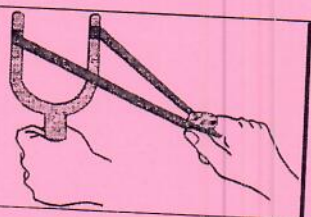
Table 1. Classifications of engineering materials

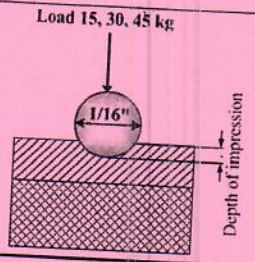
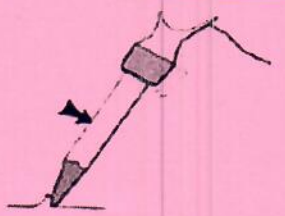
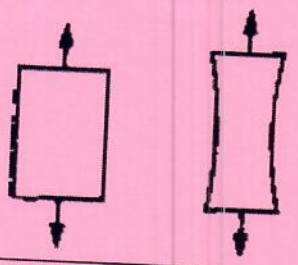
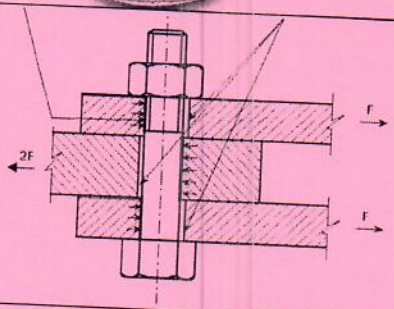
		Metals		Non−Metals	
		Ferrous Metal	**Nonferrous Metal**	**Natural Material**	**Artificial Material**
1	Wood				
2	Copper				
3	Leather				
4	Glass				
5	Ceramics				
6	Mild Steel				
7	Cast Iron				
8	Rubber				
9	Platic cup				
10	Stainless steel				
11	Iron ore				
12	Tin				
13	Cotton				
14	Aluminium				
15	PVC				

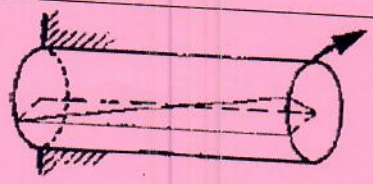
b) PROPERTIES OF MATERIALS [12 marks]

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

Table 2. Properties of engineering materials

	Action	Property being exhibited by the material
1		
2		
3		
4		
5		

	Action	Property being exhibited by the material
6		
7		
8		
9		
10		

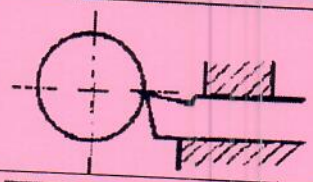
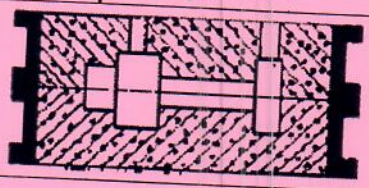
	Action	Property being exhibited by the material
11		
12		

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
1		
2		
3		

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

[10 marks]

SECTION IIANSWER ANY TWO QUESTIONS

QUESTION 2 [30 MARKS]

a) What features are used to fully describe a file? [6 marks]

b) What are the distinguishing features between a hand file and a flat file? [4 marks]

c) You have a farm workshop in rural Eswatini and there is no wire brush to clean the file.

i) What locally available material can you use to protect the file from being quickly blocked by metal chips during filing? [2 marks]

ii) Explain how the material minimises blocking of teething. [4 marks]

d) Explain the rational of sharpening cutting tools while repeatedly dipping them in a container of mineral oil or water. [6 marks]

e) What factors affect the penetration of cutting tools? [8 marks]

QUESTION 3 [30 MARKS]

a) What hazard classifications compromise safety in an agricultural workshop? [6 marks]

b) State two examples of each of the hazards in a) above. [6 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 [12 marks]

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QUESTION 4 [30 MARKS]

a) Distinguish between temporary and permanent joints. [4 marks]

b) The following elements are used to make common joints: glue, rivets, bolts and nuts, ropes, screws, solder, welding electrodes.

i) Classify them by type of joint [7 marks]

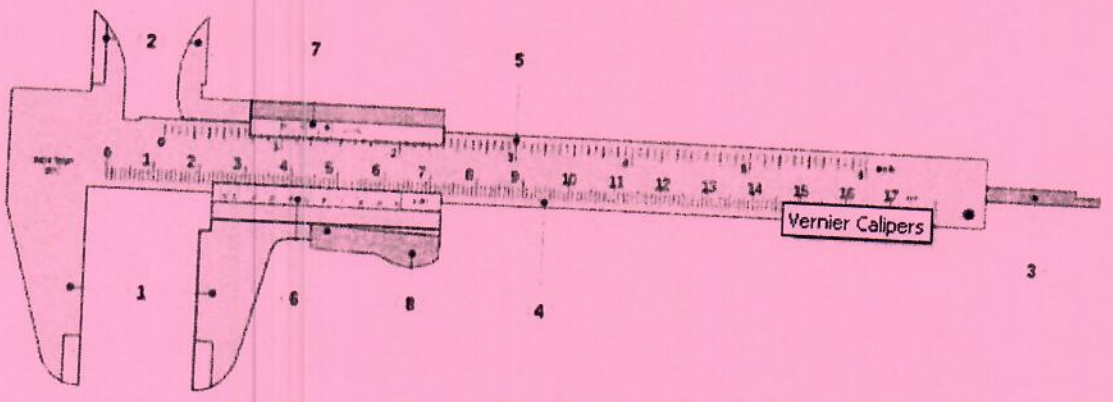
ii) Give an example of a product made using the above elements. [7 marks]

c) Figure 1(a) shows vernier calliper used in measuring linear dimensions .

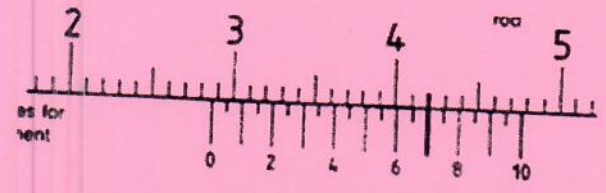
i) State the dimensions being measured at 1, 2 and 3. [6 marks]

ii) Name the readings 4, 6. [4 marks]

iii) The reading so obtained from such measurements is shown in Figure 1(b). What is the value of the reading? [2 marks]



(a)



(b)

Figure 1 Vernier calliper and its measurements.