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4136/1**BGCSE**

FOR EXAMINER'S USE ONLY		
✓ Tick the questions answered		
Section A total		
Section B		
16		
17		
18		
19		
20		
21		
TOTAL FOR EXAM		

School Number	Candidate Number
Surname and Initials	

AUTO MECHANICS

PAPER 1 4136/1**Friday****9 MAY 2025****1:00 P.M.–3:10 P.M.****(includes 10 mins. reading time)****Additional materials:****Answer booklet for Section B ONLY****Calculators may be used (NOT GRAPHING)**

MINISTRY OF EDUCATION NATIONAL EXAMINATIONS

BAHAMAS GENERAL CERTIFICATE OF SECONDARY EDUCATION

INSTRUCTIONS TO CANDIDATES

Do not open this booklet until you are told to do so.

Write your school number, candidate number, surname and initials in the spaces provided at the top of this booklet.

Answer **ALL** questions in Section A and **THREE** questions from Section B.

Write your answers to Section A in the spaces provided on this question booklet and your answers to Section B in the answer booklet provided.

It is recommended that you spend approximately **45 minutes** on Section A. This section is worth 40 marks.

You are to spend **1 hour 25 minutes** on Section B. This section is worth 60 marks.

You are advised to use **10 minutes** reading Section B before making your choice of questions.

Use sketches wherever possible to help illustrate your answers.

INFORMATION FOR CANDIDATES

The number of marks available is shown in brackets [] at the end of each question or part question. The total number of marks for this paper is 100.



This question paper consists of 11 printed pages and 1 blank page.

SECTION A

Answer **ALL** questions.

Circle the letter of the correct answer for questions 1 – 3.

1. What type of accident or injury could be caused by exhaust fumes or refrigerants building up in an enclosed space?
 - (a) chemical burns
 - (b) emphysema
 - (c) asphyxiation
 - (d) electric shock[1]

2. To burn, gasoline must be mixed with
 - (a) hydrocarbons
 - (b) nitrogen
 - (c) argon
 - (d) air[1]

3. Which type of extinguisher should be used on a vehicle electrical fire?
 - (a) foam
 - (b) carbon dioxide
 - (c) water
 - (d) wet chemical[1]

Write your answers in the spaces provided.

4. State the piece of equipment used to support a vehicle after it has been lifted to the correct height by a floor jack.

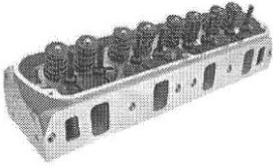
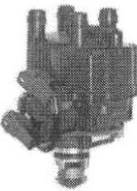
_____ [1]



5. State the proper name of the wrenches shown below.

- (i)  _____ [1]
- (ii)  _____ [1]
- (iii)  _____ [1]
- (iv)  _____ [1]

6. State the name and function of the automotive parts shown below.

- (i)  Name: _____ [1]
Function: _____ [1]
- (ii)  Name: _____ [1]
Function: _____ [1]
- (iii)  Name: _____ [1]
Function: _____ [1]

7. The largest single part of an engine is called the _____ [1]

8. List **THREE** major parts of a vehicle engine's lubrication system.

- (i) _____ [1]
- (ii) _____ [1]
- (iii) _____ [1]



9. State **THREE** reasons for crankshaft wear.

- (i) _____ [1]
- (ii) _____ [1]
- (iii) _____ [1]

10. Use the formula $D = \pi \times R^2 \times L \times N$ to calculate the total displacement of a six-cylinder engine that has a bore diameter of 3 inches and a stroke length of 3.5 inches. Use $\pi = 3.14$ Show all working.

Answer: _____ [3]

11. Give **TWO** ways used to identify the positive and negative terminals of an automotive 12-volt battery.

- (i) _____ [1]
- (ii) _____ [1]

12. In an internal combustion engine, the crankshaft drives the camshaft. State **THREE** methods used to drive/turn the camshaft.

- (i) _____ [1]
- (ii) _____ [1]
- (iii) _____ [1]



13. State one function of an engine's flywheel.

[1]

14. A driver notices that the oil pressure warning light remains illuminated and there is an engine knock during normal engine operation. Should the driver check for worn bearings or too much oil. Give **THREE** reasons for your answer.

What should the driver check? _____ [1]

Reasons:

- (i) _____ [1]
(ii) _____ [1]
(iii) _____ [1]

15. Name **THREE** materials used as

(a) electrical insulators in motor vehicles.

- (i) _____ [1]
(ii) _____ [1]
(iii) _____ [1]

(b) electrical conductors in motor vehicles.

- (i) _____ [1]
(ii) _____ [1]
(iii) _____ [1]

TOTAL MARKS [40]



SECTION B

Answer any **THREE** questions from this section in the answer booklet provided. You are advised to spend **10 minutes** reading these questions before making your choice.

16. (a) Automobiles with manual transmission/gearbox have a clutch between the engine and transmission. State **TWO** ways of operating the clutch mechanism. [2]
- (b) The vehicle's gearbox has already been removed. Explain in detail how you would replace a clutch and pressure plate on the vehicle. Include in your description, what special tools you would use and what safety precautions you would take. [8]
- (c) State **TWO** other clutch assembly components that should be inspected for wear and replaced if necessary. [2]
- (d) Using the letters A – H, name the parts of the clutch system shown below in **Fig. 16.1**. [8]

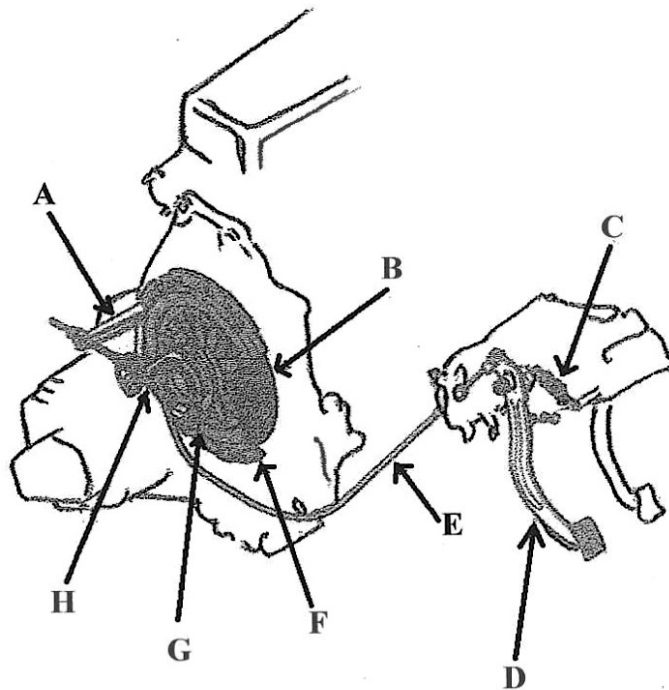
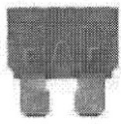
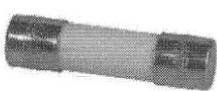


Fig. 16.1

TOTAL MARKS [20]



17. (a) Give **THREE** reasons/causes for each of the following:
- (i) a brake light that remains on after releasing the brake pedal. [3]
 - (ii) headlights are dim. [3]
- (b) (i) Explain how to use an ohmmeter to check for:
- (a) an open circuit. [2]
 - (b) resistance in a length of wire. [2]
- (ii) Using a digital volt/ohmmeter, explain how you would determine if a charging system is working properly under load. [4]
- (c) State the name of the three fuses shown below.
- (i)  [1]
 - (ii)  [1]
 - (iii)  [1]
- (d) Most vehicles built in the last 10 – 15 years have at least one on-board computer. There may be up to six different computers in some vehicles.

State the name of **THREE** systems that are controlled by on-board computers. [3]

TOTAL MARKS [20]

18. The four strokes of a four-stroke internal combustion engine are the intake stroke, compression stroke, power stroke and exhaust stroke.

- (a) Describe the events that occur during each stroke.
- (i) Intake stroke [4]
 - (ii) Compression stroke [4]
 - (iii) Power stroke [2]
 - (iv) Exhaust stroke [3]
- (b) How many revolutions are required to complete the four-stroke cycle for:
- (i) the crankshaft? [1]
 - (ii) the camshaft? [1]
- (c) Using the letters A – E, name the parts of the system shown below in Fig. 18.1 [5]

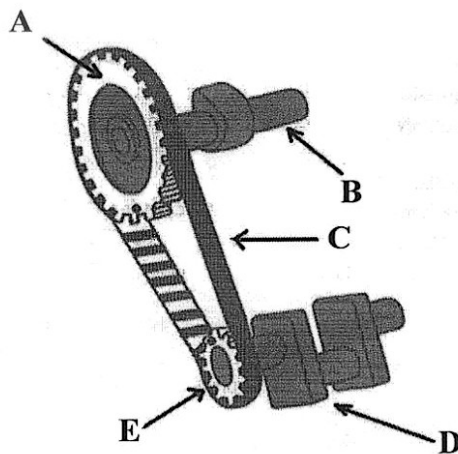


Fig. 18.1

TOTAL MARKS [20]



19. (a) State **THREE** functions that a liquid cooling system of an automobile performs. [3]
- (b) Identify **TWO** places where the level of the coolant could be checked. [2]
- (c) Give the names of **THREE** materials used to construct modern radiators. [3]
- (d) Name **and** describe an alternative to a liquid cooling system that could be used in an automobile. [2]
- (e) What is the boiling point of
- (i) pure water? [1]
- (ii) a 50 – 50 mixture of ethylene glycol and water? [1]
- (f) **Fig. 19.1** shows the component of a down flow radiator. Name the parts, using the letters A – H. [8]

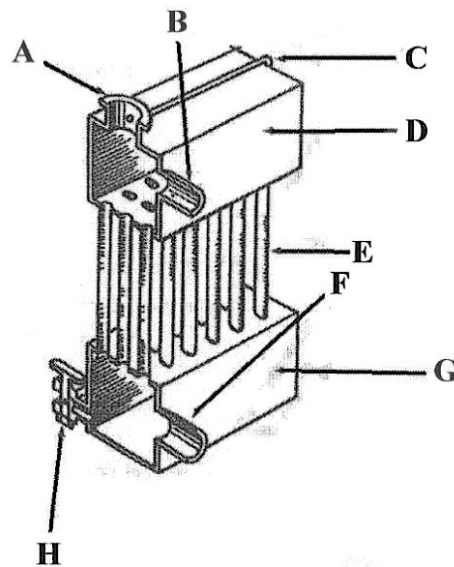


Fig. 19.1

TOTAL MARKS [20]

20. (a) What is meant by Roadcraft? [2]
- (b) State the meaning of the warning signs shown below.
- (i)  [1]
- (ii)  [1]
- (iii)  [1]
- (iv)  [1]
- (v)  [1]
- (c) What is driver reaction time? [1]
- (d) What is the overall safe stopping distance equation according to Roadcraft? [2]
- (e) Describe what AWD means when referring to an automobile. [2]
- (f) State **FOUR** safety checks you would carry out on a motor vehicle before going a road trip. [4]
- (g) What do the letters P, R, N and D stand for on an automatic shift gate? [4]



TOTAL MARKS [20]

21. (a) What is the purpose of a vehicle's engine air induction system? [2]
- (b) Which component in the throttle body restricts and allows air to flow through the air intake? [1]
- (c) (i) The following abbreviations are used for components in the air induction system. State the full name of these components. [3]
- IAC
 - MAP
 - TPS
- (ii) State the **FOUR** main components of the air induction system. Do **NOT** include the components listed in (c)(i). [4]
- (d) Which device measures airflow directly? [1]
- (e) What part connects the throttle body to the intake ports in the cylinder head? [1]
- (f) Name **TWO** devices that can be used to increase the air pressure supplied to a vehicle's engine. [2]
- (g) The component that cleans the induction air needs to be changed periodically. List the steps to follow when changing this component. [6]

TOTAL MARKS [20]



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