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BUGESERA DISTRICT

TSS 2nd TERM DISTRICT COMPREHENSIVE ASSESSMENT
SCHOOL YEAR: 2024-2025

SECTOR: CONSTRUCTION AND BUILDING SERVICES

TRADE: BUILDING CONSTRUCTION

RQF LEVEL: LEVEL 3

MODULE CODE AND TITLE: BDCSB301 PRODUCTION OF SOIL BASED BRICKS AND BLOCKS

DURATION: 3hours

DATE: / / 2025

...../100
MARKS

INSTRUCTIONS TO CANDIDATE:

- ✓ This exam has three sections.
- ✓ Maximum marks...../...100Marks
- ✓ Attempt all Questions in A
- ✓ choose only three questions among five questions in section B.
- ✓ Choose only one question among two question in section C.
- ✓ Use pencil to draw any sketch mandatory
- ✓ Draw a line after answer the question

TSS 2nd TERM DISTRICT COMPREHENSIVE ASSESSMENT
SCHOOL YEAR: 2024-2025

Section A Attempt all Questions**(55marks)**

- Q1.** What are the raw materials used to make soil-based bricks or blocks? **(2marks)**
- Q2.** How would you compare the advantages of volume batching and weight batching in a soil production? **(3marks)**
- Q3.** Match each step of the de-molding process with its correct description. **(4marks)**

Steps of De-Molding	Descriptions
1. Preparation for De-Molding	A. Allowing the de-molded bricks to dry and gain strength before further handling.
2. Removal of the Brick from the Molding	B. Ensuring the mold clean and applying a release agent to prevent sticking
3. Curing Process after De-Molding	C. Checking for cracks, deformities, or inconsistencies before sending the bricks for final curing or use
4. Inspection and Quality Control	D. Carefully extracting the brick from the mold using manual or mechanical methods to avoid damage

- Q4.** Define the following term: **(3marks)**
- a. Tools:
 - b. Equipment:
 - c. Materials
- Q5.** Design an experiment to test and compare the strength, durability and thermal insulation properties of different soil-based bricks and blocks. How would you improve their composition for better performance **(3marks)**
- Q6.** Rearrange the following steps in the correct order for preparing clay: **(3marks)**
- Weathering, Tempering, Digging, Un-soiling, Cleaning, Blending,
- Q7.** Compare the Plastic Clay Method from the Dry Machine Method of brick-making **(4marks)**
- Q8.** What type of kiln is known for its continuous firing process? **(2marks)**
- Q9.** Select the letter corresponding to the correct answer in each statement **(5marks)**

1. Which kiln is most suitable for small-scale brick production due to its low construction cost and simplicity?

- a. Vertical Shaft Brick Kiln (VSBK)
- b. Clamp Kiln
- c. Hoffmann Kiln
- d. Tunnel Kiln

2. Which kiln is best known for being an environmentally friendly option due to its low fuel consumption and reduced carbon emissions?

- a. Hoffmann Kiln
- b. Bull's Trench Kiln (BTK)
- c. Clamp Kiln
- d. Vertical Shaft Brick Kiln (VSBK)

3. Which type of kiln is a continuous kiln that allows for efficient and uniform brick firing?

- a. Hoffmann Kiln
- b. Clamp Kiln
- c. Periodic Kiln
- d. Pit Kiln

4. Which kiln operates in a trench and is commonly used in South Asia for brick production?

- a. Hoffmann Kiln
- b. Tunnel Kiln
- c. Bull's Trench Kiln (BTK)
- d. Vertical Shaft Brick Kiln (VSBK)

5. Which type of kiln is a modern, high-efficiency kiln that operates on a continuous basis and is often used for large-scale production?

- a. Hoffmann Kiln
- b. Tunnel Kiln
- c. Clamp Kiln
- d. Pit Kiln

Q10. Mention the raw materials for making compressed stabilized earth blocks. **(3marks)**

Q11. List any two (2) defects that can be found on the compressed stabilized earth blocks their possible causes and solution. **(2marks)**

Q12. Answer by true or False

(5marks)

- a. The water-to-clay ratio in brick-making does not affect the final strength of the brick.
- b. If a brick needs to be more fire-resistant, adding more clay and less sand can be a solution.
- c. Bricks made with a higher proportion of sand are more suitable for load-bearing walls.
- d. In regions with high rainfall, adding waterproofing agents to brick mixtures can enhance durability.
- e. The best way to create a lightweight brick is by increasing the amount of clay while reducing other materials.
- f. A lower ratio of water in the mixture leads to denser and stronger bricks.
- g. The ratio of ingredients used in brick-making is the same for all types of bricks.
- h. The primary ingredients of bricks are clay, sand, and water.
- i. Bricks are made by mixing cement with steel fibers.
- j. Increasing the sand content in a brick mixture reduces its overall strength.

Q13. Give any two (2) main stages natural drying and specify each time taken in brick production **(4marks)**

Q14. Describe soil composition for burnt bricks. **(3marks)**

Q15. Explain of the term “pouring” in adobe block making **(2marks)**

Q16. Choose the letter corresponding to the correct answer in each statement: (4marks)

1. Which type of soil is most suitable for kiln construction?

- a. Sandy soil
- b. Clay-rich soil
- c. Rocky soil
- d. Highly acidic soil

2. Why should a kiln be located away from residential areas?

- a. To reduce air pollution and health risks
- b. To make transportation easier
- c. To prevent brick theft
- d. To ensure better access to workers

3.What is the advantage of having a kiln site near a water source?

- a. It helps in maintaining kiln temperature
- b. It speeds up the firing process
- c. It reduces smoke emission
- d. It is useful for preparing raw materials like clay

4.What role does wind direction play in kiln site selection?

- a. Helps to control smoke dispersion
- b. Affects the color of fire bricks
- c. Reduces the need for ventilation
- d. Determines the size of the kiln

Q17. Outline three essential tools used in brick manufacturing using the hand method
(3marks)

SECTION B choose only three questions (30marks)

Q18. Sedimentation test this process is also known as bottle test for determining the proportion of clay and sand particles in the soil discuss steps to be followed to perform those test.
(10marks)

Q19. Explain the importance of batching ingredients accurately in adobe block production. How do variations in soil composition, water content, and stabilizers affect the quality and durability of adobe blocks?" (10marks)

Q20. Differentiate between clamp and burning kiln according to the following terms:
(10marks)

- a. Regulation of fire:
- b. Structure:
- c. Skilled supervision:
- d. Capacity:
- e. Quality of bricks:

Q21. Producing soil-based bricks and blocks, such as compressed stabilized earth blocks (CSEBs) or traditional mud bricks, requires specialized equipment for soil preparation, mixing, molding, compacting, and curing. describe equipment for production of soil-based bricks and blocks
(10marks)

Q22. The choice between manual and automated equipment in brick production depends on factors such as cost, production scale, labor availability, and quality consistency. What are the advantages and disadvantages of using manual vs. automated equipment in brick production?
(10marks)

(15marks)

(15marks)

[illegible]