

UNIVERSITY OF SWAZILAND
Faculty of health and Sciences
DIPLOMA IN ENVIRONMENTAL HEALTH
FINAL EXAMINATION PAPER 2006

TITLE OF PAPER : BUILDING CONSTRUCTION TECHNOLOGY
COURSE CODE : EHS 206 PART (A) MULTIPLE CHOICE
DURATION : 2 HOURS
MARKS : 100
INSTRUCTIONS : THIS PAPER CONTAINS 100 QUESTIONS
: ANSWER ALL QUESTIONS
: USE A PEN TO COMPLETE ALL PARTS OF
: IN THE ANSWER BOOK PROVIDED
: EACH QUESTION CARRIES 1 MARK
: EACH QUESTION HAS FOUR POSSIBLE
: ANSWERS LETTERED a, b, c, d
: DECIDE WHICH ONE IS CORRECT AND
: CIRCLE IN THE APPROPRIATE QUESTION
: NUMBER IN YOUR ANSWER BOOK WITH A
: PEN
: IF YOU DECIDE 'C' IS CORRECT, CIRCLE
: THE APPROPRIATE LETTER LIKE THIS
 1. a.
 b.
 Ⓒ.
 d..
: IF YOU WANT TO CHANGE YOUR ANSWER
: CANCEL YOUR FIRST CHOICE, THEN
: CIRCLE THE ONE THAT YOU HAVE NOW
: DECIDED TO CHOOSE
: ANY CALCULATIONS OR ROUGH WORK
: MUST BE DONE ON THE QUESTION PAPER,
: CALCULATIONS MAY BE USED BUT THEY
: MUST BE SILENT AND NON-
: PROGRAMMABLE
: NO PAPER SHOULD BE BROUGHT INTO OR
: OUT OF THE EXAMINATION ROOM

DO NOT OPEN THIS QUESTION PAPER UNTIL PERMISSION IS GRANTED BY THE INVIGILATOR.

1. Steel reinforcement Rods are introduced to concrete in order to:
 - a. Resist compression force in concrete
 - b. Resist tension in concrete
 - c. Increase lateral forces in concrete
 - d. Increase buckling in concrete
2. Steel bars are placed 25mm or 40mm from the bottom of the lintel in order to:
 - a. Promote the rate of corrosion
 - b. Minimise the spread of fire
 - c. Give protection against corrosion
 - d. Make the concrete lintel to be more durable.
3. Cement mortar is sometimes described as:
 - a. Lime mortar
 - b. Masonry cement mortar
 - c. Gauged mortar
 - d. Plasticised mortar
4. Mortar joints in brick/block are given a finish after the walls have been built to prevent the penetration of moisture through the mortar joints and to form a neat appearance. Which of the following mortar process best define the above statement:
 - a. Pointing
 - b. Jointing
 - c. Plastering
 - d. Facing
5. For a building to be in the squareness the diagonals should be:
 - a. Not equal
 - b. Parallel
 - c. Form Triangles
 - d. Equal
6. Foundation widths when setting out building are marked **DN**:
 - a. The ground floor
 - b. The concrete stabs
 - c. The profile boards
 - d. The four stout pegs
7. The term course in brick or block wall construction means:
 - a. The number of bricks or blocks in the height of a wall
 - b. A line of bricks or blocks in the height of a wall
 - c. The pattern of laying the bricks or blocks
 - d. The number of lines of vertical and horizontal mortar joints
8. The term course rod in wall Construction means:
 - a. A straightedge that we use to make the bricks straight in a wall
 - b. A tool used for leveling and plumbing the walling units
 - c. A plank that we mark the brick height with the mortar-joint or the number of courses
 - d. A spirit level
9. Which of the following methods Would a brick/block layer use when setting out a rectangular building to ensure that its corners are at 90°
 - a. Bricklaying trowel
 - b. Spirit level
 - c. A 3 : 4 : 5 rule of thumb
 - d. A 30 metre tape

10. Oversite concrete is used as
- A formation level for laying bricks
 - A layer of concrete to receive a screed
 - A barrier to moisture that might rise from the ground and stop the growth of vegetable topsoil
 - A dpm between the floor concrete slabs and hardcore

11. The most recommended type of bond used in block work is

- English garden wall bond
- Stretcher bond
- Flemish garden wall bond
- Garden wall bond

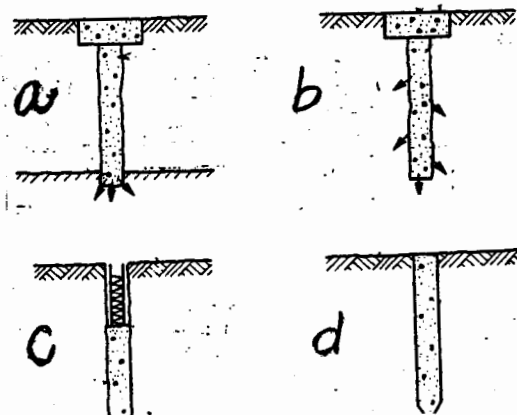
12. The term Built Environment can be Defined as

- God's creation
- Dams, rivers, seas and roads
- Created by man with or without the aid of the natural environment
- Surroundings which can be natural

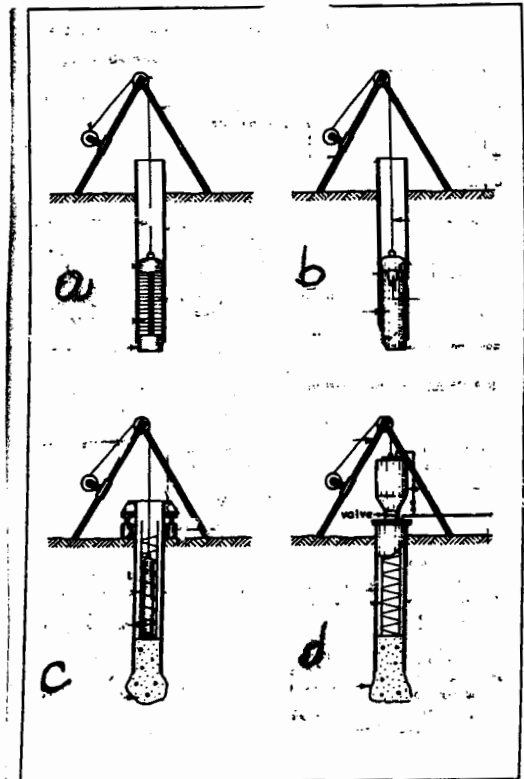
13. Substructure work can be defined as

- All partition walls with openings
- All structure below the dpc level of a house
- All rods, windows, doors and ceiling
- All structure above the dpc including internal and external features

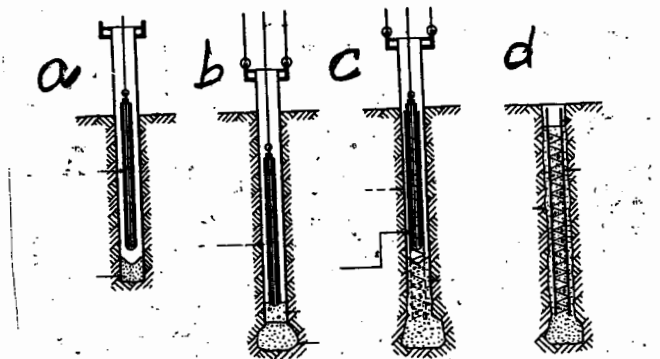
14. Which of the following classification of piles illustrates a replacement



15. Which of the following sketches illustrate forming a pile using a drop hammer



16. Which of the FRANKI Driven insitu pile illustrate the process of forming enlarged toe or base



17. A bed of hardcore may be required on a building site to:

- Fill the volume of soil stripping and form a concrete base for partition walls
- Prevent the growth of vegetable matter under the oversite concrete slab and raise the level of oversite concrete slab
- Fill hollows and raise the finish level of an oversite concrete slab after the removal of turf and vegetation
- Decompose the turf and vegetation and make a hard base of the casting oversite concrete

18. Which statement defines Flemish bond in brickwork:

- A wall that consists of stretches throughout and the centerline of each stretcher is directly over the centerline of the cross joint in the course below
- A wall that consists of stretchers throughout the length of the one course and header throughout the next course
- A wall that reduces the number of headers and the cost of facing bricks, yet at the same time to produce a reasonable appearance and strength
- A wall that has bricks laid alternate headers and stretchers in the same course, the header in one course being the centre of the stretcher in the course above and below

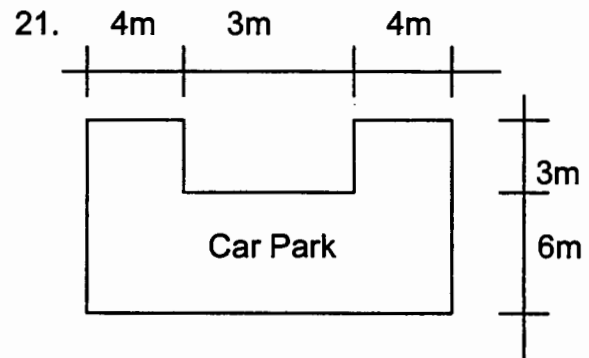
19. The dpc to suspended timber ground Floor should be placed on top of the:

- Oversite concrete under the sleeper wall

- Sleeper walls under the wall plate
- Wall plate under the joist
- Joist under the floorboards

20. A building line is referred to as:

- A line drawn at the centre of the existing road for setting out a building
- A level fixed to which references pertaining to levels for the construction of the project are referred
- A statutory line fixed by authorities in terms of dimensions beyond which no building may project and normally fixes the front line of all buildings along a road or street
- Boundaries of the plot where dimensions for setting out a building are referred



What is the area of the paving for the car park?

- 90m²
- 99m²
- 72m²
- 97m²

22. In staircase construction the "going" is:

- The horizontal distance between the nosing of the tread or landing next above it

- b. The vertical distance between the Upper surface of two consecutive treads
- c. The front edge of a tread projecting beyond the face of the riser and including the edge of a landing
- d. The vertical part of a step between two consecutive treads

23. A suitable scale for drawing sections is:

- a. 1 : 1
- b. 1 : 500
- c. 1 : 50
- d. 1 : 100

24. Which of the following statements best defines an angle that could be drawn as an obtuse angle

- a. Formed by two lines meeting at 90°
- b. Formed by two lines intersecting at an angle greater than 90° but less than 180°
- c. Formed by two lines meeting at less than 90°
- d. The difference between the given angle and 180°

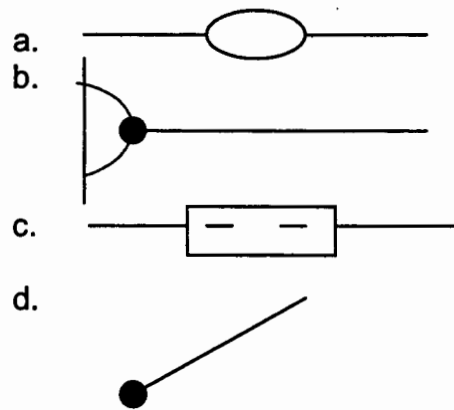
25. The majority of working drawing consists of plans, sections, and elevations drawn by orthographic projection, whereby they are all in flat places. Which of the following statements best defines the term "Plan" in working drawing:

- a. Angular perspective for external views of buildings and parallel perspective which is normally used for interior
- b. A view from above of an object in a horizontal plane. Normally

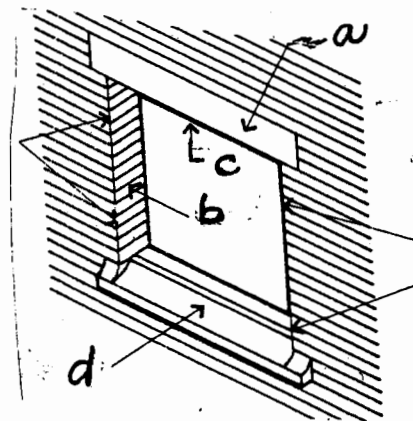
drawn of each floor about 1m above floor level, looking down at the floor and cutting through walls, doors and windows.

- c. Projection in which length, breadth and height of the object are shown on the one drawing
- d. Representatives of external faces of a building including windows and doors

26. Which of the following symbols would represent an Inspection Chamber:



27. On the figure below, which arrow indicates a reveal on a window opening



28. Folding wedges are used whenever possible with trench timbering and timber form work in order to:

- a. Permit the use of variable lengths of timber

- b. Accommodate uneven bearing surface
 c. Allow for easing
 d. Distribute the load
29. Load bearing walls can be defined as:
- a. Walls carrying imposed Loads and their own weight
 b. Walls carrying the weight of floors and roofs only
 c. Walls acting as partition walls
 d. Walls classified as external and internal
30. The function of a retaining wall is to:
- a. To support the walls above the dpc level
 b. Act as cofferdams
 c. Act as an earth retaining structure for the whole or part of its height on the face, the other being exposed to the elements
 d. Support compression forces only
31. Which type of floor needs a ventilated space during its construction:
- a. Solid ground floors
 b. Pre cast concrete floors
 c. Upper floors
 d. Suspended timber ground floors
32. The slump test on a fresh concrete is used for testing:
- a. The compression strength

- b. The workability of concrete
 c. The tensile strength
 d. The compaction factor of concrete
33. Concrete is compacted in order to:
- a. Remove entrapped air and fill voids
 b. Make it set and harden faster
 c. Promote segregation
 d. Make it dense
34. What is the mean perimeter or centerline of the ground floor plan below when its foundation width is 650mm:

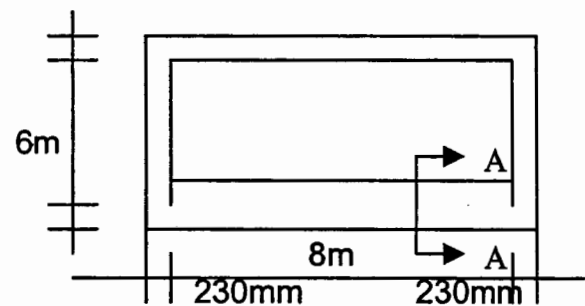


FIG 1

- a. 28.920m
 b. 27.920m
 c. 28.000m
 d. 27.000m
35. What is the volume of excavation of the above figure, utilizing the section below

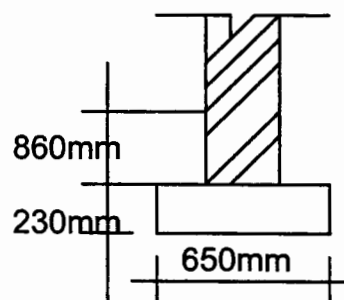


FIG 2

- a. 16.166m³
- b. 17.500m³
- c. 16.500m³
- d. 15.223m³

36. A ground floor measuring 5.2m x 3m is to be reboarded. Allowing 10% wastage, the total area of flooring required is:

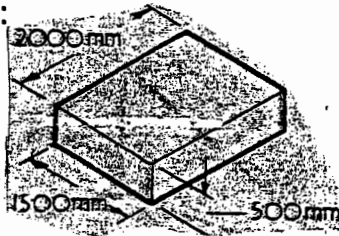
- a. 15.6m²
- b. 16.16m²
- c. 17.16m²
- d. 17.6m²

37. The material cost per cubic metre of concrete is as follows

Cement	E40.00
Sand	E30.10
Gravel	E37.00

The total cost of concrete material required for the base below would be:

- a. E100.95
- b. E160.65
- c. E260.65
- d. E160.00



38. In a traditional drawing office a protractor is used for:

- a. Increasing and drawing angles of 180°
- b. Measuring and drawing angles of 360°
- c. Measuring or for setting out angles
- d. Measuring or for setting out Curves

39. Draughtsmen in a drawing office uses dividers for:

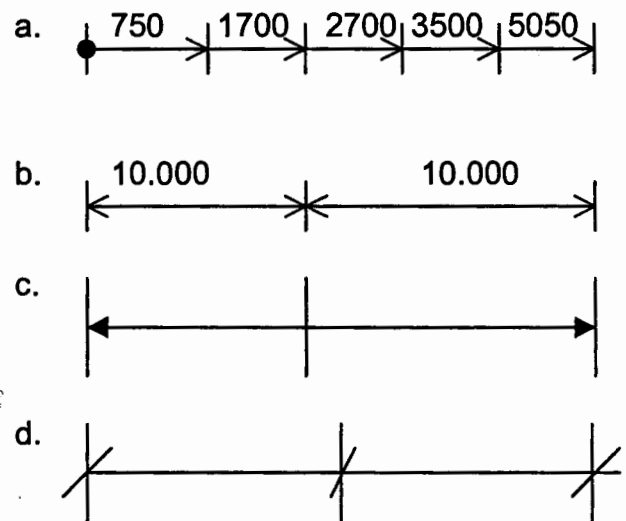
- a. Drawing circles and areas
- b. Drawing large circles
- c. Drawing straight lines in ink

d. Dividing lines into equal units by trial and error and multiplying or transferring distances

40. A suitable scale for drawing sections is:

- a. 1 : 1
- b. 1 : 10
- c. 1 : 50
- d. 1 : 20

41. Which of the following dimension lines illustrates a running dimension.



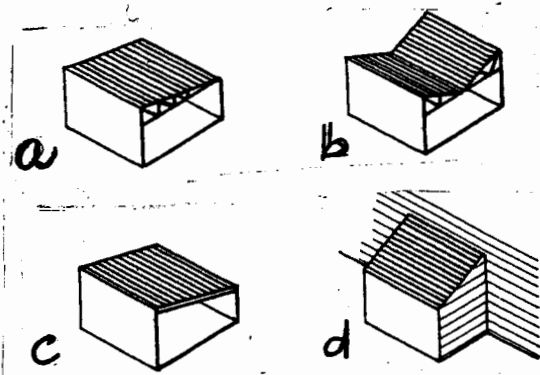
42. For solid ground floors to perform their requirements they must have:

- a. A dpc
- b. A dpm
- c. Hardcore
- d. River sand blinding

43. Sleeper walls are sometimes known as:

- a. Honeycomb walls
- b. Load bearing walls
- c. Retaining walls
- d. Partition walls

44. Which of the following roofs illustrates a monopitch with trussed rafters?



45. Poling boards are parts of a trench support in timbering. Which statement best defines poling boards
- Horizontal members placed against the poling boards at predetermined centre
 - Horizontal members placed at right angles to and abutting the walling boards
 - Vertical members placed against the excavation sides
 - Vertical members positioned to support wallings or horizontal boarding
46. Which drawing would be used drawing Msunduza Town Location:
- Ground floor plan
 - Block plan
 - Site plan
 - Elevation
47. The main function of a plain concrete strip foundation for a house
- prevent small amount of even settlement

- transmit the combined dead and imposed Load to the ground
- provide a level base for load bearing walls
- provide sufficient area related the width of wall

48. Which of the following test is used to measure consistence of consistence of conventional concrete:

- flow test
- splitting test
- vebe test
- slump test

49. The main aim of compacting concrete is to:

- cause bleeding
- bring water and the cement on top of the concrete
- create segregation
- remove entrapped air from the concrete and fill the voids

50. A 1 : 2 : 4 concrete mix ratio means

- Mass concrete
- Dense concrete
- Reinforced concrete
- Oversite

51. Which one of the following comments of drainage systems should be used at point 'A' in fig 2

- an inspection chamber
- an interceptor
- a rodding point
- a vent

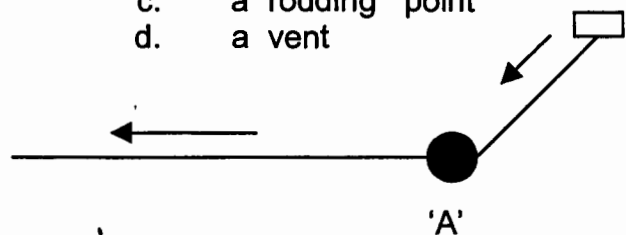


FIG 2

52. Which of the concrete mixes is used for an ordinary strip foundation or mass concrete work.

- a. 1 : 2 : 4
- b. 1 : 3 : 4
- c. 1 : 3 : 6
- d. 1 : 2 : 6

53. The standard size of a brick without mortar is:

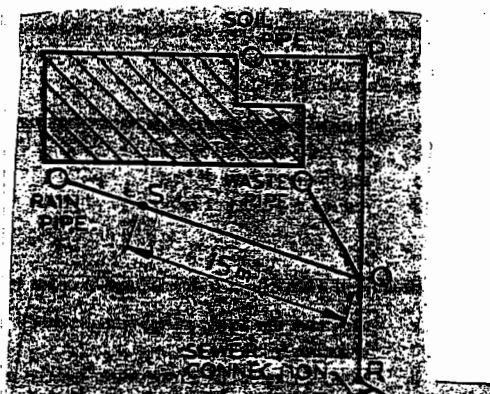
- a. 2255mm x 103mm x 75mm
- b. 215mm x 108mm x 65mm
- c. 215mm x 102.5mm x 65mm
- d. 460mm x 230mm x 230mm

54. In an architect's office, which of the following computer packages would you recommend for producing scaled drawings for on site use:

- a. CAM
- b. CAD
- c. Spreadsheet
- d. Lotus.

55. At which point would it be necessary to provide an inspection chamber on the drain in FIG 1 below:

- a. Q and R
- b. P, Q and R
- c. Q, R and S
- d. P and R



56. Drainage systems use rodding eyes instead of inspection chambers where possible due to:

- a. Physical size
- b. Ease of installation
- c. Cost
- d. Less interference to flow

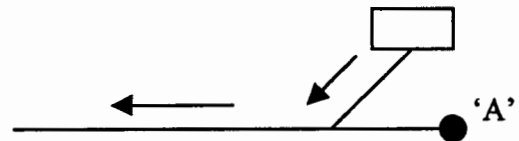


FIG 3

57. Which one of the following components of drainage systems should be used at point 'A' in Fig 3:

- a. An inspection chamber
- b. An interceptor
- c. A rodding point
- d. A vent

58. On the figure below, which arrow indicates a rise:

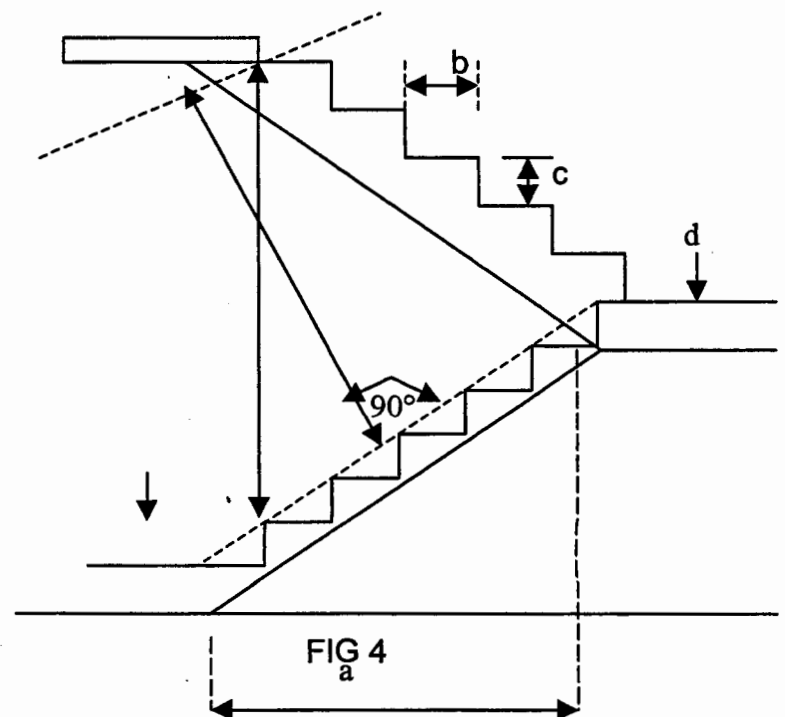


FIG 4

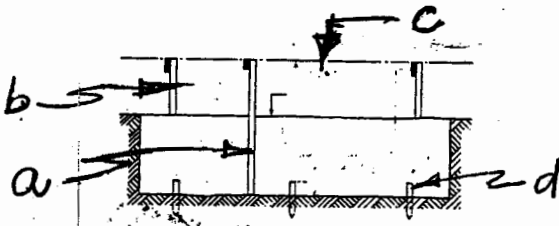
59. The minimum thickness of an oversite concrete should not be less than:
- 230mm thick
 - 200mm thick
 - 100mm thick
 - 150mm thick
60. The wall thickness and foundation widths when setting out a building are marked on:
- The ground floor
 - The concrete floor slab
 - The profile boards
 - The four stout pegs
61. Building regulations requires that vegetable topsoil be removed before the commencement of the building, in order to:
- Form a level base for the foundation
 - For ease carrying out the setting out of the building
 - For avoiding the growth of plants, shrubs and trees under the structure
 - For the formation of landscaping
62. The pitch for a pitched roof should be:
- A pitch from 0° to 20°
 - A pitch from 0° to 10°
 - A pitch not exceeding 10°
 - A pitch over 10°
63. On working drawings abbreviations are widely used. Which of the following abbreviations indicates a soil and vent pipe:
- S.A
 - S.A.P
 - S.A.V.P
 - S.V.P
64. Coping in wall construction refers to:
- A method of finishing's to a wall to prevent capillarity
 - Making parapet walls to be more attractive
 - A pre-cast unit used to provide a finishing on top of walls with a groove to shade off rainwater
 - A method of separating the rood and the wall
65. The term course in brick or block work construction means:
- The number of bricks or blocks in a line of bricks or blocks
 - The line of bricks or blocks in the height of a wall
 - The patter of laying the bricks or blocks
 - The number of lines of vertical and horizontal mortar joints
66. In wall construction, the term course rod means:
- A straightedge that we use to make the bricks or blocks straight in a wall
 - A tool used for leveling and plumbing the walling units
 - A spirit level
 - A straightedge that has the marked height of a brick or block plus its mortar joint
67. Which function would be used on a computer to indicate spelling errors:
- Spell check
 - Spell error

- c. Word check
d. Word error
68. Reasons for removing vegetable soil are:
- To avoid growth of plants, shrubs or trees
 - To have a firm base to cast concrete slab
 - To minimize dampness under floors
 - To act s dpc
69. The load of 320kN from a concrete column is supported by a pad foundation on soil having a bearing capacity of 80Kn/m². The size of the base should be a minimum equivalent of:
- 1m x 1m
 - 2m x 2m
 - 3m x 3m
 - 4m x 4m
70. The main reason for bonding brick or block walls is to:
- Maintain the straight vertical joints
 - Have a uniform mortar joint
 - Avoid straight vertical joints
 - Have a good external appearance
71. The basic objective of site investigation is:
- To collect systematically and record all necessary data which will be needed or help in the design and construction process of proposed works
 - To give reference points for setting out the proposed work
 - To obtain subsoil samples for identification,
- classification and ascertaining the subsoil characteristics
- d. To determine the suitability of the site for the proposed project
72. The term environment can be best defined as:
- Surroundings which are created by man with or without the aid of the natural environment
 - Surroundings which can be natural, man-made or a combination of these
 - Canals, rivers, dams, etc. which surrounds us
 - Trees, mountains, rocks, etc. which surrounds us
73. Building regulations can be defined as:
- A statutory instrument made under the Factories Act
 - A non-statutory publication supporting Building Regulations
 - A statutory instrument which sets out the minimum performance standards for design of buildings and where applicable to the extension of buildings
 - An approved document for structure, fire safety, toxic substances, ventilations etc.
74. In roofing, the carpenter has to form a birds mouth joint at:
- Purlin and rafter fixing
 - Kingpost and Purlin Fixing
 - Wall Plate and rafter fixing
 - Tie beam and rafter fixing

75. Steel bars are placed 25mm or 40mm from the bottom of a lintel in order to:

- a. Promote the rate of corrosion
- b. Promote the spread of fire
- c. To give protection against corrosion and the spread of fire
- d. To make the lintel more durable

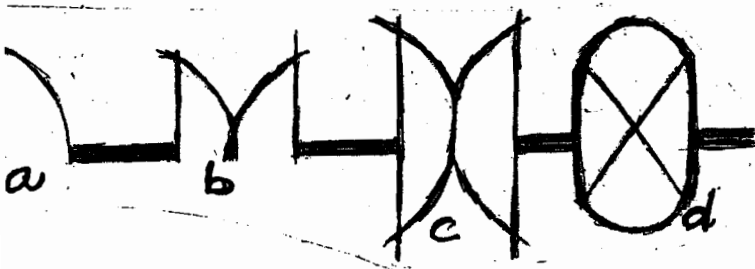
76. On the sketch below for a drainage system which arrow indicates a traveler:



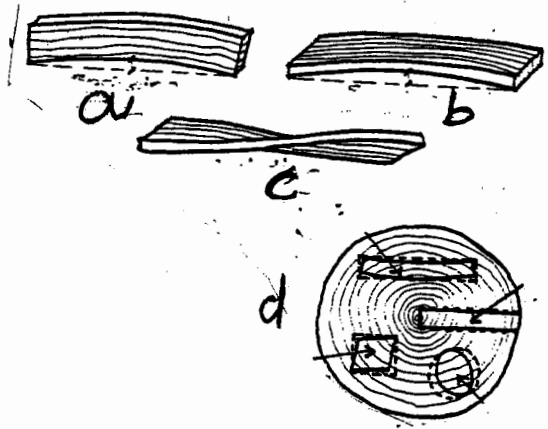
77. Which is the recommended gauged mortar mix for the internal walls:

- a. 1 : 1 : 1
- b. 1 : 1 : 6
- c. 1 : 2 : 9
- d. 1 : 1 : 9

78. Which of the following illustrates a revolving door:



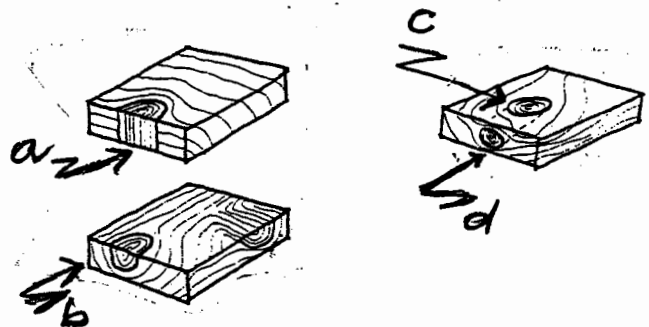
79. Which of the following sketches illustrates a seasoning defect known as a Bowing:



80. Which of the following works indicates an outline on a drawing:

- a. _____
- b. _____
- c. _____
- d. _____

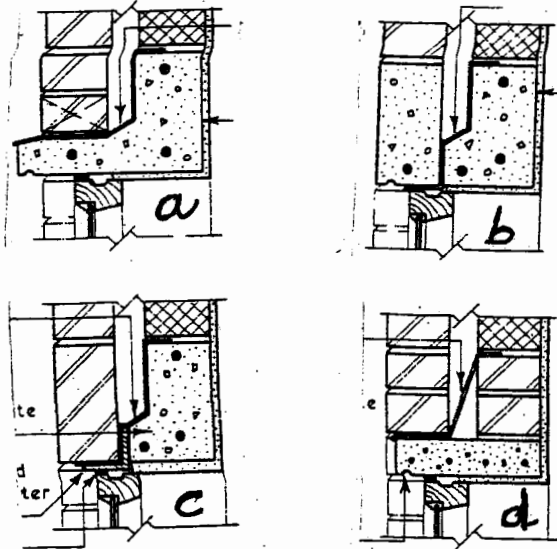
81. Which arrow in the sketch below illustrates a margin knot:



82. Which of the following symbols represent a reinforced concrete:

- a.
- b.
- c.
- d.

83. Which of the following sketches below indicates a cavity wall with a boot lintel:



84. Column 'C' on the dimension paper is known as:

	A	B	C	D	A	B	C

- a. Timesing column
- b. Squaring column
- c. Description column
- d. Dimension column

85. A system of gathering together similar items in taking-off is:

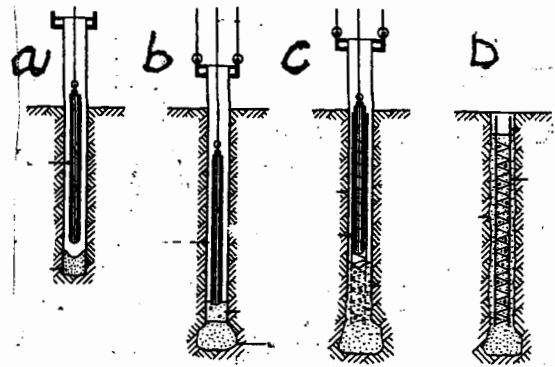
- a. Multiplication
- b. Abstracting
- c. Working-up
- d. Dotting-on

$\begin{matrix} 5 \\ 2 \\ 3 \end{matrix}$	4.50		
	3.50		
	2.00		

86. The squaring of the above taking-off on the dimension paper is:

- a. 945.00
- b. 350.00
- c. 94.50
- d. 94.50

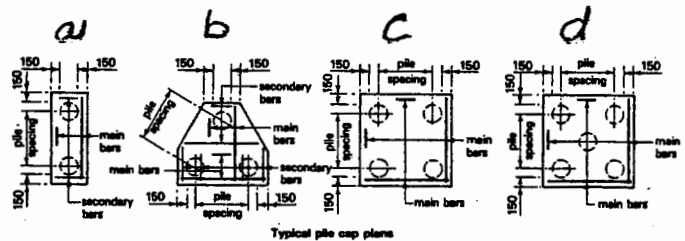
87. Below is a FRANKI driven in situ piles, which sketch illustrates completed FRANKI driven in situ pile:



88. In which stage of the piles in the above question is an enlarged toe base formed:

- a. 945.00
- b. 31.50
- c. 315.00
- d. 94.50

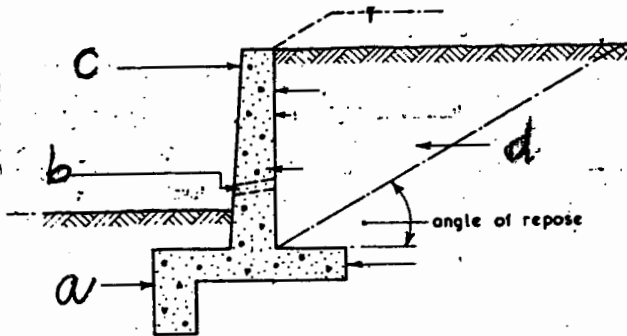
89. Which of the typical pile cap plans illustrates a Pile Cap with three piles:



90. To reduce hydrostatic pressure on retaining walls, which of the following should be incorporated:

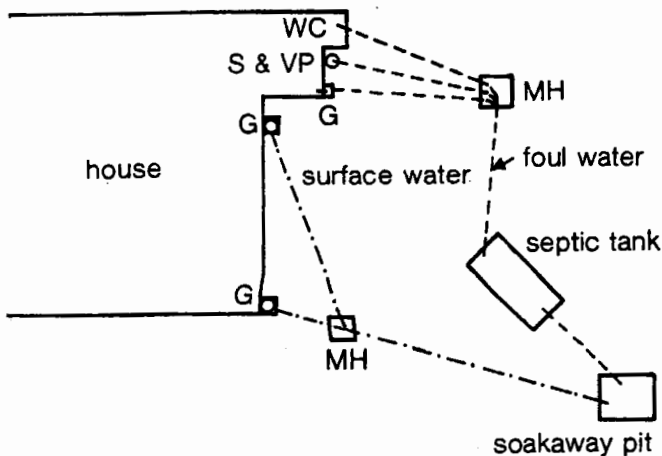
- a. Facing bricks
- b. Half round channel
- c. 200mm wide "No-fines" granular backfill
- d. 75mm diameter sleeved weep holes at 2m centre to centre

91. The sketch below illustrates a retaining wall, which arrow indicates a "toe":



92. The drainage in the figure below would be termed:

- a. Partially separate
- b. Separate
- c. Combined
- d. Mixed



93. The area of brickwork is 30 metre squared. The size of a brick with mortar is 225 mm x 102.5 mm x 75mm. How many brick are to be ordered, allowing 5% for cutting and waste

- a. 9000
- b. 1854
- c. 1765
- d. 1200

94. Which drafting aid can be used for drawing circles, ellipses, hexagons etc:

- a. French curve
- b. Flexible curve
- c. Template
- d. Railway curve

95. The basic objective of sub soil investigation is:

- a. To collect systematic and record all necessary data which will be needed or help in the design and construction process of the proposed works
- b. To give reference points for setting out the proposed work
- c. To obtain subsoil samples for identification, classification and ascertaining the subsoil characteristics
- d. To determine the suitability of the size for the proposed project

96. Bulking of soil is the term applied to:

- a. An increase in the volume of soil during the excavation and when subjected to rain

- b. *The natural binding* together of the soil particles
 - c. *The storage of coarse aggregate in a heap*.
 - d. *The mixing of fine and coarse aggregate*
97. The North Point used on site plans, block plans and location drawings is to:
- a. Assist in the correct orientation of views
 - b. Assist in establishing the building line
 - c. Assist in establishing the centre of the road
 - d. Assist in establishing the boundaries of the site
98. Which bond is considered to be aesthetically superior:
- a. English bond
 - b. Stretcher bond
 - c. Flemish bond
 - d. English garden bond
99. Which statements best defines the term going in a staircase:
- a. The vertical distance between the top surfaces of two consecutive treads
 - b. The maginary line which touches all the nosings in a flight
 - c. The shaped front edge of a tread
 - d. The horizontal distance between the faces of consecutive risers or nosing
100. Common stairway rise must be:
- a. More than 190mm
 - b. Not more than 190mm
 - c. More than 220mm
 - d. Not more than 220mm