

GME – Mechanical Technology

T078

Monday, 26/11/2018

08:30 – 11:30 AM

WORKFORCE DEVELOPMENT AUTHORITY



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

EXAM TITLE: MECHANICAL TECHNOLOGY

OPTION: General Mechanics (GME)

DURATION: 3 hours

INSTRUCTIONS:

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

Section I: Thirteen (13) 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

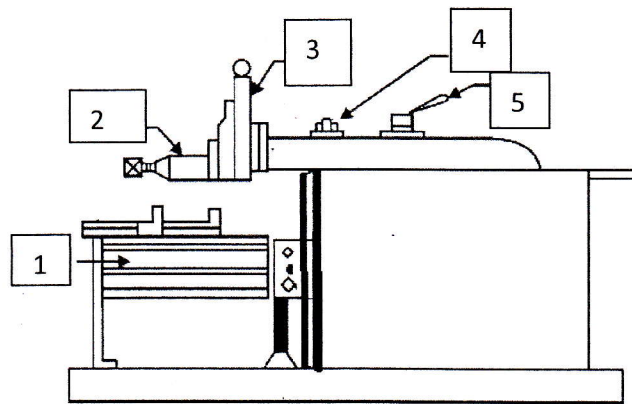
Note:

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

Section I. Thirteen (13) Compulsory questions

55 marks

- 01.** List four types of chips which may be produced during metal cutting. **(4 marks)**
- 02.** Explain what is meant by the term “Machinability”. **(4 marks)**
- 03.** List the factors that contribute to a tool wear. **(4 marks)**
- 04.** List the major functions of cutting fluids in machining. **(5 marks)**
- 05.** Define the term “Depth of cut”. **(4 marks)**
- 06.** The figure below shows 5 parts of shaper numbered from 1 to 5, give the names of indicated parts. **(5 marks)**

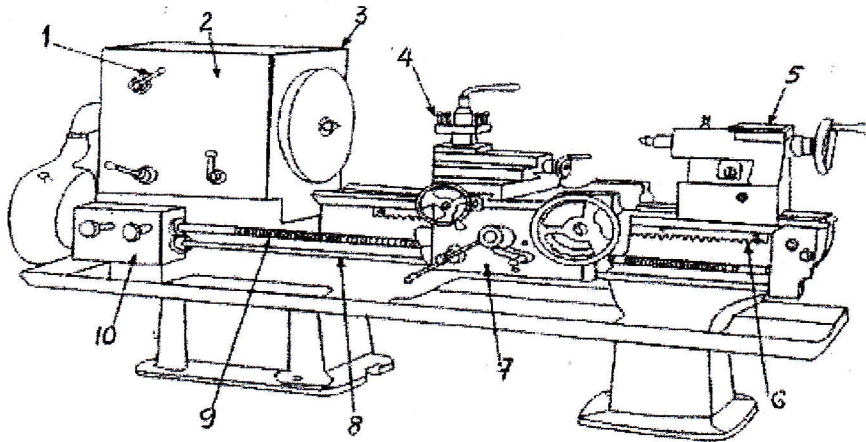


- 07.** A lathe is provided with a gear train in steps of 5 teeth and an additional gear of 127 teeth. Calculate the gears for cutting metric threads of 5.25 mm pitch if the lead screw of the lathe contains 6TPI. **(5 marks)**
- 08.** What is a slotter? List the three main Driving mechanism used in slotter. **(5 marks)**
- 09.** Describe a method of producing curved surfaces on a planer. **(4 marks)**
- 10.** Indicate the rules to be followed while holding cutters on a milling Machine. **(4 marks)**
- 11.** Describe briefly the main functions of a universal milling Machine. **(4 marks)**
- 12.** How are grinding wheels specified? **(4 marks)**
- 13.** Name any three operations that can be performed on a grinding Machine. **(3 marks)**

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

30 marks

14. Name the parts of the center lathe as they are labeled in the figure.



(10 marks)

15. a. What do you understand by “indexing” in machine tools?

b. Identify the operations where indexing is adopted.

c. Give four methods “indexing” can be achieved.

d. Give another name of indexing head.

(10 marks)

16. a. Give the types of heat – treatment processes of steels and the objectives of each of them.

b. What are the two major groups of metals? What is the difference between them?

(10 marks)

17. a. Detail the factors influencing a proper cutting speed in machining operations.

b. What is a blind hole?

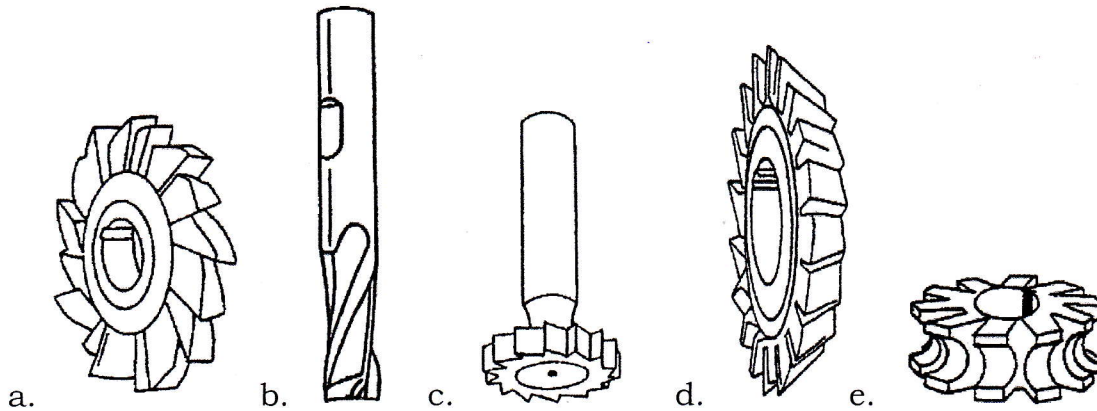
(10 marks)

18. What are the specifications of a horizontal milling machine? **(10 marks)**

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

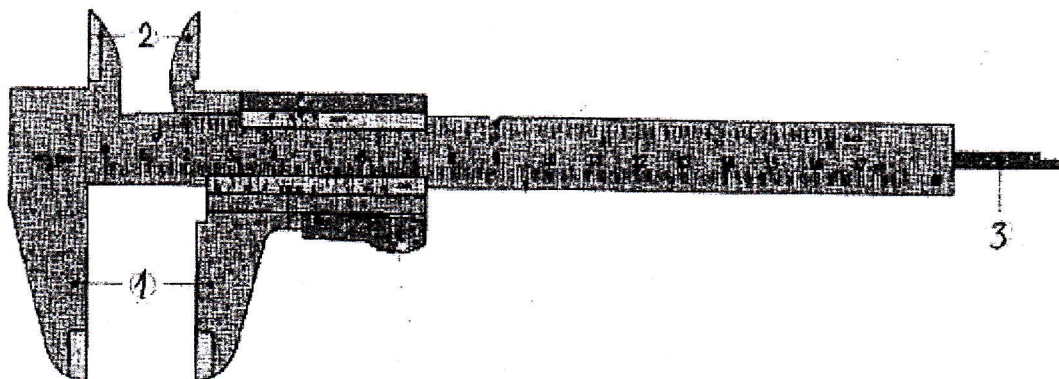
15 marks

- 19.** Name the following cutters and give the operations performed by each one. **(15 marks)**



- 20.** Describe and give the role of main parts of a horizontal milling machine. **(15 marks)**

- 21. a.** How does a boring operation differ from a turning operation?
b. Calculate the time required to machine a workpiece 200 mm long, 60 mm diameter to 198 mm long, 48 mm diameter. The workpiece rotates at 400 rpm, feed is 0.3mm/rev and maximum depth of cut is 2 mm. Assume total approach and overtravel distance as 6 mm for turning operation.
c. Name the labeled parts 1, 2 and 3 of a Vernier Caliper and develop the role of each



(15 marks)