



TECHNICAL UNIVERSITY OF MOMBASA
**Faculty of Engineering &
Technology**

DEPARTMENT OF MECHANICAL & AUTOMOTIVE ENGINEERING

DIPLOMA IN AUTOMOTIVE ENGINEERING
(DAE Y3 S2)

EAU 2305: MOTOR VEHICLE DRAWING & DESIGN II

END OF SEMESTER EXAMINATION

SERIES: AUGUST 2014

TIME: 2 HOURS

Instructions to Candidates:

You should have the following for this examination

- *Answer Booklet*

This paper consists of **FIVE** questions.

Answer **TWO** Questions from Section **A** and **ONE** Question from Section **B**.

Maximum marks for each part of a question are as shown

This paper consists of **THREE** printed pages

SECTION A: (Answer TWO Questions only)

Question One

- a) Illustrate the following types of drives:
- (i) Cam and flat follower
 - (ii) Cam and roller follower
- (4 marks)**
- b) Figure 1 shows a radial plate cam profile. Draw full size, the given profile and hence construct the displacement diagram, assuming a knife-edge follower. Also estimate the maximum lift of the follower for the conditions given.
- (16 marks)**

Question Two

- (a) A vehicle employing Ackermann's steering geometry has the front right-hand wheel turned 20° to the left. If the vehicle has the following specifications:

Ackermann's angle 31°
Kingpin centre distance 1200mm
Length of each stub axle 120mm
Length of steering arms 180mm

- (b) Using a scale of 1:20 draw the steering layout and determine the following:
- a) Length of track rod
 - b) Wheel base
 - c) Angle turned by the left-hand wheel
 - d) Minimum radius of turn (assuming this is left-hand lock)
 - e) Track
- (20 marks)**

Question Three

Construct the profile of a single-start left-hand square thread with major diameter 60mm and pitch 24mm, scale 1:1. **(20 marks)**

SECTION B : (Answer ONE Question only)

Question Four

Sketch and label the following and indicate the direction of flow of fluid:

- a) Single-stage three-element torque converter **(10 marks)**
- b) Power-assisted steering system **(10 marks)**

Question Five

Sketch a D.P.A injection pump fuel circuit and illustrate the fuel flow. Label all parts. **(20 marks)**