Hillcrest High School

GRADE 11 – ENGINEERING GRAPHICS AND DESIGN EXAM

PAPER 2

November 2017

TIME: 3 hours

Examiner: Mrs Tonkin

TOTAL: 200 marks

Moderator: Mrs Moodley

NB: READ THE INTRUCTIONS

1. This paper consists of 6 pages, and 4 questions.
2. Answer ALL questions.
3. Take note of the mark allocation in each question.
4. The questions must be answered on the answer sheets provided.
5. All the answer sheets must be re-stapled in NUMERICAL sequence and handed in irrespective of whether the question was attempted or not.
6. Time management is essential in order to complete all the questions.
7. Print your Name and Surname in the block provided on EVERY answer sheet.
8. All answers must be drawn accurately and neatly.
9. Any details or dimensions not given must be assumed in good proportion.

Question		Learner Mark	Mark Allocation
1	Mechanical Analytical		30
2	Cam		45
3	Isometric		39
4	Mechanical Assembly		86
	TOTAL		200

Name:
Teacher:

ASSEMBLY DRAWING 4

The figure shows the Third Angle Orthographic views and the Exploded Assembly view, of the components of a **BRACKET AND BASE ASSEMBLY**.

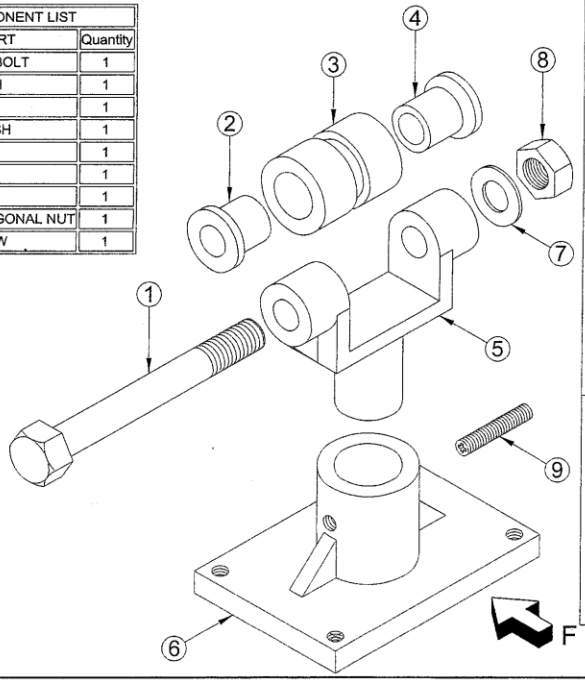
Draw the following on the Answer Sheet provided :

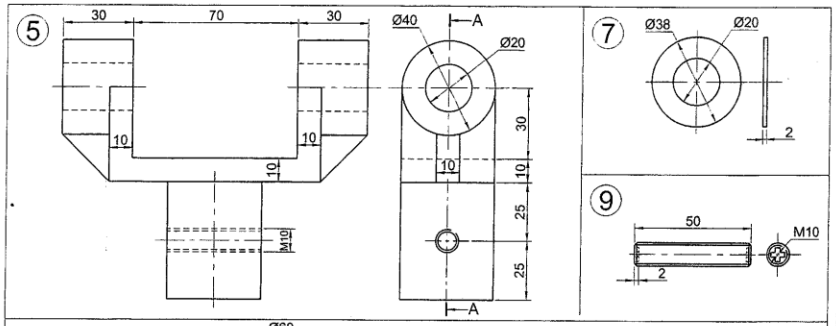
4.1 A **Sectional Front View**, on the cutting plane A-A, of the assembled components, as seen in the direction of F;

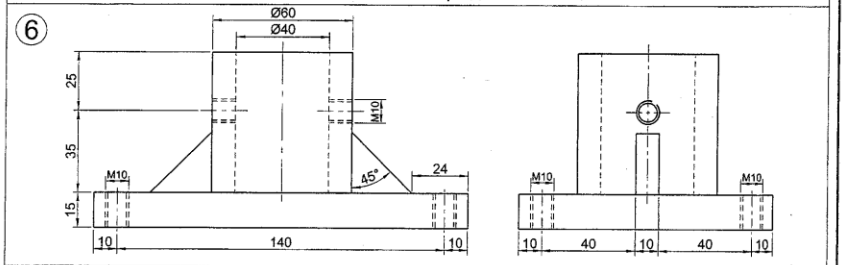
4.2 An **Outside Right View** of the assembled components.
Show all hidden detail in this view.

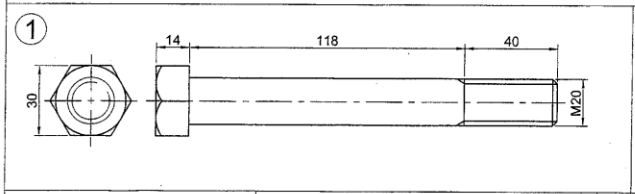
- Use a Scale 1:1.
- Show the bolt & nut construction.
- Print the title, scale and heading.
- Draw the projection symbol.
- Show 3 faces for the M20 hexagonal nut.
- Show 2 faces for the M20 hexagonal bolt.

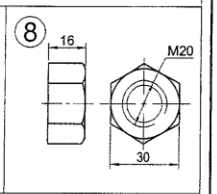
COMPONENT LIST		
No	PART	Quantity
1	M20 HEX. BOLT	1
2	LEFT BUSH	1
3	ROLLER	1
4	RIGHT BUSH	1
5	BRACKET	1
6	BASE	1
7	WASHER	1
8	M20 HEXAGONAL NUT	1
9	M10 SCREW	1

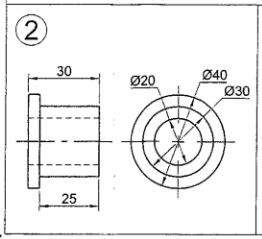


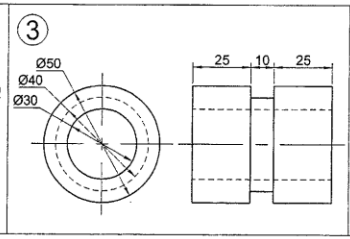


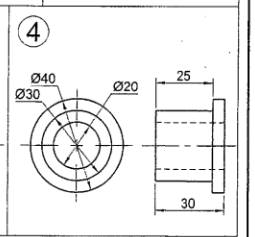












QUESTION TWO : CAMS

A disc cam rotates with uniform velocity in a clockwise direction, and transmits the following motion to a wedge-ended follower which reciprocates along the vertical centre line of the cam shaft.
During the first 30° rotation the follower is at rest;
During the next 75° rotation the follower rises 70mm;
During the next 30° rotation the follower is at rest;
During the next 45° rotation the follower drops 45mm;
During the next 30° rotation the follower is at rest;
During the next 60° rotation the follower rises 25mm;
During the next 30° rotation the follower is at rest;
During the last 60° rotation the follower returns to its original starting position.

Cam Shaft Diameter = 26mm
Minimum distance from the centre of the cam shaft to the profile = 20mm.
Follower diameter = 10mm

► Draw the Graph of Displacement (Scale 8mm : 30°).
► Draw the profile of the cam that is generated.

ASSESSMENT CRITERIA			
1	GRAPH	13	
2	MCP,FF,DIRECT., SHAFT, CL, LABELS	8	
3	CAM PROFILE	14	
4	CURVE / PROJECTION	10	
	TOTAL	45	

Name:

ASSESSMENT CRITERIA		
SECTION A-A		
BOLT	6½	
BUSH	6	
ROLLER	6	
BRACKET	10	
BASE	5	
WASHER	2	
NUT	5	
SCREW	3	
HATCHING	10	
TOTAL	**53½**	
RIGHT VIEW		
BOLT SHAFT	1	
ROLLER	1	
BRACKET	2½	
BASE	5	
WASHER	1	
NUT	2	
SCREW	3	
CUTTING PLANE	2	
TOTAL	**17½**	
ASSEMBLY		
ASSEMBLY	6	
CENTRE LINES	5	
LABEL & SCALE	2	
SYMBOL	2	
TOTAL	**15**	
TOTAL	**86**	

Name:

QUESTION THREE : ISOMETRIC

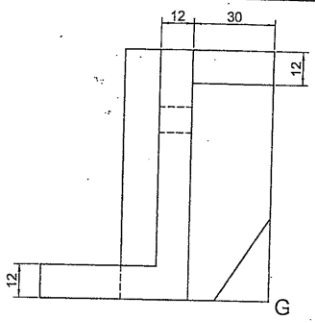
Given:

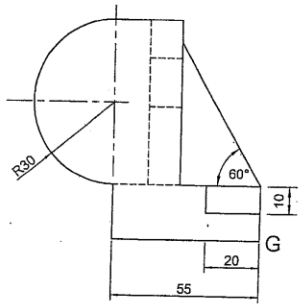
- The Front view, Top view and Right view of a BRACKET SUPPORT
- The position of point G on the drawing sheet

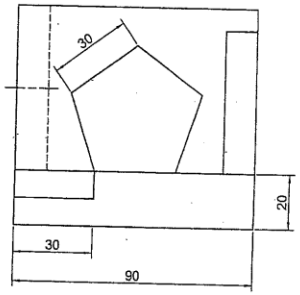
Instructions:

Using scale 1:1, convert the orthographic views of the BRACKET SUPPORT into an Isometric drawing.

- Make G the lowest point of the drawing.
- Show ALL necessary construction.
- NO stencils may be used.
- NO hidden detail is required.







G

ASSESSMENT CRITERIA						
1	Non - Isometric	4				
2	Isometric Lines(24/2)	12				
3	Pentagon	6				
4	Isometric circle	9				
5	Auxiliary Views & CL	8				
	TOTAL	39				

Name: