

449/2

**DRAWING AND DESIGN**

**Paper 2**

**(PRACTICAL)**

**DEC, 2021**

2 ½ hours

**BUNAMFAN EXAM, 2021**

**Form four**

**Instructions to candidates**

- (a) You should have the following for this examination:
- 4 sheets of drawing paper size A3;
  - Drawing instruments.
- (b) This paper has ONE COMPULSORY question.
- (c) This paper is to be issued to the candidates 30 minutes before the examination starts.
- (d) The candidates are advised to spend this time understanding the design problem and Planning the work on one of the drawing papers provided.
- (e) This paper consists of 2 printed pages.
- (f) Candidates should check the question paper to ascertain that all the pages are printed As indicated and that no questions are missing.
- (g) Candidates should answer the questions in English.

### DESIGN PROBLEM: (40 marks)

With the increase in use of desk top computers, schools have a challenge of effective utilization of space both as classrooms and computer laboratories. This has led to high maintenance costs, caused by frequent movements of the equipment.

Design a computer desk considering the following:

- (i) It should accommodate the monitor, central processing unit, keyboard and the mouse;
- (ii) It should be uses for other learning activities;
- (iii) There should be minimal movement of components in (I) above;
- (iv) The components should be safely stored when not in use.

### REQUIREMENTS

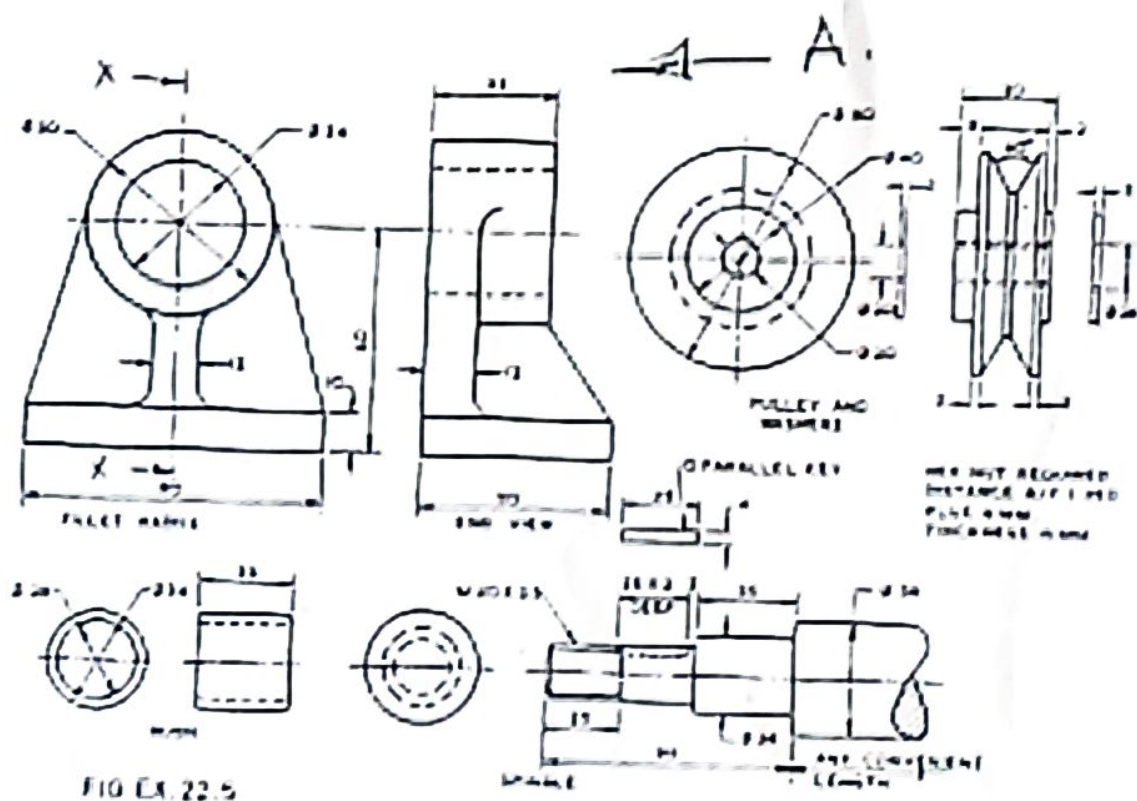
- (a) Make freehand sketches of **TWO** possible designs. (8 marks)
- (b) Select **ONE** of the designs in (a) above and make a refined labeled pictorial sketch. (12 marks)
- (c) Draw detailed exploded views of the mechanisms in considerations (iii) and (iv) above (12 marks)
- (d) List **FOUR** different materials used and state **ONE** reason for the choice of each. (6 marks)
- (e) Give **FOUR** possible methods of finishing the desk. (2 marks)

**SECTION B (30 MARKS)**

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.



SECTION C (30 marks)

Answer any two questions from this section.

- 12 Figure 7 shows the three views of a machined block drawn in first angle projection. Draw, FULL SIZE, the block in Isometric projection taking corner "Y" as the lowest point (15 marks)

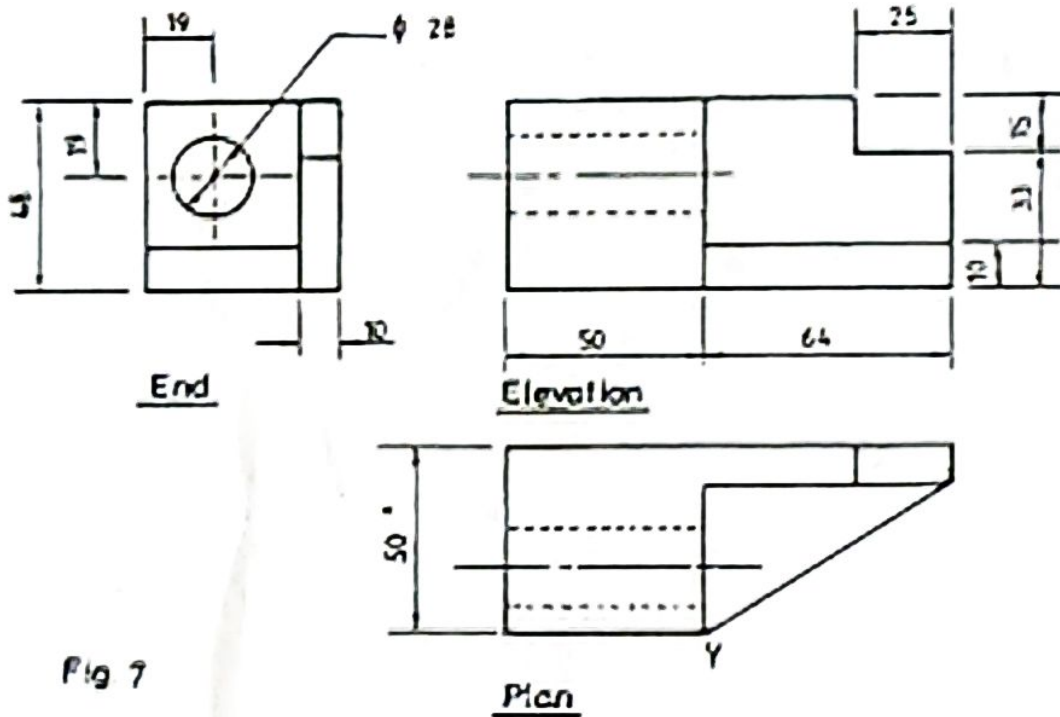


Fig 7

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

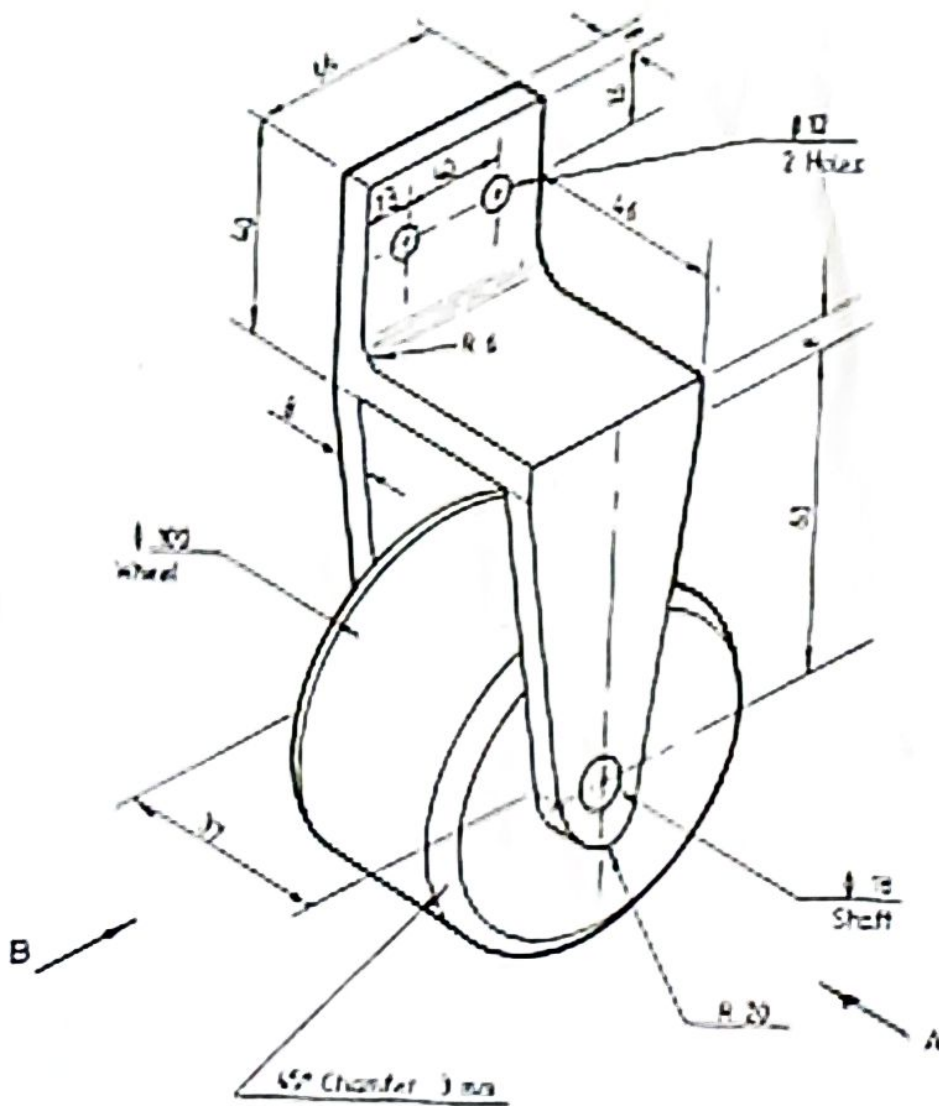
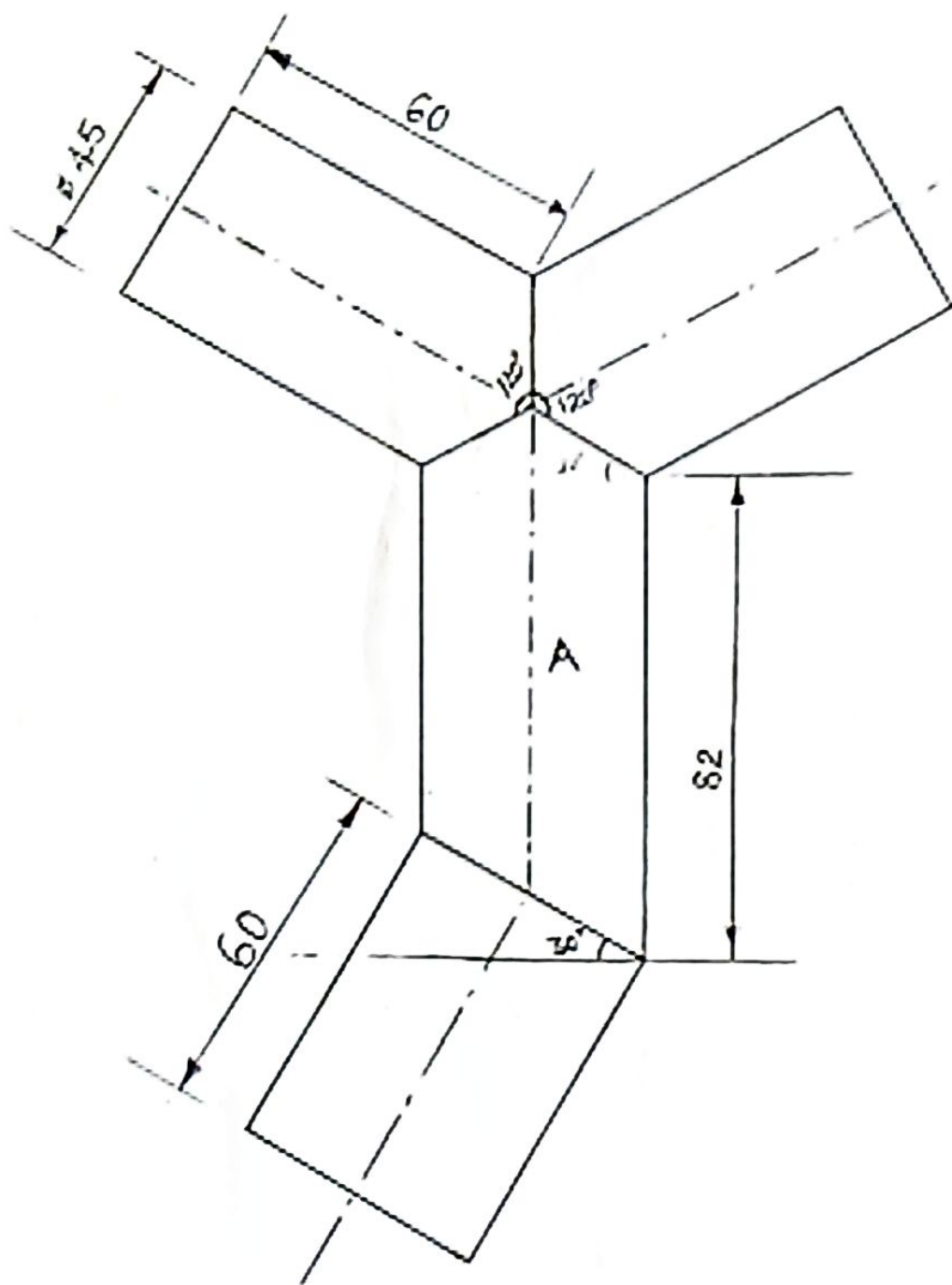


Fig. 4

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



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 millimetres unless otherwise stated.

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

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

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**

1 a. 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.

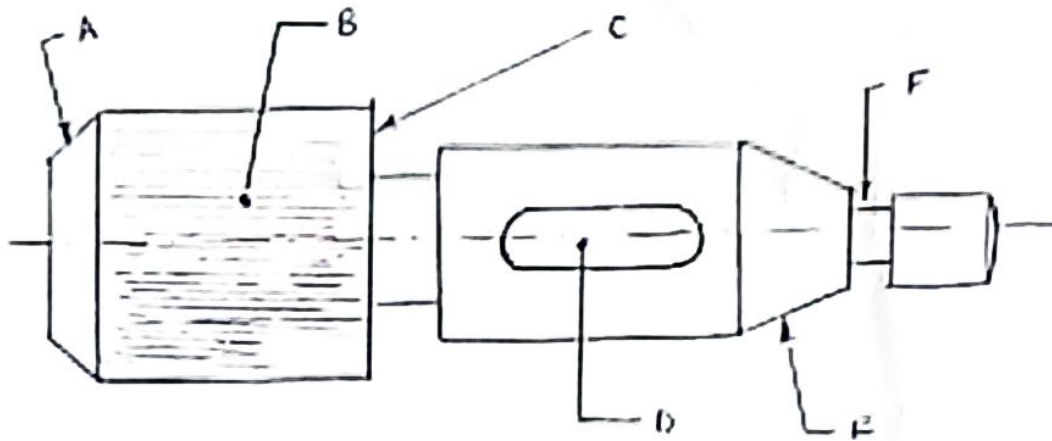
3marks



2.) State any three rules which govern dimensioning of engineering drawing;

(3mark)

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



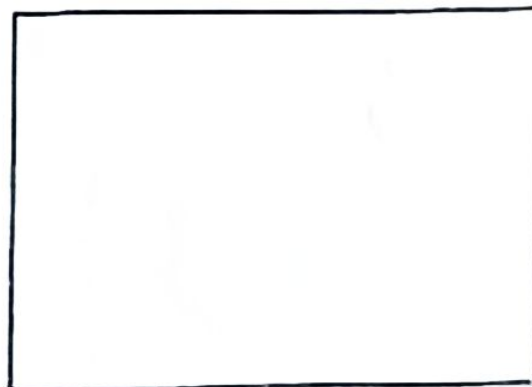
3 Sketch and state the use of the following machined screws applied in machine drawing. (3marks)

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

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

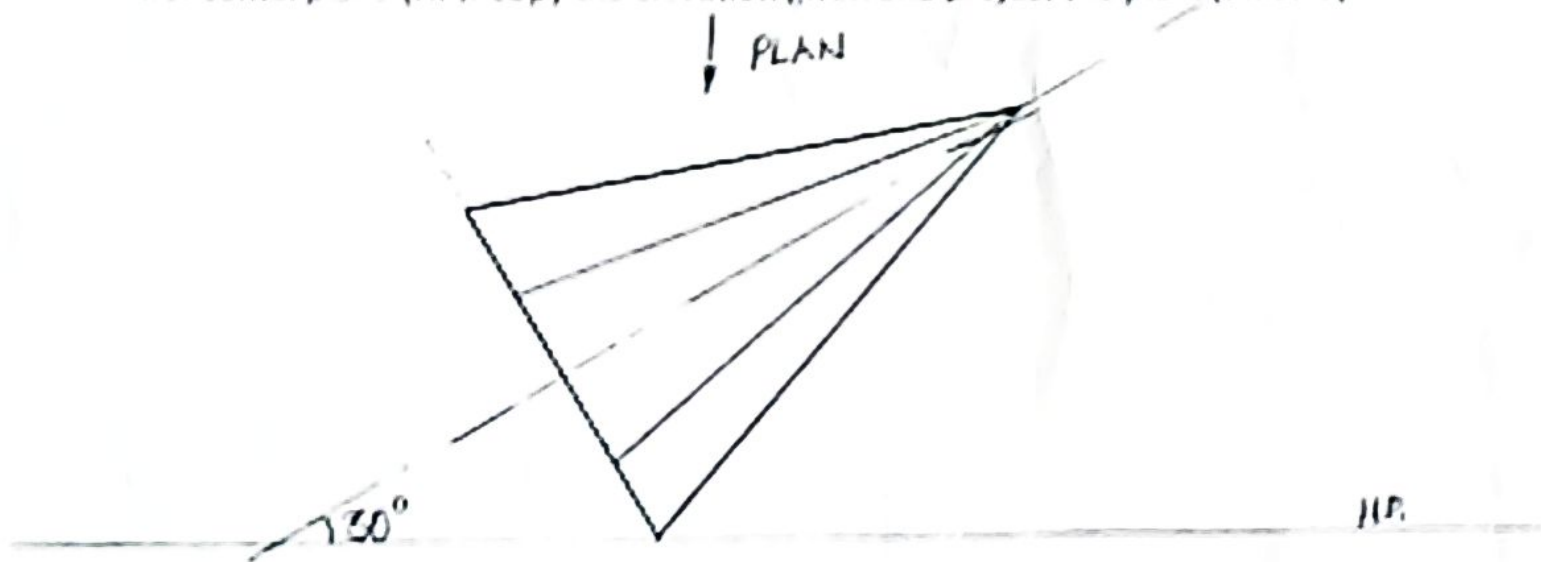
AB = 75 mm, AC = 62, and  $\angle C = 75^\circ$  (5 marks)

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

- 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  $30^\circ$  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