

GME – Mechanical Technology

T083

Thursday, 12/11/2015

08:30 – 11:30

WORKFORCE DEVELOPMENT AUTHORITY



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**ADVANCED LEVEL NATIONAL EXAMINATIONS, 2015,
TECHNICAL AND PROFESSIONAL TRADES**

EXAM TITLE: Mechanical Technology

OPTION: General Mechanics (GME)

DURATION: 3hours

INSTRUCTIONS:

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

Section I: Fourteen (**14**) questions, all **Compulsory**. **55marks**

Section II: Five (**5**) questions, **Choose Three (3) only**. **30marks**

Section III: Three (**3**) questions, **Choose only one (1)**. **15marks**

Every candidate is required to strictly obey the above instructions. Punishment measures will be applied to anyone who ignores these instructions.

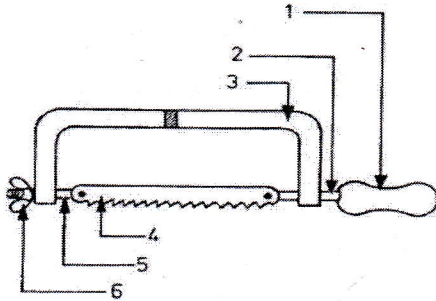
Section I. Fourteen (14) Compulsory questions. 55marks

01. State two commonly used methods of filing and when they are applied.

4marks

02. Name the parts of the hacksaw as labeled in the figure.

6marks



03. Why is saw setting essential for a hacksaw blade?

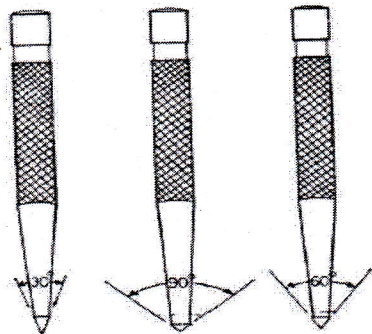
1mark

04. Give the types of setting of blade teeth.

3marks

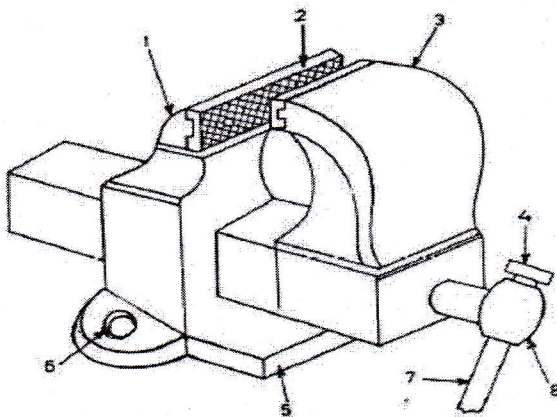
05. Name the punches shown below and give clearly the applications of each.

6marks



06. Name the different parts of fitter parallel vice as labeled.

4marks



07. A 400g hammer is moving at a speed of 3m/s. It strikes a bush and pushes it by a distance of 5mm. Calculate the force of the hammer blow on the bush.

2marks

08. Define a "scraper" and give different types of scrapers commonly used.

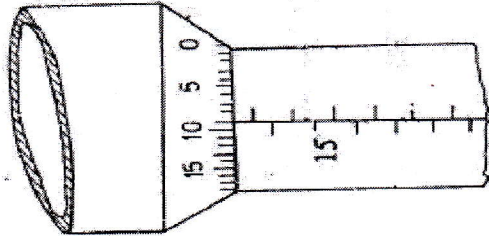
5marks

09. What shall be the r.p.m and time required of a 35 mm diameter drill when drilling on mild steel plate 25 mm thick, the recommended cutting speed is 25 m/min at feed of 0.36 mm/min.

3marks

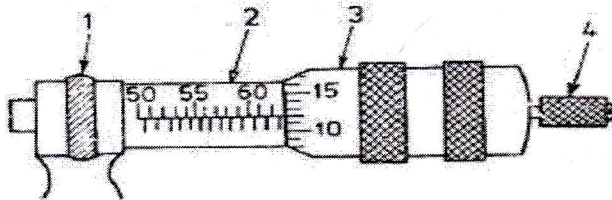
10. Read the dimensions on Vernier micrometer.

1mark



11. Read the dimension and name the parts as labeled.

5marks



12. Define the mechanical properties of metals:

- A. Brittleness
- B. Ductility
- C. Malleability
- D. Hardness
- E. Toughness.

5marks

13. Give the basic composition of:

- a. Brass
- b. Bronze

4marks

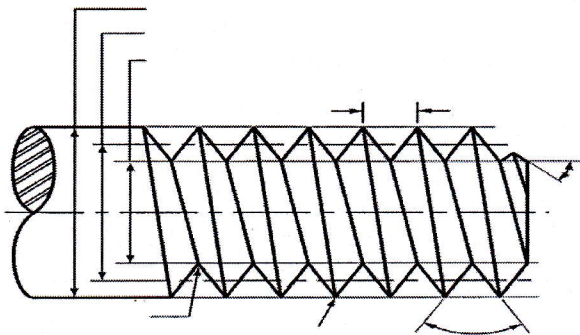
14. List out the common heat – treatment operations.

6marks

Section II. Answer any three (3) questions of your choice

(Do not choose more than three questions). 30marks

15. By drawing, show the terminology of an external screw threads illustrated by arrows bellow:



10marks

16. a) Briefly describe any eight principal parts of the lathe.
b) What does the tapered hole do in milling operation?

10marks

17. A mild steel bar of 16mm diameter was tested for tensile strength with the gauge length of 60mm, the load applied was 96KN, the yield load was 54KN, the final diameter and length recorded were 8.85mm and 72mm respectively.

Calculate:

- a) Yield stress
- b) Ultimate tensile stress
- c) Tensile strain
- d) Young's Modulus
- e) Percentage reduction in area and Percentage elongation.

10marks

18. Describe the principal parts of a Milling Machine and their functions.

10marks

19. Define the Guest's or Tresca's Theory.

10marks

Section III. Answer any one (1) question of your choice (Do not choose more than one question).

15marks

20. Fill in the table of troubles, causes and remedies while drilling operations.

15marks

Symptoms	Probable causes	Remedies
1. Rough hole	- -	- -
2. Split - up centre	- -	- -
3. Hole larger than drill	- -	- -
4. Breaking of drill in deep hole	- -	- -
5. Chipping of the lip of cutting edges	- -	- -

21. List out the commonly used vices and the applications of each.

15marks

22. After naming the main parts of a horizontal milling machine below, describe briefly the role of each part as labeled.

15marks

