

CAMEROON GENERAL CERTIFICATE OF EDUCATION BOARD	SUBJECT CODE NUMBER 00-6001-E	SERIES/SPECIALTY Automobile Repair Mechanics (MA), Sheet- Metal and Metallic Construction (MF-CM)
Examination Probatoire De Brevet de Technicien Examination	SUBJECT TITLE Applied Mechanics - Syllabus E	
Date of Examination Thursday 26-05-2016 TYPE OF EXAMINATION WRITTEN	SESSION JUNE 2016	

Duration: 14:00 - 16:00
Coefficient: SEE INSIDE

ANSWER BOOKLET

NOTE:

1. Open wide this cover page of the booklet and enter the information required in the boxes provided overleaf.
2. Answer ALL questions, using the spaces provided
3. Write your answers in blue or black ink. The use of pencil is NOT allowed except specifically required for drawings, graphs and others.
4. Where the questions are on pages that are separate from the pages bearing the spaces meant for answers, you may tear off the pages containing the questions using a straightedge ruler.

**NO OTHER ANSWER BOOKLET IS REQUIRED FOR THIS SUBJECT.
WRITE ALL YOUR ANSWERS INSIDE THIS BOOKLET**

Turn Over

III-A STATICS STUDY

A-1- Equilibrium of the arm 5:

F.P.S. :

.....

.....

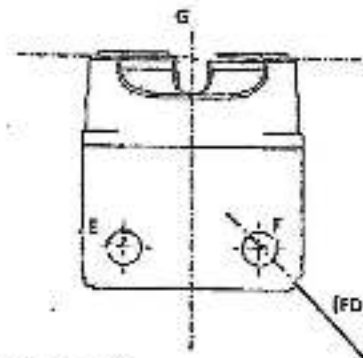
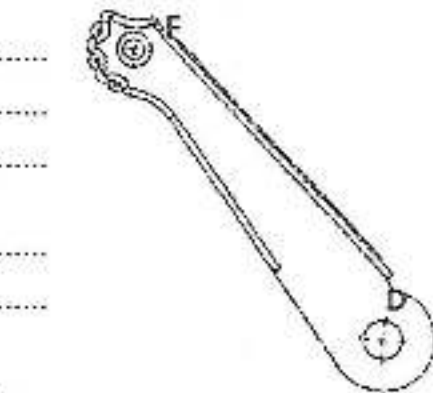
Support of the mechanical actions at F and D:

.....

.....

A-2- Equilibrium of the head 6.A-2-1- Table bill of the external mechanical actions applied to 6.

Forces	P.A.	Support	Direction	Magnitude

A-2-2- Support of $\overline{E_{4/6}}$:

.....

Justification:

.....

.....

A-3- Equilibrium of the arm 3.

F.P.S. :

.....

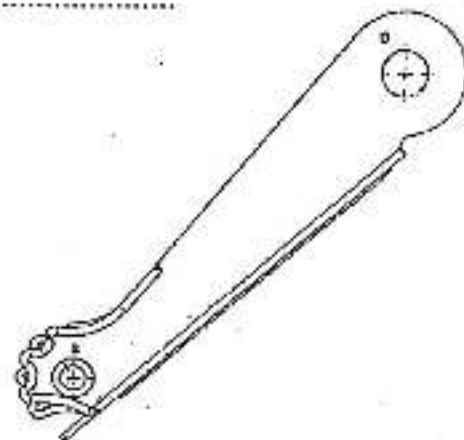
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Support of the mechanical actions at B and D

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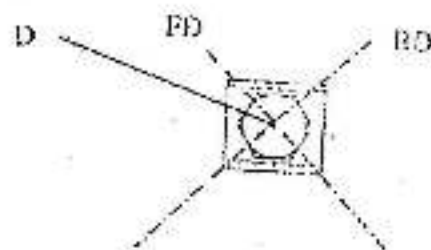
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A-4- Equilibrium of the nut 7.

A-4-1- Table bill of the external mechanical actions applied to 7.

Forces	P.A.	Support	Direction	Magnitude



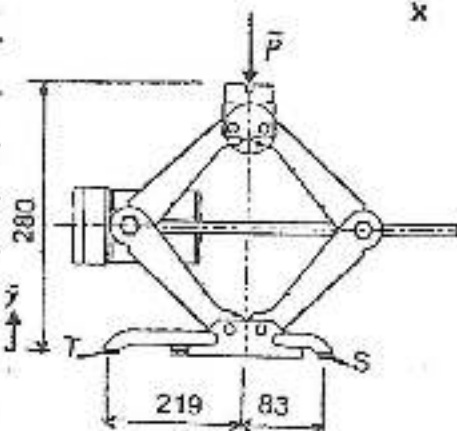
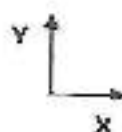
A-4-2-Graphical determination of $\|\vec{D}_{37}\|$ and $\|\vec{D}_{57}\|$

(Scale of forces: 1cm $\leftrightarrow$ 1000N)

$$\|\vec{D}_{37}\| = \dots \dots \dots \|\vec{D}_{57}\| = \dots \dots \dots$$

A-5- Equilibrium of the jack.

Analytical determination of the ground reactions $\|\vec{S}_{01}\|$ and $\|\vec{T}_{01}\|$ on the support 1.



$$\|\vec{S}_{01}\| = \dots \dots \dots \|\vec{T}_{01}\| = \dots \dots \dots$$

III-B KINEMATICS STUDY

B-1- Natures of the movements:

Mvt_{2/1} :Mvt_{6/1} :Mvt_{6/1} :B-2- Trajectory of the point D during the movement of 3 in respect with 1 ($T_{D3/1}$):B-3- Trajectory of the point G during the movement of 6 in respect with 1 ($T_{G6/1}$):B-4- Support of $\overline{V_{D3/1}}$:Support of $\overline{V_{G4/1}}$:

B-5

B-5-1- Calculation of the acceleration a_G of point G: $a_G =$

B-5-2- Determination of the equations of movement of point G.

Expression of the time equation:

..... $y =$

Algebraic expression of the instantaneous linear velocity:

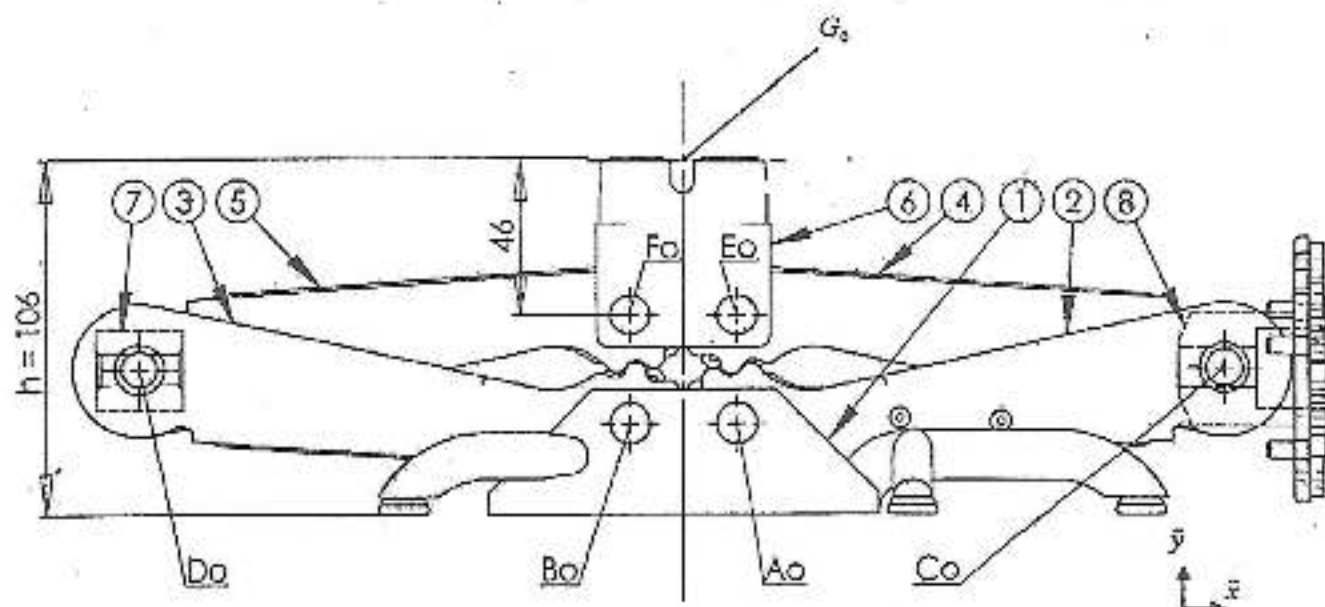
.....

 $V =$

B-5-3- Calculation of the X-coordinate of the point G à the instant $t=0,5s$.

.....

 $y_i =$



ANSWER SHEET

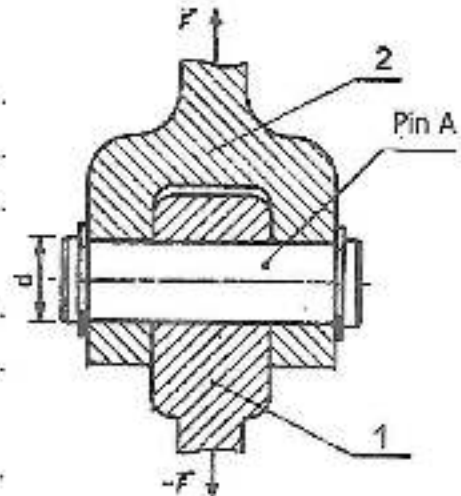
III – C STRENGTH OF MATERIAL

C-1 Nature of the stress to which is subjected the pin A.

C-2 Number of loaded sections.

Indication of the loaded sections.

C-3 Calculation of the minimal diameter which makes it possible to this pin to resist the aforementioned stress.



$$d_{\min} =$$