# NATIONAL BUSINESS AND TECHNICAL EXAMINATIONS BOARD NATIONAL TECHNICAL CERTIFICATE EXAMINATION

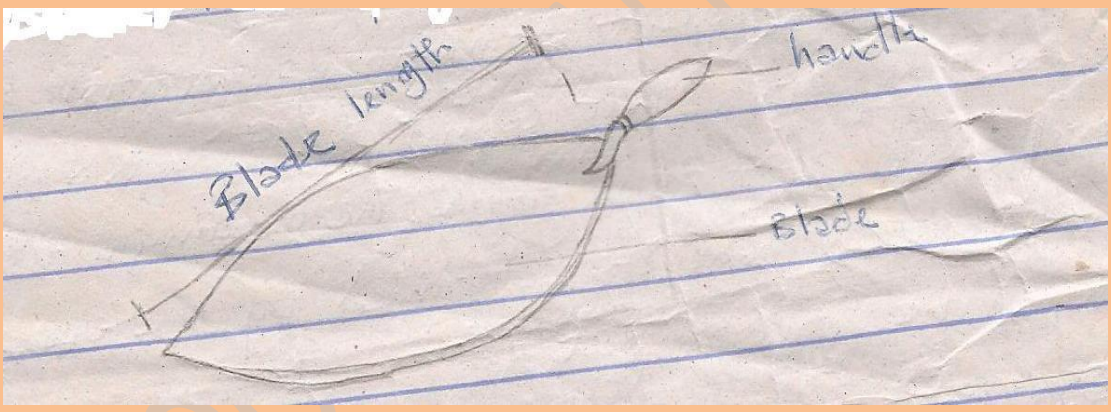
## BLOCKLAYING/BRICKLAYING/CONCRETING

**QUESTION 1**

With the aid of neat sketches, show the following tools/equipment:

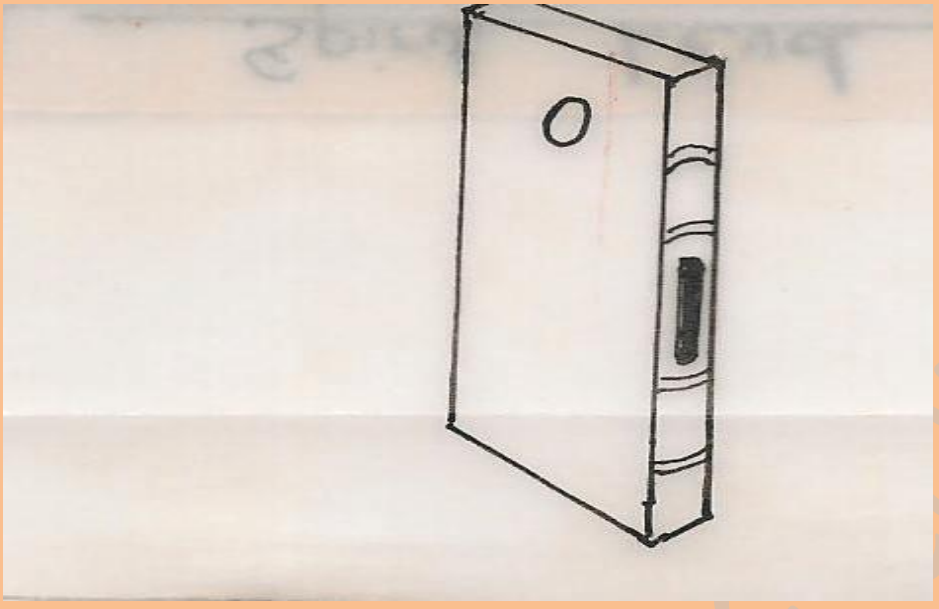
(i) Brick/Block laying trowel
(ii) Spirit level
(iii) Laying on trowel
(iv) Float

**ANSWER**

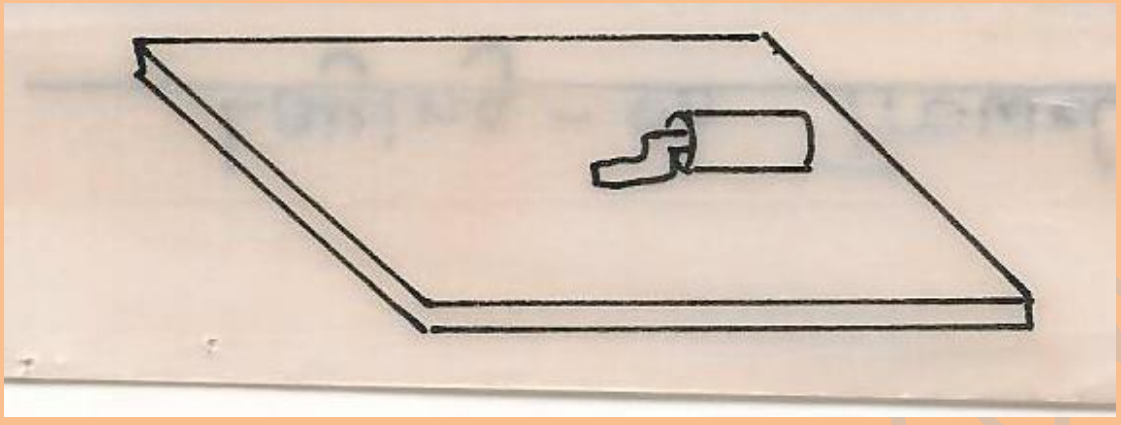



(i) Brick/block laying trowel

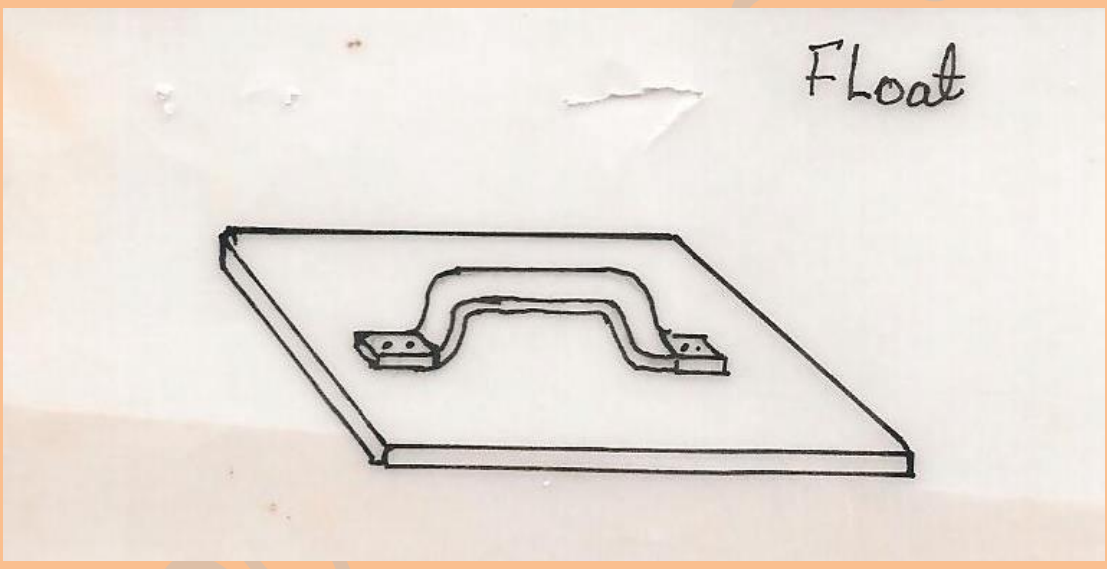
(ii) Spirit level



(iii) Laying-on Trowel



(iv) Float




**QUESTION 2**

A. Explain the basic differences between coarse and fine aggregates.

**ANSWER**

Coarse aggregates consist primarily of materials large enough to a proportion that cannot pass through a standard sieve of 4.76mm radius. The maximum size of coarse aggregate is however determined by the class of work to be carried out.

Fine aggregate is made up of materials small enough to pass through a seize of 4.76mm radius

B. Give two (2) examples of each coarse and fine aggregates

Examples of coarse aggregates include:

(i) Natural gravel
(ii) Crush stone
(iii) Clinker
(iv) Sand stones

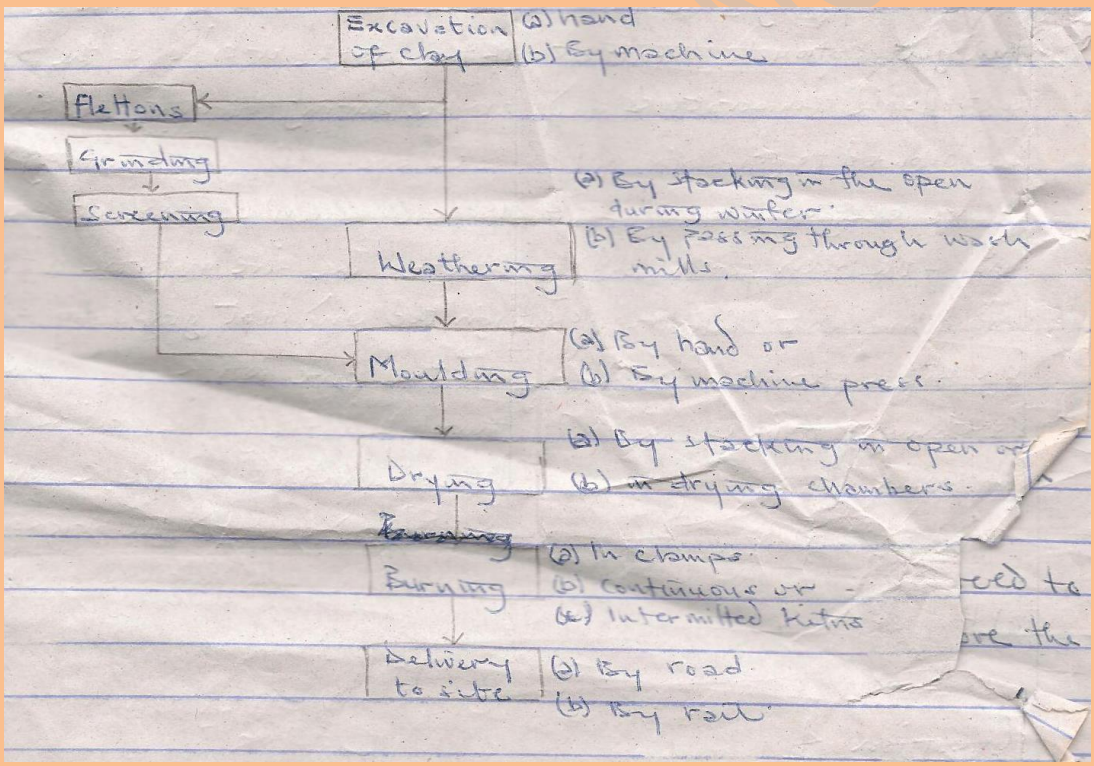
While, fine aggregates include:

(i) Natural sand
(ii) Crushed gravel
(iii) Crushed stone

**QUESTION 3**

A. With the aid of a line diagram, show the process of manufacture of clay bricks

**ANSWER**



B. Explain in detail the difference between continuous and intermittent kilns

**ANSWER**

| CONTINUOUS KILN | INTERMITTENT KILN |
|---|---|
| In this type of kiln, dried clay bricks otherwise known as green bricks are loaded into steel trucks to form a continuous line that passes into a long chamber that has a firing zone of high temperatures at the centre of it's length. The trucks are then passed gradually through the kiln. The bricks get warmed as they reach the firing zone. The bricks then get cautiously burnt at controllable temperatures and are allowed to gradually cool before emerging at the exit end of the kiln for unloading and subsequent delivery to site. One notable example of the continuous kiln is the Hoffman type. | In intermittent kilns, bricks are molded, dried and stacked either in enclosures like in the scotch kiln or down-draught kiln. Sometimes the bricks are loaded in exposed sites out the sides and tops of stacks , green bricks are covered with under-burnt bricks to protect the bricks from weather effects likely to affect it before firing. In both cases of intermittent kilns however, fire-holes are provided at bases of the stocks or sides as the case maybe. During burning, the fire-holes are filled with burning material such as coal or coke breeze. The fire material is then ignited and heat gradually rises as the fire works increases thereby burning the bricks to the required temperature which bakes and hardened the bricks to a useful building material. |

**QUESTION 4**

A. State four (4) precautions to be taken when laying screed to an old concrete floor.

**ANSWER**

Precautions to be taken before laying screed to an old concrete floor.

(i) Clean off the surface of the concrete floor thoroughly
(ii) Remove only laitance or scum on top of the concrete floor.
(iii) Hack the surface of the concrete to ensure good bondage either manually or mechanically with a hack hammer.
(iv) Wet the surface with water to ensure hardening and shrinkage of screed and slab simultaneously. This also prevents detachment of screed from the concrete base .

B. Explain briefly, the following methods of construction used for lay screed finishes.
(i) Monolithic method.
(ii) Separate

**ANSWER**

(i) Monolithic method:- This involves laying the screed within three hours of cast-in-situ concrete slab. The mix is prepared in the proportion of 1:1:2 by weight of cement fine aggregate or sand and coarse aggregate. The amount of water is just enough to obtain a

workability that enhances full compaction. The screed thickness ranges from 12mm to 40mm depending on the slab and purpose of which the floor is prepared.

(ii) Separate method:- This is the application of the screed to a concrete slab that is cast, set and hardened before the screed is laid on top to finish the floor. In this case, the proportion of mix is similar to the monolithic type of screeding but the procedure for casting is done in bays of not exceeding $15m^2$.Again, in separate method of screeding, caution has to be taken as the slab is to be thoroughly cleaned, laitance and scum removed, the slab also has to be hacked and finally wet with water before screed is laid.

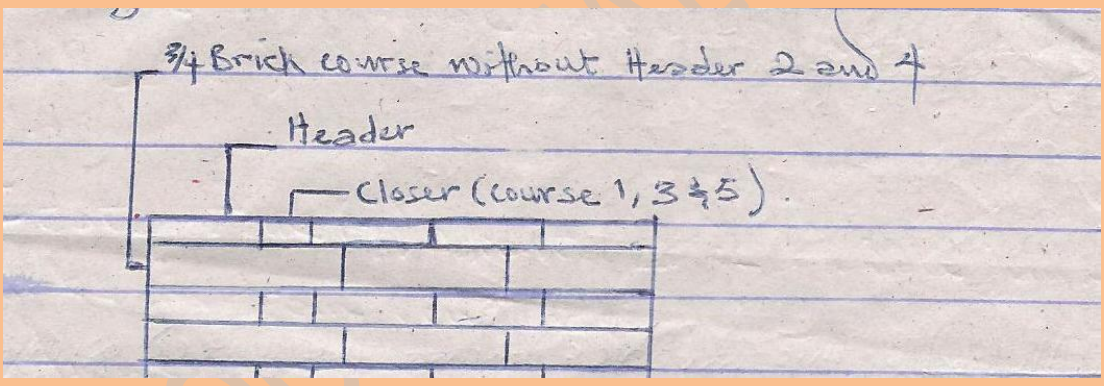
**QUESTION 5**

Show with sketches the elevation of the following types of bond up to five course:

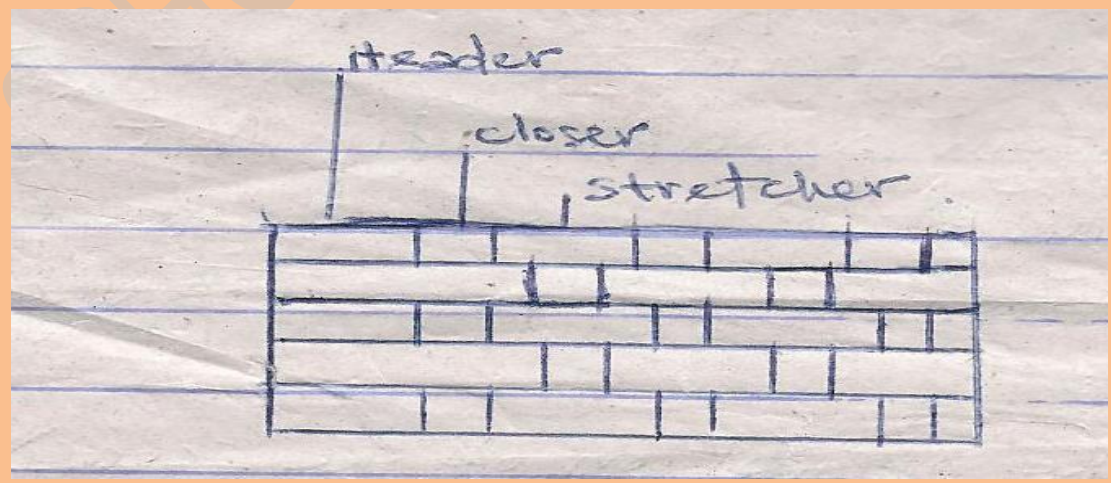
(i) English
(ii) Flemish
(iii) Header

**ANSWER**

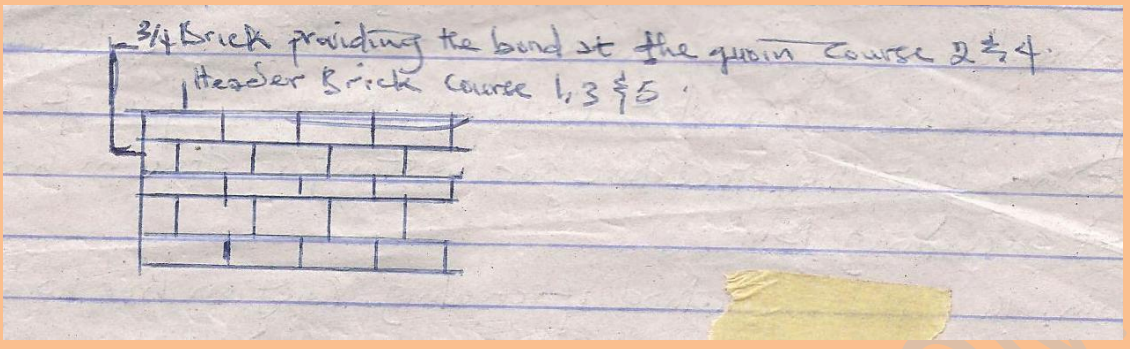
(i) English bond




(ii) Flemish bond



(iii) Header bond




**QUESTION 6**

State six (6) safety regulations to be observed in the erection of tubular scaffolding.

**ANSWER:**

(i) The scaffolds should be erected under the supervision of a competent personnel.
(ii) They should conform with the construction requirements as contained in the Health and Safety work Act.
(iii) The scaffold should be strong enough to avoid accidents usually caused by their fall or collapse.
(iv) The scaffold should be rigid and fit to carry both work men and materials while in use.
(v) The standards or vertical supports upon which the load is transmitted should rest on a solid base.
(vi) Platforms should be closely and firmly boarded together and should be wide enough to carry both men and materials.
(vii) The board should be provided on all platforms higher than 2m and 200mm above the top of the platform.
(viii) Guard rails should be provided on all platforms and fixed on the sides of the standards. Heights of guard rails from top of platform should not be more than 900mm.
(ix) Ladders used for access to various platforms of the scaffold should be firmly secured at the top and rest on a solid base or wall.

**QUESTION 7**

A. State four (4) advantages of pitch fibre pipes.

**ANSWER**

Advantages of pitch fibre pipes include:

(i) They are used for both domestic and trade wastes.
(ii) They are produced in portable nominal length ranges from 1.7m to 3.0m.
(iii) They also have nominal standard bores which range from 50mm to 225mm.
(iv) They are flexible in their tapered end connection
(v) They are more economical to use in bad ground conditions than clay pipes.
(vi) They can also be coupled with snap ring rubber seals to enhance longitudinal flexibility (the expansion and contraction).

B. State four (4) advantages of flexible joints over rigid joints in drain construction.

**ANSWER**

Advantages of flexible joints over rigid joints include:

(i) Flexible joints produce the economy of expansion but rigid joints are prone to damage under bad ground conditions.
(ii) Rigid joints are usually applied to pipes of smaller bores made mainly of clay or concrete materials while flexible joints could be applied to both small and bigger sizes of pipes providing additional protection to the joints.
(iii) Flexible joints when jointly used with the pipes have ability to absorb movement and distribute the pressure uniformly over the surface area of its coverage.
(iv) Flexible joints are made of more durable materials and can withstand both thermal and other forces exerted on them.