

Rice₂ Under Cave 1/1/005

JED

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

092

WORKSHOP TECHNOLOGY
(For Both School and Private Candidates)

TIME: 3 Hours

Wednesday afternoon 10/10/2007

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. Electronic calculators are **not** allowed in the examination room.
4. Cellular phones are **not** allowed in the examination room.
5. Write your **Examination Number** on every page of your answer booklet(s).

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This paper consists of 5 printed pages.

SECTION A (10 marks)

Answer all questions in this section.

1. For each of the items (i) – (x) choose the correct answer from among the given alternatives and write its letter beside the item number.
- (i) One of the safety rules states that
- A run fast in the workshop
 - B wear loose clothings when working in machines
 - C make sure that all rotating parts of a machine are uncovered
 - D be safety minded all the time
 - E do not put warning tags on faulty machines.
- (ii) The algebraic difference between the upper and lower limits of the size is known as
- A zone
 - B allowance
 - C limit
 - D fit
 - E tolerance.
- (iii) One of the materials listed below does not melt easily at high temperatures.
- A Plastic material.
 - B Refractory material.
 - C Malleable material.
 - D Ductile material.
 - E Sintered material.
- (iv) The container that carries the charge to the blast furnace is called
- A ballast
 - B skip
 - C laddle
 - D tuyere
 - E blast pipe.
- (v) The furnace that controls accurately the temperature and atmosphere to produce high quality steel is
- A Bessemer converter
 - B electric furnace
 - C open Hearth furnace
 - D blast furnace
 - E cupola furnace.

- (vi) Zinc coating process on ferrous parts is called
- A vulcanizing
 - B carburizing
 - C tin plating
 - D chrome plating
 - E galvanizing.
- (vii) When the micrometer spindle with 0.5 mm thread pitch is given three complete turns, it will advance a distance of
- A 0.5 mm
 - B 0.05 mm
 - C 0.03 mm
 - D 0.15 mm
 - E 1.50 mm.
- (viii) A hard grade-grinding wheel is the one whose abrasive grains are
- A firmly held by the bond
 - B easily removed when grinding
 - C best suited to grind hard metals
 - D best suited to grind without coolant
 - E best for precision grinding.
- (ix) Hand operated feed mechanism enables the operator of the machine to feed the progress of drill through the material being cut. This is termed as
- A machine feed
 - B sensitive feed
 - C force feed
 - D drill feed
 - E operator feed.
- (x) To check the penetration of a drilled hole, one has to use
- A a ruler
 - B a try square
 - C an inside calliper
 - D a depth gauge
 - E a feeder gauge.

SECTION B (30 marks)

Answer **all** questions in this section.

2. Write down **two (2)** types of allowances as used in limits and fits.
3. List **three (3)** common ranges of metric micrometers.
4. Mention **two (2)** types of electric furnaces used for steel production.
 → Electric arc furnace.
 → High-frequency furnace.
5. Enumerate **three (3)** alloying elements in cast iron.
 ← Copper
 ← Zinc
 ← Carbon

6. List **three (3)** semi-finished products of hot rolling.
7. Mention **two (2)** kinds of grinding wheels mounted on bench grinders.
8. Give the ores for production of
- (a) pig iron. - *Hematite*
- (b) magnesium. -
- (c) aluminium. - *Alumina / bauxite*

9. Which process of heat treatment is suitable to subject the following to the stated conditions?

- (a) Mild steel to be hard? - *case hardening*
- (b) Hardened steel to be tough? - *Tempering*

10. List **three (3)** types of cutting fluids that are used in machining operations.

*soluble oil
synthetic fluid
straight cutting oil*

11. Mention **three (3)** forms of supply of engineering materials.

*sheet
bars
strips*

SECTION C (60 marks)

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

12. Define the following:

- (a) A dimension.
- (b) Maximum allowance.
- (c) Minimum allowance.
- (d) Tolerance.
- (e) Limits.

13. (a) Briefly explain what happens if steel is heated above the upper critical temperature and then allowed to cool

- (i) slowly - *Annealing*
- (ii) by quenching. - *hardening*

(b) What happens if steel is heated to the lower critical point? - *tempering*

14. (a) When balancing a grinding wheel, explain how you can distinguish between a balanced wheel and an unbalanced wheel?

(b) What is truing of a wheel?

15. (a) Mention **two (2)** ways of holding drills in a bench drilling machine.
(b) Give **two (2)** functions of T – slots on the work table of a pillar drilling machine.
(c) How can spindle speeds of a bench drilling machine be changed?

- ✓ 16. (a) Mention the metal that replaces wrought iron. *mild steel.*
(b) Explain why machining of wrought iron is difficult? *Because it is tough.*
(c) What percentage of iron does pure wrought iron contain? *99.9% of iron.*
(d) Give **two (2)** properties of wrought iron. *It resist corrosion, it can be easily forged.*