

MVM – Materials and  
Automotive Technology

**T086**

Tuesday, 27/11/2018

08:30 – 11:30 AM

WORKFORCE DEVELOPMENT AUTHORITY



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**ADVANCED LEVEL NATIONAL EXAMINATIONS, 2018,  
TECHNICAL AND PROFESSIONAL STUDIES**

**EXAM TITLE:**

**MATERIALS AND AUTOMOTIVE TECHNOLOGY**

**OPTION: Motor Vehicle Mechanics (MVM)**

**DURATION: 3 hours**

**INSTRUCTIONS:**

The paper is composed of **three (3) main Sections** as follows:

**Section I: Sixteen (16) compulsory questions. 55 marks**

**Section II: Attempt any three (3) out of five questions. 30 marks**

**Section III: Attempt any one (1) out of three questions. 15 marks**

**Note:**

***Every candidate is required to carefully comply with the above instructions. Penalty measures will be applied on their strict consideration.***

**Section I. Sixteen (16) Compulsory questions.**

**55 marks**

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01. What does firing order mean? **(1 mark)**
02. Calculate the number of power cycles per minute with an engine speed of 3000rpm for a 3 cylinder engine and for a 6 cylinder engine. **(3 marks)**
03. Describe the term ignition interval and calculate it for a 3cylinder engine. **(2 marks)**
04. Explain the process knocking combustion. **(2 marks)**
05. What factors do cause knocking? **(6 marks)**
06. Diesel vehicles are hugely popular. Give reasons for this development. **(5 marks)**
07. Name three measures to observe while working on a cooling system. **(4 marks)**
08. Where must the drained coolant be disposed? **(2 marks)**
09. Which final work is required after changing the coolant? **(4 marks)**
10. Explain 5PK1750belt designation of newly prescribed ribbed V-belt. **(3 marks)**
11. Name the most important tasks of oiling. **(6 marks)**
12. The oil in the bottle is used to fill the engine, explain the designation SAE 15W 40. **(3 marks)**
13. Describe the advantages of multi-grade oil in comparison to single-grade oil. **(4 marks)**
14. You use a torque wrench to tighten the wheel bolt (130Nm tightening torque). How large must the hand force be over an effective lever arm length of 600 mm? **(3 marks)**
15. Why do manufactures require special adhesives and rivets? **(2 marks)**
16. What happens if there is too much hardener in the mix? **(5 marks)**

**Section II. Choose and Answer any three (3) questions**

**30 marks**

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17. Discuss about the four stroke engine lubrication components and their function. **(10 marks)**
18. Explain the process of checking bearing clearance by using Plastigage. **(10 marks)**
19. What are the possible causes and remedies of the hard starting on diesel engine? **(10 marks)**
20. State three advantages and two disadvantages of liquid cooling. **(10 marks)**
21. Discuss the five possible causes and remedies of engine overheating. **(10 marks)**

**Section III. Choose and Answer any one (1) question**

**15 marks**

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22. State ten ways used to classify the automotive engines. **(15 marks)**
23. Explain all procedures of checking the compression pressure on a four cylinder petrol engine. **(15 marks)**
24. Discuss seven Emission control systems used to reduce amount of air pollution produced by the automobile. **(15 marks)**