



# TECHNICAL UNIVERSITY OF MOMBASA

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FACULTY OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF MECHANICAL & AUTOMOTIVE ENGINEERING

**UNIVERSITY EXAMINATION FOR:**

DIPLOMA DMEN 03

EAU 2101: MOTOR VEHICLE THEORY

END OF SEMESTER EXAMINATION

**SERIES:** APRIL 2016

**TIME:** 2 HOURS

**DATE:** Pick Date May 2016

## Instructions to Candidates

You should have the following for this examination

-Answer Booklet, examination pass and student ID

This paper consists of **FIVE** questions. Attempt any **THREE** questions.

**Do not write on the question paper.**

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Q1.

a) Define the term chassis and give **THREE** of its functions as used in vehicle technology (5mks)

b) Explain the following types of chassis

i. Full-forward chassis

ii. Frame- full chassis

iii. Frameless chassis (6mks)

c) State the advantage of each of the sections used in chassis construction (3mks)

d) Explain the following types of chassis frames

i. Space frame

ii. Torsion box

iii. Monococque (6mks)

Q.2

a) With the aid of a well labeled diagram, explain the following types of vehicle layouts

i. Front engine- front- wheel drive

ii. Rear engine- rear-wheel drive

iii. All -wheel-drive (6mks)

b) List any FOUR components of a four wheel drive (4mks)

c) Explain the working principle of a part-time 4WD system (4mks)

d) Give ONE advantage and ONE disadvantage of each of the layouts below

i. Front engine-front wheel drive

ii. Front engine- rear wheel drive

iii. Four wheel drive (6mks)

Q.3

a) Explain the working principle of the following suspension systems

i. Rigid suspension

ii. Independent suspension (4mks)

b) List TWO functions of a suspension system as used in vehicles (2mks)

c) Explain any TWO types of front suspension systems (4mks)

d) With the aid of a diagram explain the working principle of a shock absorber (4mks)

e) Explain THREE factors which indicate that the suspension system needs replacement (6mks)

Q.4

a) Explain the working principle of the following types of safety gadgets used in vehicles (6mks)

i. Anti- locks Braking System (ABS)

ii. Electronic Stability Control (ESC)

b) List FOUR components of a lead- acid battery (4mks)

c) Define the following terms as used in capacity rating system

- i. Reserve Capacity (RC)
- ii. Cold Cranking Amps (CCA) (4mks)

d) With the aid of a diagram explain the reactions taking place in a lead acid battery during

- i. Charging
- ii. Discharging (6mks)

Q.5

a) Explain FOUR terms used in tyre designation (4mks)

b) Name THREE materials used in tyre construction (3mks)

c) Give FOUR functions of tyres in vehicles (4mks)

d) Explain the following types of carcass (tread) used in vehicle wheel construction (6mks)

- i. Cross ply
- ii. Radial ply
- iii. Belted bias ply

e) List THREE factors affecting tyre service life (3mks)