

**THE UNITED REPUBLIC OF TANZANIA
NATIONAL EXAMINATIONS COUNCIL OF TANZANIA
DIPLOMA IN TECHNICAL EDUCATION EXAMINATION**

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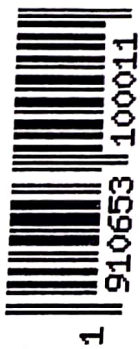
WELDING AND FABRICATION

Time: 3 Hours

Wednesday, 08th May 2019 a.m.

Instructions

1. This paper consists of **eight (08)** questions.
2. Answer **five (05)** questions only.
3. Each question carries **twenty (20)** marks.
4. Communication devices, programmable calculator and any unauthorized materials are **not** allowed in the examination room.
5. Write your **Examination Number** on every page of your answer booklet(s).



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1. (a) What is meant by the terms "backfire" and "flashback" as applied in gas welding system?
(b) Outline three causes and three corrective measures of backfire and flashback.
(c) Why should the acetylene needle valve be closed first in shutting off the torch?
2. (a) Why acetylene gas cylinders are packed with porous material?
(b) With the aid of sketches, distinguish the three oxy-acetylene flames.
(c) Establish five sequential steps for shutting off the oxy-acetylene torch.
3. (a) What is soldering flux in metal welding?
(b) Why fluxes are used during soldering operation and removed after operation? Give two reasons.
(c) Using six points, differentiate between brazing and electric arc welding.
4. (a) Outline six safety precautions to be observed in welding and metal fabrication workshop.
(b) Basing on the classes of fire, describe six types of fire extinguishers.
(c) Suppose you are in the workshop and an arc welding machine catches fire in the state that you cannot switch off the electric current supply; which type of fire extinguisher you will use to fight the fire? Give reasons for your choice.
5. (a) Write the meaning of each of the following terms as applied in forging processes:
 - (i) Drawing down
 - (ii) Fullering
 - (iii) Piercing
 - (iv) Jumping or upsetting
(b) List down three advantages and three disadvantages of drop forging.
(c) Analyse six factors to be considered in designing the components to undergo forging processes.
6. (a) Briefly explain four steps involved when making spot welding operation.
(b) With the aid of sketches, differentiate between spot welding and projection welding.
7. (a) Outline four preventive measures to be taken in order to eliminate or minimize Arc blow when welding by using DC welding machine.

- (b) Analyse three causes and three remedies of the following welding defects:
- (i) Porosity and blow holes.
 - (ii) Slag inclusions.
 - (iii) Incomplete fusion and penetration.
8. (a) With the help of simple sketches, describe roll welding and fixed position welding as applied in welding pipes using an oxy-acetylene torch.
- (b) Identify three precautions to be taken in order to encounter distortion problems during pipe welding.
- (c) What is the main challenge in practicing pipe welding?
- (d) Briefly explain the number of welders required for pipeline welding.