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

094

WELDING AND METAL FABRICATION
(For Both School and Private Candidates)

Time: 3 Hours **Friday, 10th November 2017 p.m.**

CS17PREP

Instructions

1. This paper consists of sections A, B and C with a total of **sixteen** (16) questions.
2. Answer **all** questions in sections A and B and **three** (3) questions from section C.
3. Calculators, cellular phones and any unauthorized materials 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. For each of the items (i) – (x), choose the correct answer from among the given alternatives and write its letter beside the item number in the answer booklet provided.

(i) Which one of the following is a fuel gas?
A Oxygen
B Carbon monoxide
C Oxide
D Acetylene
E Carbon dioxide.

(ii) The function of a hose check valve is
A to mix fuel and oxygen gases to obtain the required melting flame
B to prevent the feedback of gases from regions of higher or lower pressures
C to guide the regulators when the cylinders are connected
D to prevent the damage of cylinders
E to guide the torch during cutting of metals.

(iii) Rectifiers are transformers containing electrical device which changes
A reverse polarity to straight polarity
B AC to DC
C straight polarity to reverse polarity
D Three phase to single phase
E DC to AC.

(iv) In left ward welding technique the welding torch is
A held in the left hand
B held at 90^0 to the horizontal
C moved ahead of the filler rod
D moved from left to the right
E held in the right hand.

(v) When should a multiple bead be used on lap joint?
A When welding in corners.
B When using thin plates.
C When overhead welding.
D When strong joints are required.
E When clean joints are needed.

(vi) Galvanized iron is soft steel coated with
A molten brass
B molten aluminium
C molten zinc
D a plastic layer
E molten solder.

(vii) Which current is the most efficient during MIG welding?
A Direct Current Reverse Polarity (DCRP).
B Direct Current Straight Polarity (DCSP).
C Alternating Current (AC).
D Direct Current (DC).
E Low current.

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(viii) The edge preparation process in welding involves
A shaping the edges of the metal to accommodate the electrode diameter
B shaping of the edges to accommodate the weld metal and allow penetration
C straightening the edges by grinding
D heating the edges of the metal before welding
E filing the edges to dead smooth finishing to allow bonding with weld metal.

(ix) The reason of preheating medium and high carbon steel before cutting with oxyacetylene flame is
A to refine the grain structure
B to improve the quality of the cut
C to eliminate carbon
D to prevent hardening and cracking
E to prevent bending.

(x) Which of the following are non destructive tests of a weld?
A X-ray and die penetrants.
B Gamma ray and impact test.
C Vicker's test and die penetrants.
D Hardness and impact tests.
E Ultrasound and hardness test.

SECTION B (30 Marks)

Answer all questions in this section.

2. Name three materials used to prevent the acetone escaping with gas in acetylene cylinders.

3. Give two functions of an electrode holder.

4. Define the following terms:
   (i) Weld puddle
   (ii) Weld pass.

5. List three gases which are used in gas shielded arc welding.

6. How is heat for resistance welding obtained?

7. What type of ox acetylene flame is suitable for each of the following operations?
   (i) Bonze welding
   (ii) Hard-facing of steel
   (iii) Steel welding

8. Distinguish a welding nozzle tip from a cutting torch tip.

9. Why a filler rod is employed in gas welding?

10. Name three tools or equipment which are used to clean corroded work surface before welding.

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11. Outline three methods of heating a soldering iron.

SECTION C (60 Marks)

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

12. (a) State two factors in which the adjustment of welding flame depends. **(02 marks)**
    (b) With the aid of diagrams, briefly explain three distinct oxy-acetylene flames settings and their uses. **(18 marks)**

13. (a) With aid of diagram, mention the components which are comprised by manual metal arc welding equipment in a set up for welding. Exclude the work bench. **(10 marks)**

    (b) With the aid of diagrams, briefly explain the two types of vertical welding positions. **(10 marks)**

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14. (a) Explain how brazing is carried out. **(12 marks)**
    (b) Give two advantages and two disadvantages of brazing. **(08 marks)**

15. (a) Why is it important for a sheet metal worker to know the type of material of the required sheet metal for a particular job? **(03 marks)**

    (b) What is the function of each of the following machines in sheet metal works?
    (i) Rolling machine
    (ii) Bending machine
    (iii) Shearing machine
    (iv) Folding machine
    (v) Double seaming machine
    (vi) Grooving machine. **(09 marks)**

    (c) Give a brief explanation of properties and uses of the following sheet metal materials.
    (i) Tin
    (ii) Aluminium. **(08 marks)**

16. (a) How does distortion occur to a heated metal in welding process? **(04 marks)**

    (b) Explain three main types of distortion that can be set up in welded structures, if care and preventive measures are not taken. **(06 marks)**

    (c) Give any five ways to eliminate the effects of distortion during welding of metals. **(10 marks)**

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