

DIPLOMA IN AUTOMOTIVE/HEAVY EQUIPMENT ENGINEERING

LEVEL 6 YEAR I EXAMINATIONS

FINAL INTEGRATED SUMMATIVE EXAMINATIONS

SITTING: NOVEMBER/DECEMBER 2025

SUBJECT: WORKSHOP PROCESSES

TIME: THREE (3) HOURS **TOTAL MARKS: 100**

PASS MARK: 50

INSTRUCTIONS TO CANDIDATE

1. Write your Examination number and National Registration Card (NRC) number on the answer booklet provided. Ensure you append your signature in the space provided on the answer booklet.
2. Write the ANSWER SCRIPT SERIAL NUMBER on the examination register and on the entry slip provided.
3. Answer five (5) questions. Question 1 is compulsory and choose any other four (4) questions.
4. All questions carry equal marks.
5. Cell phones and programmable calculators are not allowed in the examination room.

DO NOT TURN THIS PAGE UNTIL YOU ARE TOLD TO DO SO

QUESTION 1 - COMPULSORY

A. You have been asked to lead a short safety briefing for new employees in a mechanical workshop. Your topic is "First Aid Awareness." To start the briefing, define "First Aid". [2 marks]

B. During your talk, you hold up the workshop's first aid kit. List eight (8) essential items that should be found in a basic first aid kit. [8 marks]

C. A new apprentice asks, "Why is it so important for all of us to know about first aid?" Explain the importance of first aid knowledge in a workplace like this. [10 marks]

Total [20 marks]

QUESTION 2

You are the new Health and Safety Representative for your workshop. Your first task is to create a simple safety guide for all new apprentices.

A. What does the common workplace safety acronym "PPE" stand for? [1 mark]

B. In your guide, you need to explain different types of dangers. Provide a clear definition of a "health hazard." [2 marks]

C. To make the guide practical, list five (5) specific examples of health hazards that could be present in a workshop environment. [5 marks]

D. The most important part of your guide will explain how to protect oneself. For each of the following body parts, explain the specific type of PPE used for protection in the workshop.

i) Head [2 marks]

ii) Foot [2 marks]

iii) Hands [2 marks]

iv) Eyes [2 marks]

v) Ears [2 marks]

vi) Body [2 marks]

Total [20 marks]

QUESTION 3

Explain on the following basic principles of rigging.

A. Safe working load. [5 marks]

B. Sling certification. [5 marks]

C. Load balancing. [5 marks]

D. Rigging certification. [5 marks]

Total [20 marks]

QUESTION 4

You have been promoted to Workshop Supervisor. Your first major task is to redesign the current workshop layout to improve both safety and efficiency for the mechanics. Explain the importance of each of the following factors in creating a functional and productive workspace:

A. Ventilation. [4 marks]

B. Temperature. [4 marks]

C. Room dimension and space. [4 marks]

D. Lighting. [4 marks]

E. Proximity of tools and equipment. [4 marks]

Total [20 marks]

QUESTION 5

You are a senior technician, and a new apprentice will be performing their first maintenance task on a large, stationary machine. You must ensure they understand the critical safety procedure of Isolate and Tag Out.

A. Provide the apprentice with a clear and concise definition of what "Isolate and Tag Out" means. [2 marks]

B. Before starting the procedure, you must identify all potential dangers. List seven (7) different types of hazardous energy sources that must be controlled during the Isolate and Tag Out process. [7 marks]

C. Now, guide the apprentice through the process. Describe the step-by-step procedure for safely carrying out an Isolate and Tag Out. [11 marks]

Total [20 marks]

QUESTION 6

You are the designated first aider in your workshop. A serious incident has just occurred, and you are the first to respond.

A. To quickly assess the situation, state four (4) common types of accidents that can occur in a workshop environment. [4 marks]

B. You notice one of the casualties appears pale, cold, and confused. List four (4) signs and symptoms that would indicate a person is going into shock. [4 marks]

C. While waiting for professional medical help to arrive, explain the critical first aid steps you would take for the following specific injuries:

i) A suspected head/brain injury. [4 marks]

ii) A broken or fractured arm. [4 marks]

iii) A burn injury from a welding spark or electrical fault. [4 marks]

Total [20 marks]

QUESTION 7

You are training a new apprentice on the safe and correct use of the pillar drill in the workshop.

A. When discussing different drilling tasks, the apprentice asks about hole types. Clearly explain the difference between a blind hole and a through hole [2 marks]

B. You observe the apprentice about to drill without marking the material first. Explain why it is essential to use a centre punch before starting any drilling operation. [2 marks]

C. Before allowing the apprentice to use the machine independently, you must test their knowledge of safety. State three (3) critical safety precautions that must always be followed when operating a drilling machine. [6 marks]

D. To ensure they are familiar with the equipment, you point to various parts of the drilling machine. Identify the parts labelled 1 to 10 on the provided figure Q7. [10 marks]

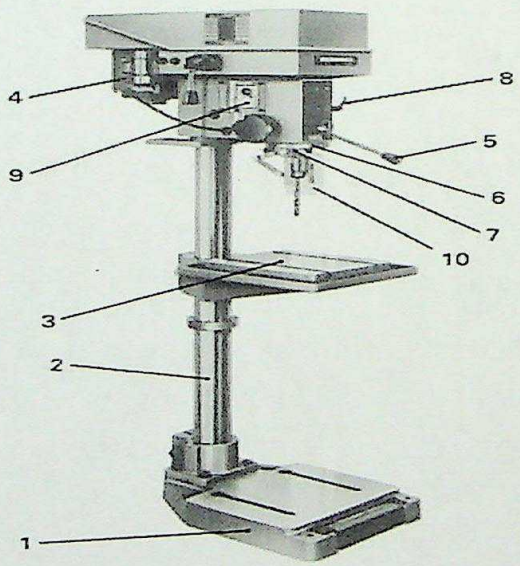


Figure Q7

Total [20 marks]

QUESTION 8

You are a senior technician responsible for mentoring a new apprentice in fundamental workshop practices involving fasteners and gas welding.

A. While demonstrating how to install a cylinder head, you explain the importance of a specific tightening pattern. Name three (3) common torquing sequences used to ensure even clamping force and prevent distortion. [3 marks]

B. The apprentice is familiar with nuts and bolts. To broaden their understanding, list three (3) examples of non-mechanical fasteners used in assembly work. [3 marks]

C. The apprentice is confused about how the fasteners from part (B) differ from the bolts they usually use. Clearly explain the fundamental distinction between mechanical fasteners and non-mechanical fasteners. [4 marks]

D. Before allowing the apprentice to assist with a gas welding operation, you review the critical safety rules. List five (5) essential safety precautions that must be observed when carrying out gas welding. [10 marks]

Total [20 marks]