REGISTRATION CENTRE NUMBER	CENTRE NAME	
CANDIDATE'S FULL NAMES		
CANDIDATE IDENTIFICATION NUMBER	SUBJECT CODE **7175**	PAPER NUMBER **3**
FOR OFFICIAL USE ONLY		

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CAMEROON GENERAL CERTIFICATE OF EDUCATION BOARD
ADVANCED LEVEL EXAMINATION

SUBJECT TITLE	SUBJECT CODE	PAPER NUMBER
HYDRAULIC AND CHASSIS SYSTEMS	**7175**	**3**
	EXAMINATION DATE: **JUNE XXXX**	

Duration 4 Hours

INSTRUCTIONS TO CANDIDATES

This paper is comprised of **THREE** parts which are:

PART I-FAULT TRACING

PART II- REPAIRS AND MEASUREMENT

PART III-ANALYSIS

You are advised to read carefully through the question paper, before you begin your answers.

You are reminded of the necessity for good English and orderly presentation in your answers.

FOR EXAMINERS' USE ONLY	
Marked by……..... Signature of Examiner: ……..Date:……	***SCORE***
Checked by…… Signature:…… Date:……	

HYDRAULICS AND CHASSIS SYSTEMS 3
7175

CAMEROON GENERAL CERTIFICATE OF EDUCATION BOARD
General Certificate of Education Examination

JUNE XXXX **ADVANCED LEVEL**

PART I
FAULT TRACING

Time**: One Hour**

INSTRUCTIONS TO SUPERVISORS ONLY

Candidates shall choose by ballot one fault from the list of **TWO** main engine systems, the fuel supply system

- Examiners shall simulate one fault on each of these systems.
- They should however ensure that the engine is in good working order before the simulation is carried out.
- Candidates should be reassured of the good working order of the engines on which they will perform the fault tracing.
- Examiners should closely watch the candidates during their work so that the method used is noted accordingly.
- Examiners should closely watch the candidates and **INTERVENE IF NEED BE** during the fault tracing. This is to avoid damages that may be caused by the candidate.
- In case of any disorder in their work that might lead to damage or injury, the examiners should immediately stop the candidates.
- All fault tracing forms must be corrected or marked in front of the candidates so that coherence in the method and onward skills can be objectively evaluated.
- Examiners shall ask questions in relation to the each candidate's work without necessarily intimidating or frustrating the candidate.
- The list of proposed faults to be simulated is found below:
  - This part is made up of three main sections (A), (B) and (C), each section is comprised of four topics.
  - By ballot, the candidate is expected to choose a topic either under section A, B, or C.
  - The examiner(s) shall provide the candidate with ALL the necessary working materials.
  - All the candidates are expected to answer the oral written questions at once before proceeding to the practical phase.
  - The written exercise must not EXCEED 15minutes
- Make sure that you hand in the answered questions back to the examiners.

SECTION A: Clutch system (15mins)
- Disconnect any of the hydraulic clutch command line
- Drain the hydraulic fluid to minimum
- Increase the free play pedal

SECTION B: STEERING SYSTEM (15mins)
- Transmission won't engage
- Rough shifts
- Delayed engagement

SECTION C: Suspension System (15mins)
- Loosen center bolt of the leaf spring
- Loosen shackle bolts
- Loosen U bolt.

N.B: The candidate is expected to trace all the faults and put back the circuit in a functional state.
This section MUST ONLY be handled by the examiners

REPUBLIC OF CAMEROON
Peace-Work-Fatherland

MINESEC/GCE BOARD

"ADVANCED LEVEL"
Series: AUTOMOBILE REPAIRS MECHANICS
Session:
Time: 15 minutes

Practical paper

FAULT TRACING

NAME OF CANDIDATE---------------------------------
CODE NUMBER--------------------------
DATE--

✂ -

CODE NUMBER--------------------------
ATC ADVANCED LEVEL
DATE--

WRITTEN QUESTIONS (5marks)

1- What important safety factors would you consider when working under a vehicle on the steering system?

………
………
………
…………………………………………………………………………………

2- Name two steering faults that would cause uneven tire wear?

………
………
………
…………………………………………………………………………………

3- Why is it advisable not to hold the brakes for so long a distance without realizing?

………
………
………
…………………………………………………………………………………

4- What is clutch drag?

………
………
………
…………………………………………………………………………………

5- What part of the suspension reduces the effect of rolling?

………
………
………
…………………………………………………………………………………

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JUNE XXXX **ADVANCED LEVEL**

PART I
FAULT TRACING

Time**: One Hour**

WORK REQUIRED.

The candidates are expected to:

1. Use appropriate tools and correct methodologies to trace the faults simulated, then start and proceed to engine tuning.
2. Carry out a complete engine tune-up using the appropriate equipment supplied by the examiners.
3. Answer the question that shall be posed by the examiners.
4. Fill the fault tracing form.

PART 1: FAULT TRACING				
S/N	**Item**	**Maxi. mark**	**Score**	**Remarks**
1	Out fit	02		
2	Procedure	04		
3	Faults traced	06		
4	Proper use of instruments	06		
5	Corrective action taken	06		
6	Answers to questions	06		
7	Respect of time	04		
8	Filling of form	04		
PART 1 TOTAL		**40**		

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PART II - REPAIRS AND MEASUREMENTS
Time**: Two Hours**

WORK REQUIRED.

A-For repairs
- Dismount
- Dismantle
- Inspect and determine faults
- Repair component
- Remount
- Adjust
- Test
- Establish a report (see table1)
- Answer the questions from the examiners**.**

B-For measurements
- Check;
- Take measurements
- Compare values obtained with the manufacturer's specifications
- Establish a form (see table 2)
- Answer the questions from the examiners.

PART II: REPAIRS AND MEASUREMENTS				
REPAIRS				
1	Dismounting	02		
2	Dismantling	01		
3	Faults identified	02		
4	Choice and mastery of tools	02		
5	Pertinence of checks and adjustments carried out	03		
6	Results obtained	06		
7	Remounting	04		
8	Respect of time given	04		
9	Testing	06		
10	Answers to questions	05		
11	Filling of the repair form	05		
SECTION A TOTAL		**40**		
MEASUREMENTS				
1	Preparation of the work post	02		
2	Use of apparatus	02		
3	Pertinence of the measurement	02		
4	Result obtained	03		
5	Respect of time given	02		
6	Testing	02		
7	Answers to questions	03		
8	Filling of measurement form	04		
SECTION B TOTAL:		**20**		

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JUNE XXXX **ADVANCED LEVEL**

PART II-REPAIRS AND MEASUREMENTS

Time**: Two Hours**

INSTRUCTIONS TO SUPERVISORS

The candidates shall choose by ballot in the presence of the examiners, one of the components on the list ‘‘**A**’’ and “**B**”. Each number chosen by ballot corresponds simultaneously to the number on list the “**A**” for repairs and on the list “**B**” for measurement.
An example: If a candidate chooses figure 1 in the ballot, it automatically corresponds to:

- A. the COMPLETE AXLE for ‘‘Repairs ”
- B. BRAKE SHOES for ‘‘Measurements’’
  - At the end of the first work post, that is repairs, the candidate shall answer **THREE** questions from the examiners, chosen among the set of questions given below.
  - For the second part, that is measurements, the examiners shall ask **THREE** questions of their choice, in relation to the component chosen on the work post.

The marking of tables 1 and 2 shall be done in front of the candidate’s work post in order to verify the exactness of the latter’s work.

Table of list A and B

No	List A	List B
1	Complete Axle	Brake shoes
2	Power Recirculating Ball steering	Universal joints
3	Final drive and Differential	Differential Unit
4	Complete Vehicle.	Synchromesh unit
5	Drum Brakes	Leaf springs

Proposed questions (these must not be kept within the reach of the candidates)

1. Outline the method of work on this component and precise the necessary tools to be used.
2. State two regular faults that likely occur on this component.
3. State the origin of each fault.
4. Explain how you would remedy the faults when noticed.
5. What advice will you give to the user to prevent and or increase the working life span of the component?

FAULT TRACING FORM

NAME OF CIRCUIT OR COMPONENT	CHECKS	INSTRUMENT(S) USED	VALUES		POSSIBLE FAULTS	REMEDIES
			GIVEN	FOUND		

EXAMINER(S) OBSERVATION

EXAMINER'S NAME AND SIGNATURE:

TABLE 1: REPAIRS

Nº phase	Phase	Nº operation	Operation	Duration	Duration of operation	Technical information (and diagram)	Tools	Conclusion

TABLE 2: MEASUREMENTS

NAME OF ORGAN	CHECKS	MEANS USED	VALUES		APPRECIATION		CONCLUSION
			GIVEN	FOUND	GOOD	BAD	

CONCLUSION

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Written Questions Repairs and measurement
Answer all questions in the spaces provided

1. What is the role of a slack adjuster?

……
……
……
……

2. Why is the diaphragm spring not used on heavy duty vehicle?

……
……
……

3. Give the name of the most common steering box used in commercial vehicle.

……
……
……

4. What type of bearing is used on the wheel hubs?

……
……
……

5. In removing a wheel you noticed that the nuts are too hard, what can you do to ease removal of the nuts.

……
……
……

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JUNE XXXX **ADVANCED LEVEL**

PART III-ANALYSIS

State four possible causes and their remedies for when engine power is not fully transmitted ***(6mks)***

Complaint	**Possible causes** ***(1mk×4 =4 mks)***	**Remedies** ***(0.5mk×4 = 2mks)***
hard steering		

After some checks you found out that the clutch plate has worn. Explain the procedures and tools needed to replace the pump. ***(8mks)***

N⁰	**Operation**	**Tool**

In the course of the repairs you, replaces the following parts

- Clutch plate
- Release bearings
- Hydraulic Fluid

Prepared an invoice shown in APPENDIX 1 taking into consideration that the entirely job was completed in 6hrs

EXTRACT OF SPARE PARTS CATALOGUE

N°	**Designation**	**number**	**Unit price**	**Total price**
1	Water pump	1	9000	9000
2	Water pump gasket	1	500	500
3	Alternator belt	1	2000	2000
4	Regulator	1	5000	5000
5	Clutch Plate	1	55000	5000
6	Water pump belt	1	2000	2000
7	Pump	1	45000	45000
8	Release bearing	1	12000	12000
9	Fan relay	1	4000	4000
10	Thermostat	1	7000	7000
11	Hydraulic fluid	1l	3000	3000
12	Transmission fluid	1	15000	15000
13	Master cylinder	1	25000	25000

APPENDIX 1

GARAGE
BP:_____
Tel:_____

ESTIMATE N°_____
Date___ /_____/_____

CUSTOMER	VEHICLE
ADRESS:……..	MARK:……. TYPE……..
……	YEAR OF MANU: ……...
TEL: …….	SERIAL N°:……...
FAX: ……	REGISTRATION:…….

1- LABOUR COST At 4000frs Per Hour **(2mks)**

N°	Designation of phases	Time	Unit price	Total price
1				
2				
3				
4				
5				
	TOTAL			

2- COST OF SPARE PARTS **(2mks)**

references	Designation of spare parts	Quantity	U.P	T.P	Total price
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
	TOTAL				

3- TOTAL COST OF REPAIR ESTIMATE **(4mks)**

AMOUNT WITHOUT TAXES	AMOUNT OF V.A.T	TOTAL
Net to be paid (amount in words): ……...…… ……..		

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JUNE XXXX **ADVANCED LEVEL**

EVALUATION SHEET

Centre No: …….. **Centre Name**: ……..
Candidate's Name: ……
Candidate's Number: …… **Code Nº**: ……..

PART 1: FAULT TRACING				
S/N	**Item**	**Maxi. mark**	**Score**	**Remarks**
1	Out fit	02		
2	Procedure	04		
3	Faults traced	06		
4	Proper use of instruments	06		
5	Corrective action taken	08		
6	Answers to questions	06		
7	Respect of time	04		
8	Filling of form	04		
PART 1 TOTAL		**40**		
PART II: REPAIRS AND MEASUREMENTS				
REPAIRS				
1	Dismounting	02		
2	Dismantling	01		
3	Faults identified	02		
4	Choice and mastery of tools	02		
5	Pertinence of checks and adjustments carried out	03		
6	Results obtained	06		
7	Remounting	04		
8	Respect of time given	04		
9	Testing	06		
10	Answers to questions	05		
11	Filling of the repair form	05		
PART II TOTAL		**40**		
MEASUREMENTS				
1	Preparation of the work post	02		
2	Use of apparatus	02		
3	Pertinence of the measurement	02		
4	Result obtained	03		
5	Respect of time given	02		
6	Testing	02		
7	Answers to questions	03		
8	Filling of measurement form	04		
PART II TOTAL:		**20**		
GRAND TOTAL		**100**		

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PAPER 3 - PRACTICALS

ADVANCED INFORMATION TO CENTRES

PART I: FAULT TRACING

Material estimate per candidate for fault tracing

S/N	DESIGNATION	QTY	U.P	Amount
1	Kerosene	1litre	700	700
2	Lubricant	1/2 litre	1000	1000
3	detergent	1packet	200	200
	Hydraulic Fluid	1litre	3000	3000
GRAND TOTAL				4900

PART II: REPAIRS AND MEASUREMENTS

List of material needed for repairs

1- Complete leaf suspension system
2- Gearbox system
3- Wheel drum assembly for heavy duty struck
4- Coil spring clutch assembly
5- A heavy duty truck
6- Recirculating ball and Worm and wheel steering box