NAME.....SCHOOL:.....

Candidate ..... Signature.....ADMISSION NO;.....

Date.....

BUNAMFAN EXAMINATION- 2021

DRAWING & DESIGN PAPER 1, Paper 449/1

DEC 2021 $2\frac{1}{2}$ Hour

You should have the following for this examination;

- Drawing instruments
- Drawing paper size A3

Write your name and index number in the spaces provided.

This paper consists of **three** sections **A, B** and **C.**

Answer **All** the questions in sections **A** and **B** and **any TWO** questions from section **C.**

Questions from section **A must** be answered in the provided **answer sheets.**

Questions in section **B** and**C** should be answered on the **A3** drawing paper provided.

All dimensions are in milimetres unless otherwise stated.

Candidates may be penalized for not following the instructions given in this paper.

	FOR EXAMINERS USE ONLY		
SECTION A;	**1 - 14**	$(^{x}/_{50})$	
SECTION B;	**15**	$(^{x}/_{20})$	
SECTION C;	**16 - 18**	$(^{x}/_{30})$	
TOTALS		$(^{xx}/_{100})$	

This paper consists of 10 printed pages.

Candidates should check the question paper to ensure that all the pages are printed as indicated and no questions are missing.

Turn Over

ANSWER ALL QUESTIONS IN SECTION A

1a. Explain briefly why models are necessary on a design solution `1 mark

b. State two types of engineering materials against each category below

i. ferrous metal

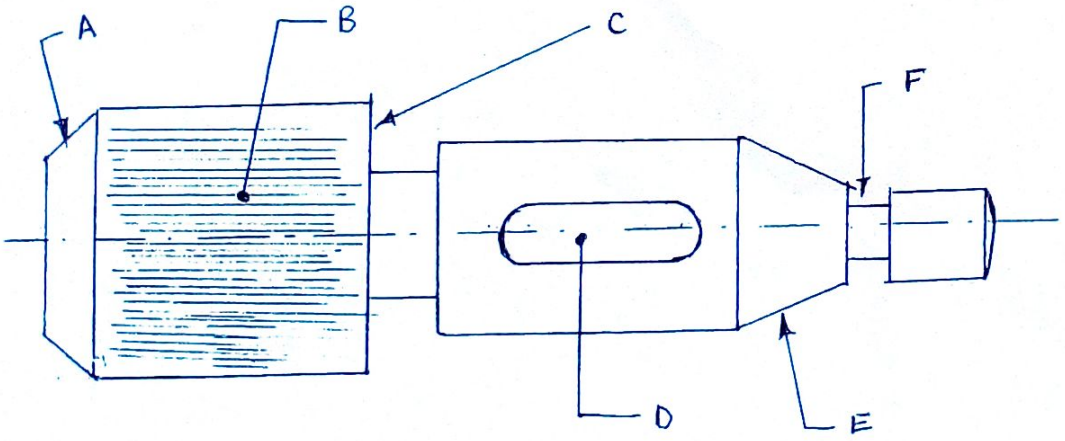
ii. non-ferrous metal

iii. plastics. 3marks

2a) State any three rules which govern dimensioning of engineering drawings.

(3mark)

b) Label the engineering figure given below A-F (3marks)



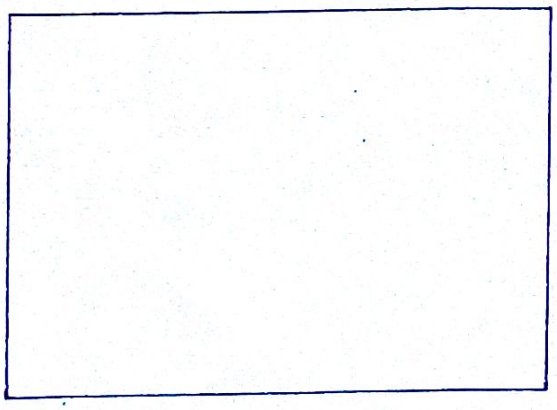
3 Sketch and state the use of the following machined screws applied in machine drawing. (3marks)

i. Cheese head screw

ii. Socket head screws

iii. Self- tapping screws.

4 Draw a parabola inside a rectangle given below. (4marks)



5 Construct a diagonal scale 50mm to 1M, 3M long to read to 0.1M. Use the scale to draw a triangle ABC. AB = 1M, AC = 1M, 30MM CB = 1M, 75 MM (5marks)

6 Construct a square equal in area to a given triangle ABC.

AB= 75mm, AC=62, and CAB=75.° (5marks)

7. State the purpose of each of the following drawing given below (3marks)

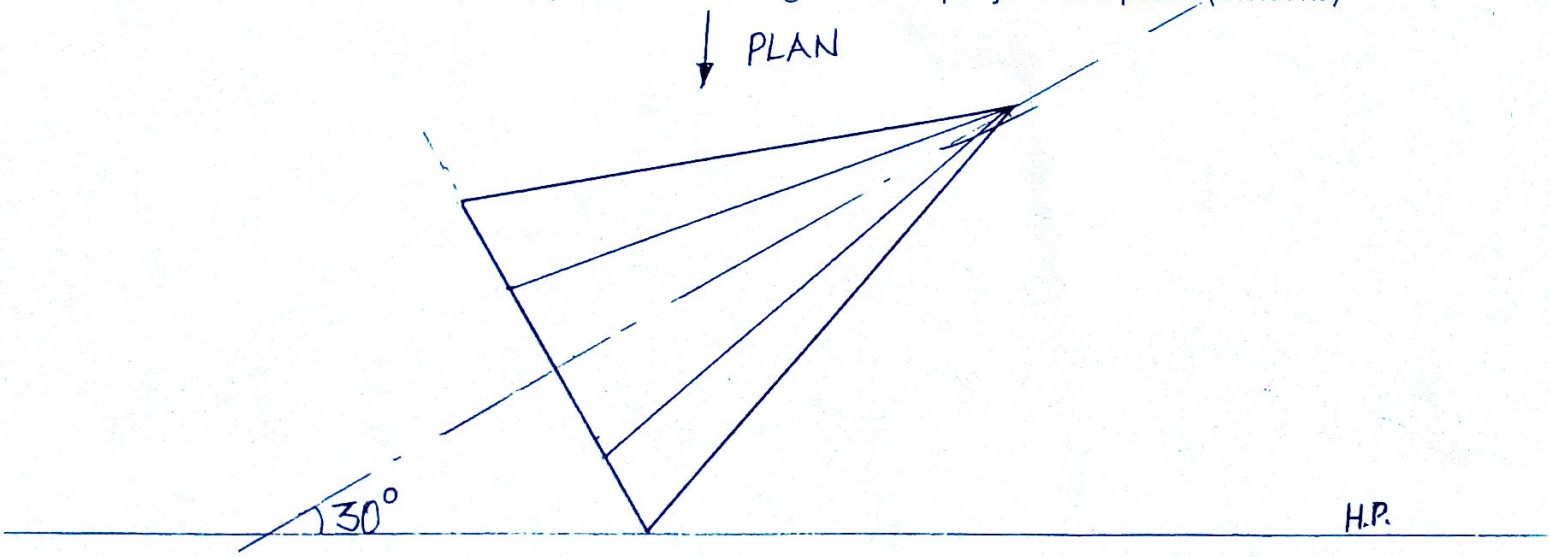
i. Assembly drawing

ii. Exploded drawing

iii. Working drawing

8. Drawing an involutes of a hexagon whose sides are 20mm. (4marks)

9. A hexagonal pyramid of base side 30mm and axis length 60mm is resting on horizontal plane (HP) on one of its base corners with its axis inclined at 30° to horizontal plane (HP). Copy the elevation given and project the plan. (3marks)



10) Use neat sketches to show the effect of carbon on plain steel in (3marks)

i) Hardness

ii) Ductility

iii) Tensile strength

SECTION B (30MARKS)

This question is compulsory candidates are advised to spend not more than one hour on this question.

11. The figure EX 22.5 shows details of the bearing bracket and pulley. Assemble the parts and draw full size of the following views in. third angle

(a) A sectional End elevation along the cutting plane X-X

(b) Front elevation in the direction of arrow A

(c) Prepare the list part of the materials assembled.

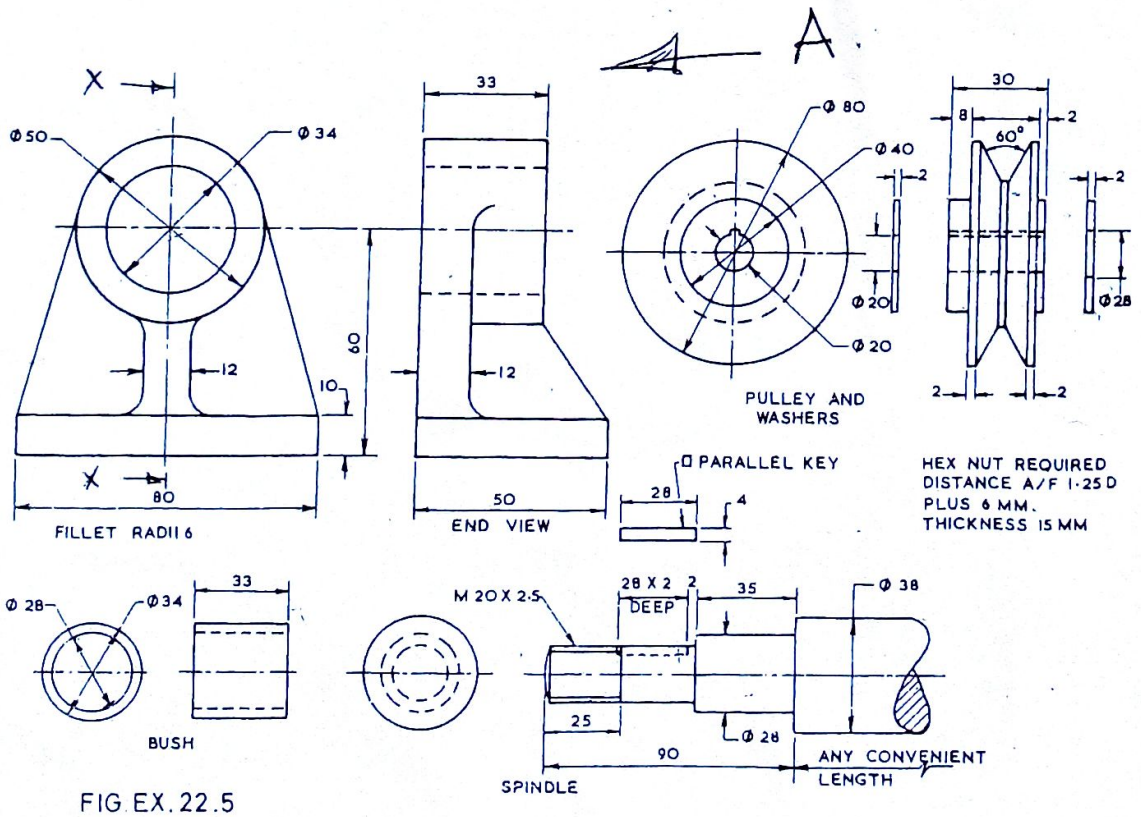
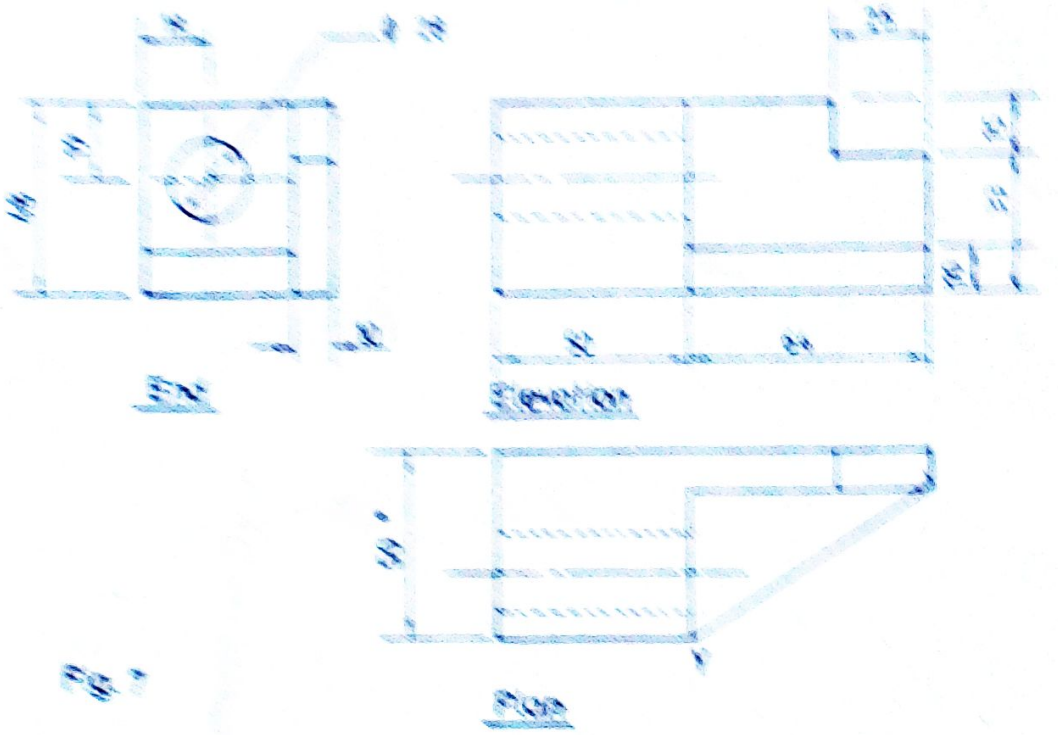


FIG EX. 22.5



13. Figure 4 shows an isometric drawing of a castor wheel. Draw full size the following view in first angle orthographic projection. (15marks)

(a) Front elevation viewed in the direction of arrow A.

(b) End elevation in the direction of arrow B

(c) Plan

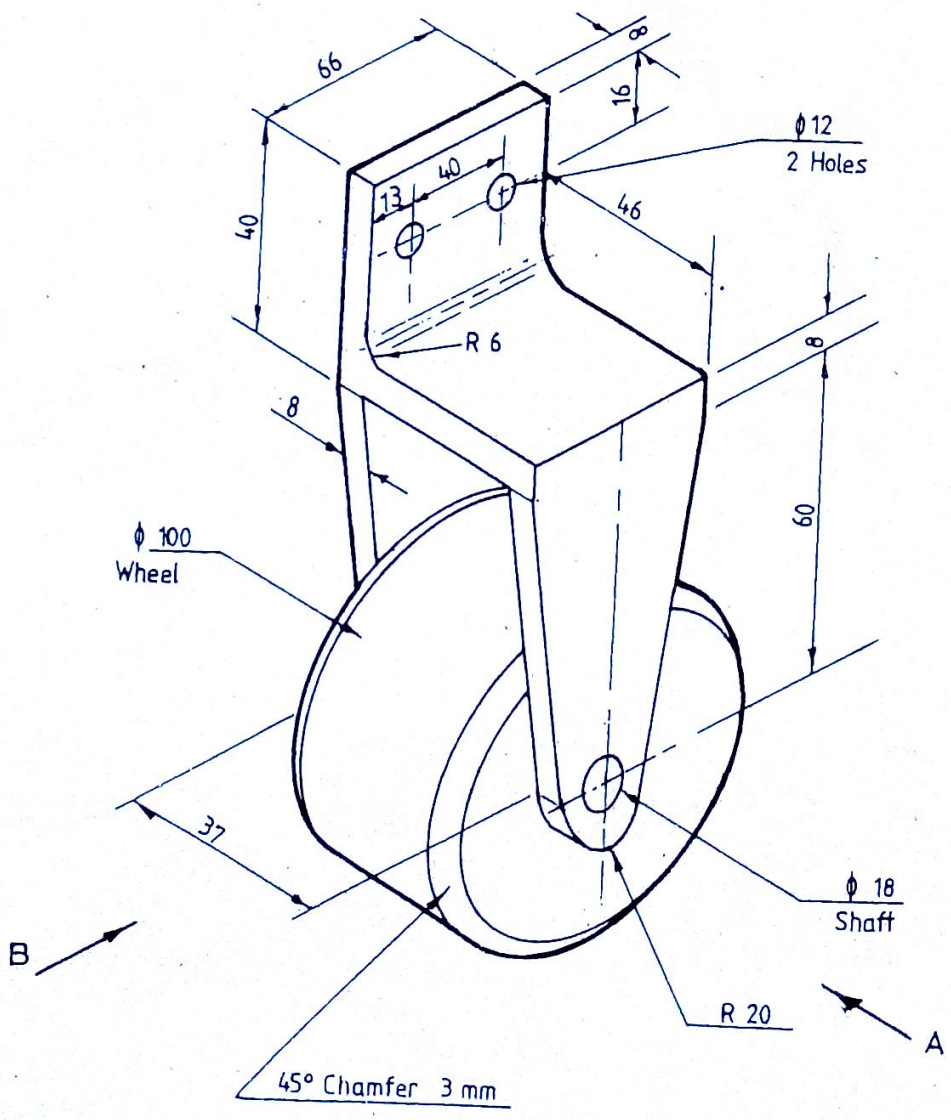


Fig. 4

14. The figure below shows a junction of three intersecting equal pipes and off-set joint. Copy the diagrame and draw the development of the mid-pipe A. (15 marks)