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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 **Tuesday, 15th November 2016 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).
5. Use, $\pi = \frac{22}{7}$

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SECTION A (10 Marks)

Answer **all** questions in this section.

1. For 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 accuracy of micrometers, calipers and dial indicators can be checked by
A a Feller gauge B a Slip gauge C a Ring gauge
D a Plug gauge E a Snap gauge.

(ii) In a bilateral system of tolerance, the tolerance is allowed on
A one side of the actual size B one side of the nominal size
C both sides of the actual size D both sides of the nominal size
E not of either sides of actual or nominal size.

(iii) Which of the following chisel is used for cutting key ways?
A Round nose chisel. B Half round nose chisel. C Diamond pointed chisel.
D Flat chisel. E Cape chisel.

(iv) What are the uses of fullers tool in fitting and turning workshops?
A Finishing flat surfaces. B Punching a hole.
C Finishing punched holes. D Necking down a piece of work.
E Making round shapes.

(v) In a four high rolling mill, there are four rolls out of which
A one is working roll and three are backing up roll
B all of the four are working rolls
C two are working rolls and two are backing up rolls
D three are working rolls and one is backing up roll
E all of the four are backing up rolls.

(vi) To prevent the body of the blade from jamming in the saw cut, the teeth of blade are
A set B sharpened C strengthened D hardened E treated.

(vii) When the dimension is expressed as $20^{+0.035}_{-0.025}$, then the tolerance is
A 0.60 mm B 0.06 mm C 0.01 mm D 0.006 mm E 0.025 mm.

(viii) The grinding machine which can grind to close tolerance finish, harder and non-harder work is known as
A centreless grinder B cylindrical grinder C surface grinder
D pedal grinder E potable angle grinder.

(ix) Parallel Turning is the operation which is performed on
A Drilling machine B Grinding machine C Milling machine
D Shaper machine E Lathe machine.

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(x) The part of twist drill that serves as a way of coolant penetration is known as
A flutes B land C tips D shank E lips.

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SECTION B (30 Marks)

Answer all questions in this section.

2. Define the following with regard to lathe machine:
   (a) Feed rate.
   (b) Setup of machine.

3. Describe the tool in Figure 1 as used in Fitting and Turning workshop.



Figure 1

4. Name three factors which affect the surface finishing of the machined work piece.

5. Differentiate the carriage from apron with regard to lathe machine parts.

6. Sketch a scriber and explain its function in fitting and turning workshop.

7. Distinguish the following materials as used on the grinding wheel.
   (a) Abrasive.
   (b) Bond.

8. State the functions of the following accessories:
   (a) Mandrel.
   (b) Face plate.

9. Differentiate between continues chips and discontinues chips.

10. Name three common holding devices used in drilling machine.

11. Identify the tool in Figure 2 and state its function.

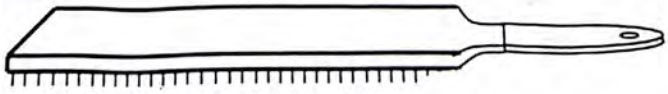


Figure 2

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SECTION C (60 Marks)

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

12. (a) A workpiece of a thickness of 50 mm is to be drilled a hole having a diameter of 35 mm. Calculate the time required for drilling the hole, assume the cutting speed of 22 m/min and feed rate of 0.2 mm/rev are used. Neglect the length of approach. **(10 marks)**

(b) Outline five advantages which make an operator to opt using hydraulic drive in shaping machines. **(10 marks)**

13. (a) (i) Name the parts of the micrometer screw gauge in Figure 3.

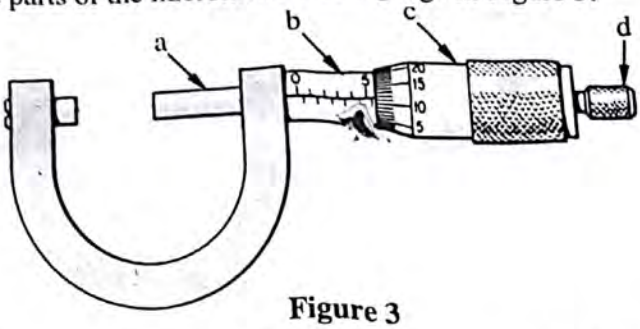


Figure 3

(ii) Explain four procedures to follow when measuring the size of diameter using the micrometer. **(10 marks)**

(b) Briefly describe the following types of calipers with respect to their shape and application:
(i) Hermophrodite calipers. (Odd – Leg Calipers)
(ii) Spring – Loaded Calipers.
(iii) Inside Caliper.
(iv) Outside caliper. **(10 marks)**

14. (a) (i) Give the name of filing methods shown in Figure 4 (i) and (ii).
(ii) Briefly explain the methods of filing in Figure 4 (i) and (ii). **(10 marks)**

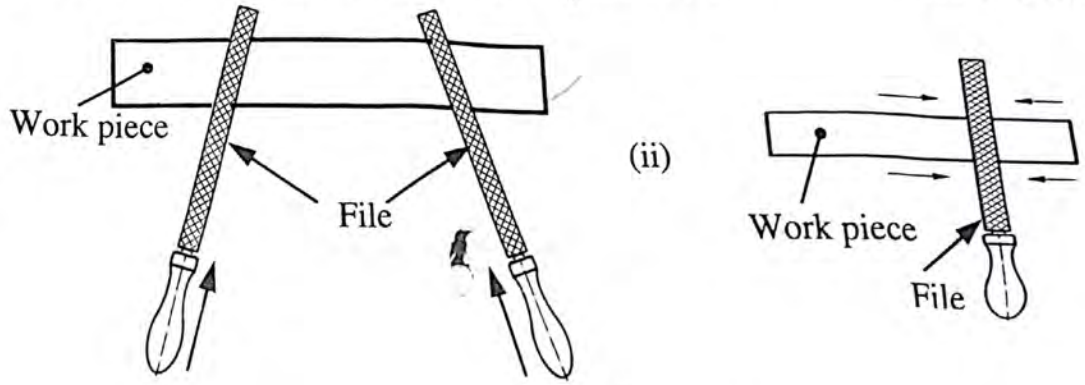


Figure 4

(b) (i) Briefly describe 'pinning' as encountered in filing process, stating its effect and ho can be prevented and removed from a file.

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(ii) Describe the flat and square files according to their shapes and uses. **(10 marks)**

15. (a) Give the meaning of the standard marking system given on grinding wheel as: A – 36 – H – 6 – V – G. **(07 marks)**

(b) Write down six benefit of applying coolant during grinding operations. **(06 marks)**

(c) What are the uses of the following wheel shapes: **(07 marks)**

(i) Straight wheels
(ii) Tapered face wheels
(iii) Ring or cylindrical wheels
(iv) Flaring cup wheel
(v) Form grinding wheels
(vi) Mounted points wheels
(vii) Cup wheels.

16. (a) Describe three methods used for indexing in a milling machine. **(15 marks)**
(b) Describe how spiral milling is performed in a milling machine. **(05 marks)**

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