



08:30 – 11:30 AM

Names

Index number

TVET NATIONAL EXAMINATION, RTOF LEVEL 5, 2020-2021

QUESTIONS and ANSWERS BOOKLET

OPTION/TRADE: **MECHANICAL PRODUCTION TECHNOLOGY**

SUBJECT: Machine Elements Description

ACADEMIC YEAR: 2020-2021

Read carefully the instructions on page (i) & (ii)

FOR EXAMINER'S USE ONLY

[illegible]



TVET NATIONAL EXAMINATION, RTQF LEVEL 5, 2020-2021

INSTRUCTIONS TO CANDIDATES: PART I (Answer Booklet)

1. A candidate should fill in the actual names and the index number on the cover of this questions and answer booklet on the provided place (Black Box).
2. It is illegal for a candidate to write any of his/her names, index number or a school name inside the answer booklet.
3. A candidate should check if all pages of the answer booklet are complete. No candidate should remove or tear any pages or part of it from the answer booklet.
4. A candidate should answer in the language in which the examination is set. (See page **(ii)**)
5. A candidate should sign on the sitting plan when submitting the answer booklet. He/she has also to check if the answer booklet is well sealed.
6. No extra paper is allowed in the examinations room. If a candidate is caught with it his/her results will be nullified.
7. No candidate is allowed to write answers not related to the subject being sat for, otherwise it will be considered as a cheating case.
8. Write your answers on the 12 lined pages (From page 1 of 12 to page 12 of 12).
9. Use the last non-lined pages as draft.
10. Results for any candidate who is caught in examination malpractices are nullified. The cheating can be recognized during examinations administration, marking exercise or even thereafter.

TVET NATIONAL EXAMINATION, RTQF LEVEL 5, 2020-2021

OPTION/TRADE: MECHANICAL PRODUCTION TECHNOLOGY

SUBJECT: Machine Elements Description

DURATION: 3 hours

INSTRUCTIONS TO CANDIDATES: PART II(Question Paper)

The paper is composed of two (2) Sections as follows:

Section I: Attempt all the Twelve (12) questions (60 marks)

Section II: Attempt any Four (4) questions out of Six (6) (40 marks)

Allowed materials:

- Ruler or square
- Calculator

Note:

Every candidate is required to carefully comply with the provided assessment instructions.

01. a) Define the following terms:

- i)** Dead load
- ii)** Live load
- iii)** Shock load
- iv)** Impact load

b) List any two (2) types of joints

(5 marks)

02. A gear drive comprising two gears A and B have a ratio of 1.5.

Gear A has 28 teeth, revolves at 126 rpm and is smaller than B.

If both gears have a module of 2.5 mm, determine:

- a)** The speed of gear B
- b)** The distance between the centers of the gears

(5 marks)

03. List any four (4) functions of gear drive.

(5 marks)

04. a) List and explain three (3) types of links.

- b)** In a hand drill, the motor of 3600 rpm is transmitted to the drill spindle via 2 gears with 8 teeth and 32 teeth. Calculate the rpm of the drill spindle.

(5 marks)

05. Enumerate any five (5) causes of gear tooth failure.

(5 marks)

06. Identify any five (5) objectives of accurate alignment

(5 marks)

- 07.** Highlight any five (5) symptoms of misalignment. **(5 marks)**
- 08.** Write down four (4) different types of motion in mechanical systems. **(5 marks)**
- 09.** List four (4) types of supporting machine elements. **(5 marks)**
- 10.** Describe the various types of shaft couplings. **(5 marks)**
- 11.** With help of sketch, explain the types of stresses induced in metals. **(5 marks)**
- 12.** List Advantages and Disadvantages of Chain Drive over Belt or Rope Drive. **(5 marks)**

Section II: Attempt any Four (4) questions out of Six (6) (40 marks)

13. Explain the different causes of gear tooth failures and suggest possible remedies to avoid such failures. **(10 marks)**
14. Write down any ten (10) provided information in corrective maintenance **(10 marks)**
15. What are the essential points to be taken into consideration while starting-up an inspection of machine elements? **(10 marks)**
16. a) Differentiate a motor from an engine
b) Identify the essential points to be taken into consideration while designing a gear drive. **(10 marks)**
17. a) What do you understand by “Corrective Maintenance” in machine elements?
b) After corrective maintenance for element of machine (for example Gear Drive), make “a repair report” of gear drive. **(10 marks)**

18. A cast iron link, as shown in Figure below, is required to transmit a steady tensile load of 45 kN.

Find the tensile stress induced in the link material at sections A-A and B-B. All dimensions are in mm.

(10 marks)



