

**THE UNITED REPUBLIC OF TANZANIA
NATIONAL EXAMINATION COUNCIL OF TANZANIA
DIPLOMA IN TECHNICAL EDUCATION EXAMINATION**

789

METAL WORKING AND MECHANICAL PRACTICE

Time: 3 Hour.

Monday, 13th May 2013 a.m.

Instructions

1. This paper consists of **eight (8)** questions.
2. Answer any **five (5)** questions.
3. Each question carries **twenty (20)** marks.
4. Non-programmable calculators may be used.
5. Communication devices, programmable calculators and any unauthorized materials are **not** allowed in the examination room.
6. Write your **Examination Number** on every page of your answer booklet(s).

maktaba.tetea.org



1. (a) Define the term “lathe chuck” and explain its function.
 - (b) (i) State two types of lathe chucks.
 - (ii) Describe one advantage of each type mentioned.
 - (c) Explain how to safely mount a workpiece using a three-jaw chuck.
 - (d) List four precautions to observe when working with a lathe chuck.
2. (a) What is “keyway” in mechanical engineering?
 - (b) (i) State three methods used for cutting keyways.
 - (ii) Give one advantage of each method stated.
 - (c) Explain the purpose of keyways in power transmission.
 - (d) State four causes of failure in keyway joints.
3. (a) What is meant by “machine vice”?
 - (b) (i) List three uses of a machine vice in mechanical workshops.
 - (ii) Explain the difference between machine vice and bench vice.
 - (c) Describe how to mount and align a machine vice on a drilling machine.
 - (d) List four maintenance practices for a machine vice.
4. (a) Define “arc blow” in arc welding.
 - (b) (i) State two types of arc blow.
 - (ii) Describe two methods of preventing arc blow during welding.
 - (c) Explain how arc blow affects the quality of the weld.
 - (d) List four welding positions and where each is commonly used.
5. (a) What is meant by “bore gauge”?
 - (b) (i) State the difference between a telescopic gauge and a dial bore gauge.
 - (ii) Give one advantage of each gauge mentioned.
 - (c) Describe the procedure for measuring an internal bore using a bore gauge.
 - (d) State four possible causes of inaccurate bore measurements.

6. (a) Define the term “reamer runout” and explain how it occurs.
- (b) (i) State three causes of runout during reaming.
- (ii) Give two effects of excessive runout on hole quality.
- (c) Describe how to reduce reamer runout during machining.
- (d) State four properties of a good quality reamer.
7. (a) What is “die threading”?
- (b) (i) List two types of dies used for external threading.
- (ii) Explain how each is held and used during the process.
- (c) Describe how to check the accuracy of an external thread after cutting.
- (d) State four causes of thread failure after die cutting.
8. (a) Define “back gear” in a centre lathe.
- (b) (i) State the function of back gear in turning operations.
- (ii) Describe two conditions when back gear should be used.
- (c) Explain how to engage the back gear system in a lathe.
- (d) State four possible problems that may arise from improper use of back gear.