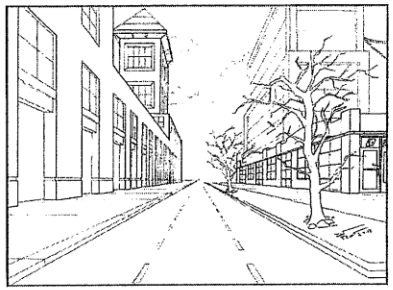
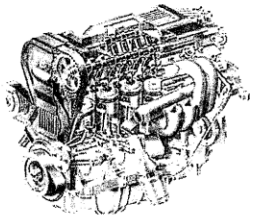
HILLCREST HIGH SCHOOL

ENGINEERING GRAPHICS AND DESIGN EXAM

NOVEMBER EXAM





GRADE 11
2018
PAPER 2

TIME: 3 hours
Examiner: Mrs Tonkin

MARKS: 200
Moderator: Mr Victor

NB: READ THE INTRUCTIONS

1. This paper consists of **6 pages** including the cover page 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 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.

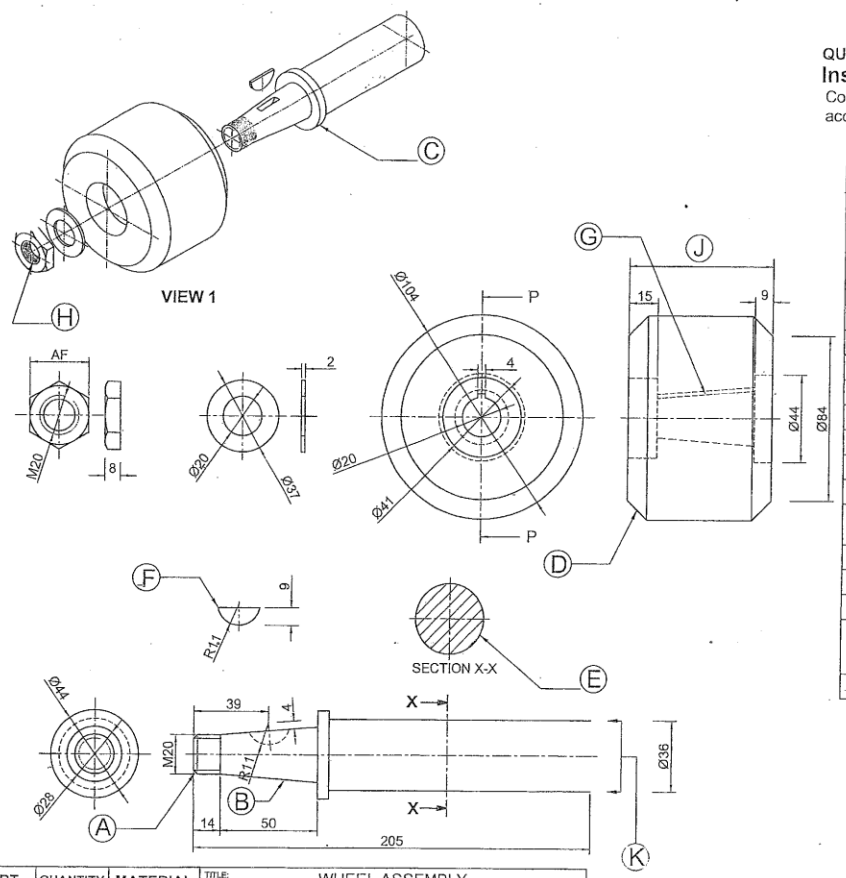
QUESTION	SECTION	MARK	MODERATE	MAXIMUM
1	MECHANICAL ANALYTICAL			20
2	LOCI - CAM			36
3	ISOMETRIC			39
4	MECHANICAL ASSEMBLY			105
	TOTAL			**200**
	SYMBOL			**100**

NAME:
TEACHER:

QUESTION ONE : ANALYTICAL

Instructions:

Complete the table below by neatly answering the questions, which all refer to the accompanying detailed drawings and the title block.



	QUESTIONS	ANSWERS	
1	What is the scale of the Drawings ?		½
2	What is the Drawing number ?		½
3	From what material is the axle made ?		½
4	Provide a suitable title for VIEW 1.		1
5	At what angle is the feature at A drawn ?		1
6	Identify the feature at B.		1
7	Identify the feature at C.		1
8	Identify the feature at D.		1
9	Identify the type of section shown at E.		1
10	Identify the type of key shown at F.		1
11	Identify the feature at G.		1
12	Identify the feature shown at H on the hexagonal nut.		1
13	What is the function of feature C on the shaft ?		1
14	Determine the dimension of the wheel shown at J.		2
15	Calculate the distance across flats (AF) of the nut.		2
16	Draw, freehand, an S-Break at the end of shaft at K.		2½
17	Complete the Third Angle Orthographic Projection, by inserting the missing Front View, using instruments.		2
	TOTAL		20

PART	QUANTITY	MATERIAL
NUT	1	MILD STEEL
WASHER	1	SPRING STEEL
WHEEL	1	RUBBER
KEY	1	MILD STEEL
AXLE	1	STEEL

TITLE: WHEEL ASSEMBLY

DRAWN: RAVI — DATE: 17-09-15 — CAD: AutoCAD 2015

CHECK: GARY — DATE: 25-09-15 — DWG NO: DoE-NOV-007-2015

ENGINEER: CHAV

REVISION: 02

SCALE:

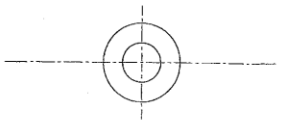
WHEELS GALORE Est. 1964 Phoenix

19 Chanes Drive
Clare Estate
Durban

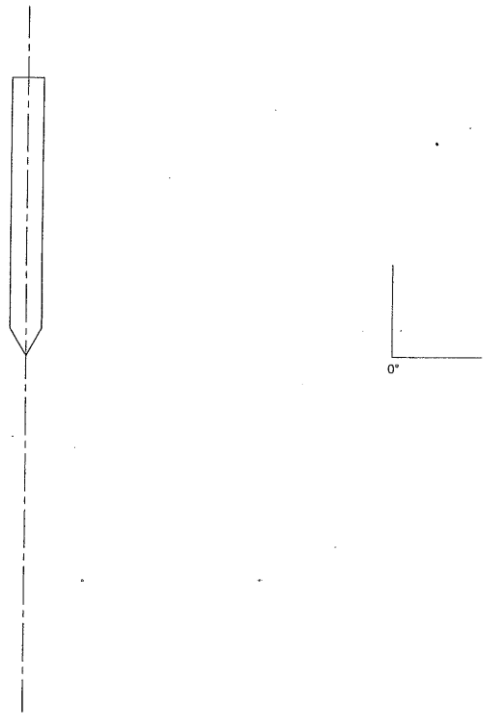
www. designalot.co.za

Answer 16

Answer 17



NAME : _____ GR. _____



QUESTION 2: CAMS

Given:
- The position of the wedge-ended follower.
- Starting point for the graph of displacement.
- Vertical centre line of the cam shaft.

Specifications:
- The minimum distance from the cam profile to the centre of the shaft = 10 mm
- Cam shaft diameter = 10 mm
- Rotation = anti-clockwise
- Vertical scale = 1 : 1
- Horizontal scale = 10mm = 30°

Movement of the follower:
- Over the first 60° the follower rises 36mm with uniform motion.
- Over the next 30° the follower is at rest.
- Over the next 90° the follower rises with uniform motion to a total height 70mm.
- Over the final 180° the follower returns to its original position with uniform motion.

Instructions:

2.1 Draw and label the graph of displacement using the specifications given.

2.2 Draw the profile of the plate cam for the above movement of the follower.

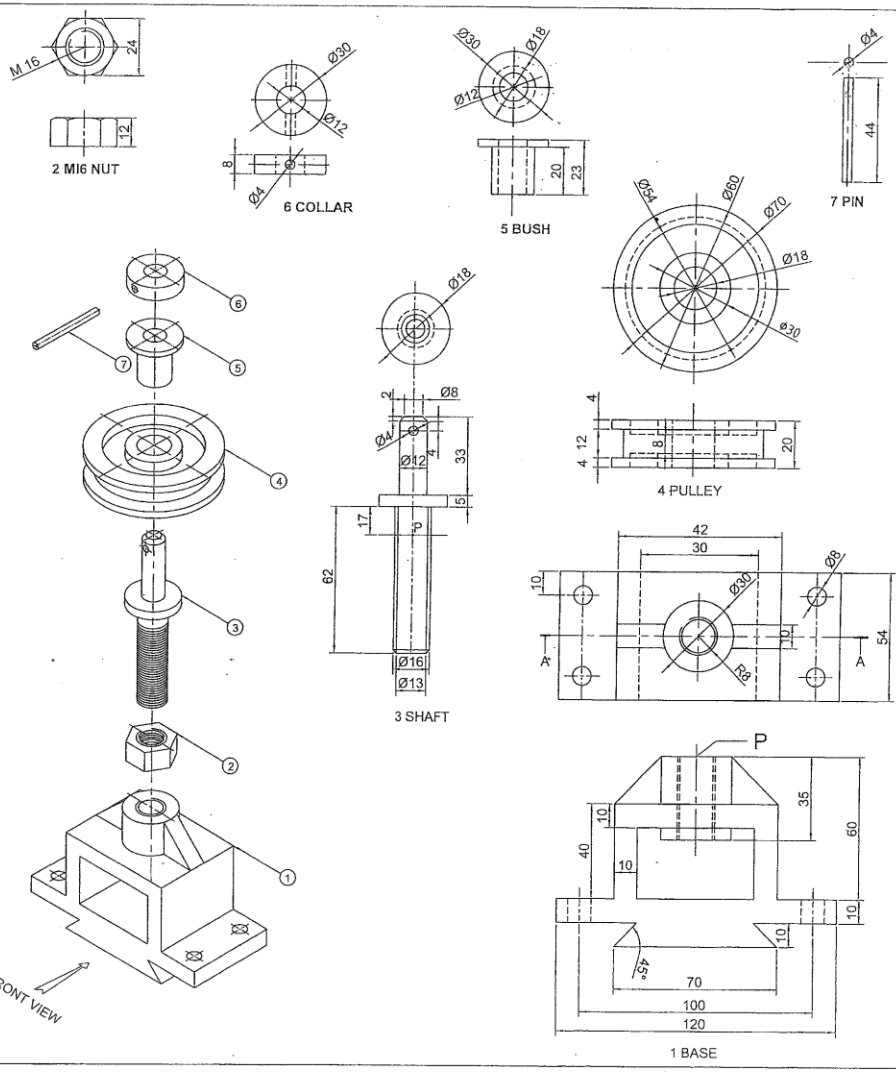
2.3 Draw the camshaft in position.

2.4 Show centre lines and the direction of rotation of the cam.

[36]

ASSESSMENT CRITERIA					
1	GRAPH OF DISPLACEMENT	10			
2	CONSTRUCTIONS	3			
3	MIN. DIST. C/LINES & ARROW	5			
4	PLOTTING	12			
5	CURVE	6			
	TOTAL	36			

NAME : _____ GR. _____



QUESTION 4: MECHANICAL ASSEMBLY

Given:

- The exploded isometric drawing of the parts of a pulley tensioner, showing the position of each part relative to all the others.
- Ortographic views of each of the parts of the pulley tensioner

Instructions:

- Answer this question on page 6
- Draw, to scale 1:1 and in third- angle orthographic projection, the following views of the assembled parts of the pulley tensioner assembly:

4.1 A sectional front view, on cutting plane A-A, as seen from the direction of the arrow shown on the exploded isometric drawing. The cutting plane is shown on the top view of the base (part 1).

4.2 The top view.

- All drawings must comply with the gidelines contained in the SABS 0111.

NOTE;

- Point P on the shaft , nut and base must correspond.
- No hidden detail is required.

Add the following features to the drawing:

- The cutting plane A-A
- Label the sectional view : SECTION A-A

PARTS LIST		
PART	QUANTITY	MATERIAL
1 BASE	1	CAST IRON
2 M16 NUT	1	MILD STEEL
3 SHAFT	1	HARDENED STEEL
4 PULLEY	1	CAST IRON
5 BUSH	1	BRONZE
6 COLLAR	1	MILD STEEL
7 PIN	1	MILD STEEL

QUESTION 4: MECHANICAL ASSEMBLY

ASSESSMENT CRITERIA			
TOP VIEW			
1	BASE	12	
3	SHAFT	2	
4	PULLEY	2	
6	COLLAR	1	
7	PIN	6	
8	SECTION A-A	3	
9	CENTRE LINE	8	
10	HATCHING	13	
SUBTOTAL		47	

ASSESSMENT CRITERIA			
SECTIONAL FRONT VIEW			
1	BASE	13	
2	M 16 NUT	5	
3	SHAFT	15	
4	PULLEY	14	
5	BUSH	4	
6	COLLAR	2	
7	PIN	1	
8	LABEL	2	
	THIRD ANGLE	2	
SUBTOTAL		58	
TOTAL		105	