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THE UNITED REPUBLIC OF TANZANIA
NATIONAL EXAMINATIONS COUNCIL
CERTIFICATE OF SECONDARY EDUCATION EXAMINATION

095 **FITTING AND TURNING**

(For Both School and Private Candidates)

Time: 3 Hours **Monday, 16th November 2015 a.m.**

Instructions

1. This paper consists of sections A, B and C.
2. Answer **all** questions in sections A and B, and **three** (3) questions from section C.
3. Calculators and cellular phones are **not** allowed in the examination room.
4. Write your **Examination Number** on every page of your answer booklet(s).

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SECTION A (10 Marks)

Answer **all** questions in this section.

1. From each of the items (i) – (x), choose the correct answer among the given alternatives and write its letter beside the item number in the answer booklet provided.

(i) The algebraic different between the minimum limit and the basic size is called
A actual deviation B upper deviation C lower deviation
D fundamental deviation E basic deviation.

(ii) The cold chisels are made by
A drawing B rolling C piercing D forging E turning.

(iii) A two high rolling mill consists of two rolls which rotate at
A the same speed but in opposite direction
B different speeds and in the same direction
C the same speed and in the same direction
D different speeds and in the opposite direction.
E the same speed but one is following behind.

(iv) In the sheet metal work, the cutting force on the tool can be reduced by
A increasing the hardness of the tool
B grinding the cutting edges sharp
C increasing the speed of cutting
D decreasing the hardness of the tool
E increasing the hardness of the die.

(v) When drilling on a lathe machine, the drill is forced into the work by
A engaging the cross feed B turning the compound rest handle
C turning the tailstock hand wheel D engaging the longitudinal feed
E using carriage hand wheels.

(vi) The combination of several cutters in the milling operation is called
A double angle milling cutters B multiple milling cutters
C straddle milling cutter D gang milling cutters
E many milling cutter.

(vii) During marking exercise, dividers are used for
A scribing centres and lines B scribing circles and arcs
C scribing centres and circles D scribing centres and arcs
E scribing circles and lines.

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(viii) Which of the following are examples of permanent metal joining?

A Bolts and Brazing. B Brazing and Riveting.
C Reveting and Screwing. D Gas Welding and Bolts.
E Gas welding and Brazing.

(ix) The instrument which has all the features of try-square, bevel protractor, rule and scriber is known as

A Outside micrometer B Inside micrometer C Depth gauge micrometer
D Vernier caliper E Combination set.

(x) The name of a file is derived from its

A cross sectional area B longitudinal length C width surface area
D traverse width E length of shank.

SECTION B (30 Marks)

Answer **all** questions in this section.

2. Name the three most useful materials to make lathe cutting tools.
3. List three parts of the shaper used in setting the position of stroke.
4. Sketch the diagrams of the following operations performed in a drilling machine:
   (a) Spot facing (b) Counter sinking.
5. (a) What factors determines the performance of power hacksaw blade?
   (b) What is the purpose of clapper box of shaping machine?
6. Name the three categories of safety.
7. (a) Briefly state the use of hammers in fitting and turning workshops.
   (b) Find the tolerance of the dimension $10.00^{+0.035}_{-0.025}$.
8. Mention three ways on how rivets are classified.
9. Give three advantages of a radial drilling machine over the other type of drilling machine.
10. Differentiate Accuracy from Precision.
11. Give two reasons for providing folded edge on items made from sheet metal.

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SECTION C (60 Marks)

Answer **three (3)** questions from this section.

12. (a) State five grades of file and for each grade state its application. **(10 marks)**
    (b) State five precautions that must be taken to keep a file in good cutting condition and properly. **(10 marks)**

13. (a) Name the parts labeled a, b, c, d and e of the apparatus in Figure 1. **(05 marks)**
    (b) Briefly explain the functions of the parts of apparatus in Figure 1. **(12.5 marks)**
    (c) Describe the steady rest as used with lathe machine. **(02.5 marks)**

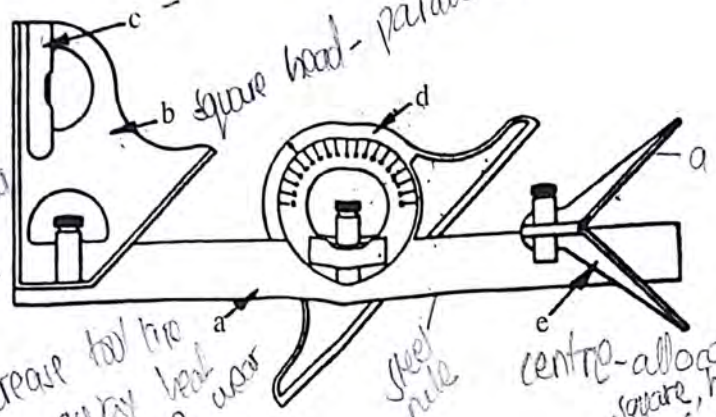

Figure 1

14. (a) Explain five functions of coolant used in machining processes. **(10 marks)**
    (b) Briefly describe the importance of soap and straight oils in cutting fluids. **(04 marks)**
    (c) Briefly describe the two accessories of a lathe machine in Figure 2 (i) and (ii). **(06 marks)**

(i)

(ii)

Figure 2

15. (a) Enumerate four methods used to hold the work piece in a milling machine. **(06 marks)**

    (b) Describe hand lapping and machine lapping **(05 marks)**

    (c) Calculate the number of complete revolutions and parts of a revolution that the inde crank must be turned for a work piece to be divided into 15 parts, given that the inde plate has the following number of holes, 27, 33 and 39. **(09 marks)**

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16. (a) (i) Sketch a fully labeled ball-pein hammer.
(ii) Identify the material used for making a ball-pein hammer and briefly describe how ball-pein hammer is made.
(iii) Briefly explain two safety precautions to be observed when using ball-pein hammer.
(12 marks)

(b) Briefly describe the following with regard to grinding wheel:
(i) Grit (ii) Grade (iii) Structure (iv) Bond.
(08 marks)

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