

සියලු ම හිමිකම් ඇවිරිණි / முழுப் பதிப்புரிமையுடையது / All Rights Reserved

ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව
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88 E I, II

අධ්‍යයන පොදු සහතික පත්‍ර (සාමාන්‍ය පෙළ) විභාගය, 2023(2024)
கல்விப் பொதுத் தராதரப் பத்திர (சாதாரண தர)ப் பரீட்சை, 2023(2024)
General Certificate of Education (Ord. Level) Examination, 2023(2024)

නිර්මාණකරණය හා ඉදිකිරීම් තාක්ෂණවේදය I, II
வடிவமைப்பும் நிர்மாணத் தொழினுட்பவியலும் I, II
Design and Construction Technology I, II

පැය තුනයි
மூன்று மணித்தியாலம்
Three hours

අමතර කියවීමේ කාලය - මිනිත්තු 10 යි
மேலதிக வாசிப்பு நேரம் - 10 நிமிடங்கள்
Additional Reading Time - 10 minutes

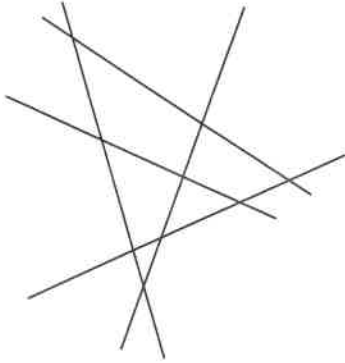
Use additional reading time to go through the question paper, select the questions and decide on the questions that you give priority in answering.

Design and Construction Technology I

Instructions:

- * Answer *all* questions.
- * In each of the questions 1 to 40, pick one of the alternatives (1), (2), (3), (4) which is correct or most appropriate.
- * Mark a cross (X) on the number corresponding to your choice in the answer sheet provided.
- * Further instructions are given on the back of the answer sheet. Follow them carefully.

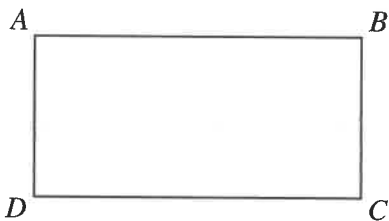
1.



The figure shows the arrangement of five ekels when they are dropped on to a table by accidentally. The geometrical shapes that can be seen on the figure are

- (1) triangles and squares.
- (2) squares and pentagons.
- (3) triangles and rectangles.
- (4) pentagons and hexagon.

2.



The geometrical shape that can draw to just touch the all four lines AB, BC, CD and DA of the given rectangle is

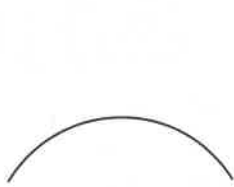
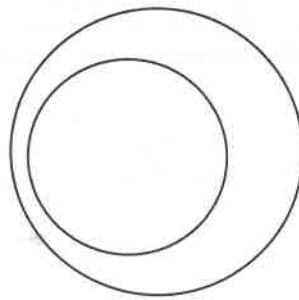
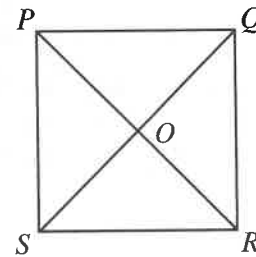
- (1) an isosceles triangle.
- (2) a scalene triangle.
- (3) a circle.
- (4) an ellipse.

3. What is the factor that unable to draw a circle when only one of the factor is given from the following?

- (1) Center
- (2) Radius
- (3) Diameter
- (4) Circumference

[see page two]

4. Three statements are given in relation to the figures L , M and N below.

 L  M  N

A – It is unable to find the center to draw arc L at all.

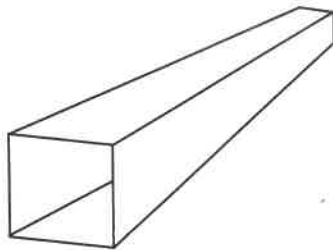
B – There are two separate centers for each two circles at figure M .

C – O should be used as the center to draw a circle which just touches the points of $PQRS$ square in figure N .

The correct statements are

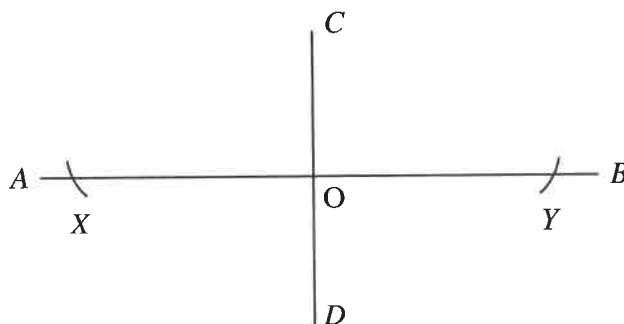
- | | |
|-------------------|---------------------|
| (1) A and B only. | (2) A and C only. |
| (3) B and C only. | (4) all A, B and C. |

5. What is the method used to draw the following figure?



- (1) Orthographic projection method
- (2) Isometric projection method
- (3) Perspective method
- (4) Non standard method

6. In the following figure, $AO = OB$ and $CO = OD$.



Initially the lines and points are marked to construct an ellipse on it and the distance between points X and Y is

- | | |
|-----------------------------------|---------------------------|
| (1) length of major axis. | (2) length of minor axis. |
| (3) distance between two focuses. | (4) length of guide axis. |

7. Consider the following statements.

A – The angle between a tangent and a radius drawn to the tangent point is 90° .

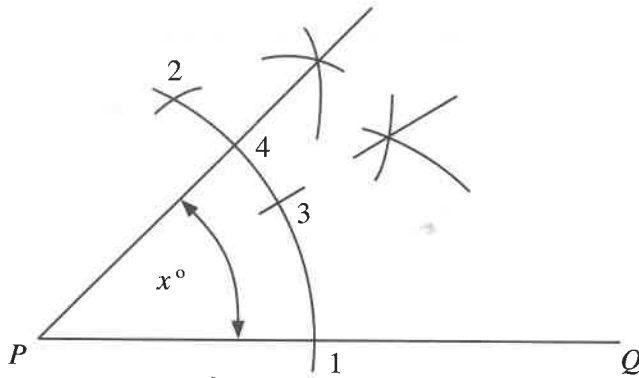
B – The scale fraction is always stated as a ratio of small measurement to a large scale.

C – Only two adjacent units which belonging to a same species can be used in simple measurement.

Out of the above, the correct statements are

- | | |
|-------------------|---------------------|
| (1) A and B only. | (2) A and C only. |
| (3) B and C only. | (4) all A, B and C. |

8. The following figure shows a construction of an angle using only the compass, ruler and pencil.



The value of x° is

- (1) 15° . (2) 30° . (3) 45° . (4) 60° .
9. Which of the following is a physical property of a material?
 (1) Melting point (2) Specific heat (3) Density (4) Boiling point

10.



The above figure shows an steel coil where a 'F' force is applied from both ends. The reaction formed in the coil is

- (1) a tensile strength. (2) a compressive strength.
 (3) a deformation. (4) a plasticity.
11. The brittleness of a material is known as
 (1) cracking it by applying an external force.
 (2) the ability to pull or bend a material without breaking or cracking.
 (3) melting a material by supplying heat.
 (4) breaking a wire by pulling from both ends.
12. What is the equation use to measure the dampness of a natural timber?
 W_1 = Weight of damp timber W_2 = Weight of dry timber
 (1) $\frac{W_1 - W_2}{W_2} \times 100$ (2) $\frac{W_2 - W_1}{W_2} \times 100$ (3) $\frac{W_2 - W_1}{W_1} \times 100$ (4) $\frac{W_1 - W_2}{W_1} \times 100$
13. The approximate weight of a brick made according to the SLS 39 standard is
 (1) 1 kg. (2) 3.2 kg. (3) 5 kg. (4) 7 kg.
14. Out of the below what is the size of sieve that sieving the fine aggregate used for construction tasks?
 (1) 4 mm (2) 4.5 mm (3) 4.8 mm (4) 5 mm
15. Followings are few technical facts often used in the construction field.
 A – Standard of aggregate
 B – Mix proportion
 C – The quantity of water added
 D – Compaction

The fact/facts that effect/s on making a quality concrete mixture from the above is/are

- (1) A only. (2) B only.
 (3) A, B and C only. (4) all A, B, C and D.

16. Bendability and resisting to the vibration are characteristics of a natural timber. What is the timber product that produced by using these characteristics?
- (1) Window frame (2) Handle of a sludge hammer
(3) Door sash (4) Photo frame
17. What is a characteristic of a dicotyledonous tree?
- (1) No branches (2) It has a tap-root
(3) the trunk grows from inside (4) Parallel veins on leaves
18. Large outgrowth roots at the bottom of tree trunk is a timber defect. What is this defect?
- (1) Cross grain (2) Crack (3) Spike (4) Buttress
19. What is the defect occurred due to the errors on storing and seasoning of timber?
- (1) Knot (2) Rot (3) Sapwood (4) Twist
20. Select the statement that contain the only methods of timber seasoning among following statements.
- (1) Air seasoning, Painting with oil, Mechanical seasoning
(2) Air seasoning, Mechanical seasoning, Soak in oil
(3) Air seasoning, Mechanical seasoning, Mix seasoning
(4) Soak in oil, Air seasoning, Smoking
21. What is the non traditional method used for timber preservation?
- (1) Laying in mud (2) Painting with chemicals
(3) Burning (4) Fomentation in fire
22. What are the measurements of a queen closer made out from a brick which has produced according to SLS standards?
- (1) $220 \times \frac{105}{2} \times 65$ mm (2) $220 \times 105 \times 65$ mm
(3) $110 \times 105 \times 65$ mm (4) $215 \times \frac{105}{2} \times 65$ mm
23. What should be the composition of sand in clay to produce a high quality clay brick?
- (1) 10% – 20% (2) 15% – 25% (3) 20% – 30% (4) 30% – 40%
24. 1:3:6 (40) concrete mix is used for
- (1) lintels. (2) water storing tanks.
(3) floors. (4) heavy weight concretes.
25. Gauge rod is used for
- (1) to check the horizontality of a brick wall.
(2) to check the verticality of a brick wall.
(3) to check the height of brick courses.
(4) to measure the length of the wall.
26. The tool which is going out of usage is
- (1) smoothing plane. (2) claw hammer. (3) square. (4) brace and bits.
27. What is the answer that states length, width and height of a measuring box that used for measuring cement in a construction site?
- (1) $200 \times 250 \times 350$ mm (2) $400 \times 350 \times 250$ mm
(3) $400 \times 350 \times 290$ mm (4) $500 \times 400 \times 300$ mm
28. Cutting angle of a snip is
- (1) 60°. (2) 87°. (3) 90°. (4) 118°.

29. The efficiency of power tools is measured in Watts or horsepower. 1 horsepower is
(1) 700 W. (2) 746.5 W. (3) 750 W. (4) 800 W.
30. The RPM of a power tool describes
(1) the number of rotates per minute. (2) the number of rotates per seconds.
(3) the number of rotates per $\frac{1}{2}$ a minute. (4) the number of rotates per hour.
31. The most suitable joint to make a photo frame is
(1) tenon joint. (2) mitre joint.
(3) housed/housing joint. (4) halving joint.
32. What is the answer that correctly shows the materials of 1:2:6 lime cement mortar respectively?
(1) Lime, cement, sand (2) Sand, cement, lime
(3) Cement, lime, sand (4) Cement, metal, sand
33. Span of an arch is
(1) the external curve of the arch.
(2) the internal curve of the arch.
(3) the distance between external walls with number of arches.
(4) the distance between two supports of an arch.
34. Beveled reamer or alias pipe reamer is used for
(1) to prepare the cutting edge of a PVC pipe.
(2) to prepare the cutting edge of a GI pipe.
(3) to join threaded pipe.
(4) to cut a GI pipe.
35. A reduced socket is used in a water pipe system when
(1) joining two pipes with equal diameters.
(2) joining two pipes with different diameters.
(3) turning the pipe system by 90° .
(4) joining two or three pipes with another component.
36. The material **not** to be used when fixing taps and valves in PVC water supply system is
(1) glue. (2) solvent cement.
(3) thread seal. (4) socket.
37. What is the area of a plank with 200 mm width and 2 m length?
(1) 0.1 m^2 (2) 0.2 m^2 (3) 0.3 m^2 (4) 0.4 m^2
38. The persons achieved N.V.Q. – 4 certificate are qualified to be
(1) managers.
(2) planners.
(3) craftsman who can work independently.
(4) craftsman who has the basic and fundamental skills.
39. Unburnt bricks are
(1) inadequately burnt bricks. (2) over burnt bricks.
(3) bricks with plastic clay. (4) bricks with more sand.
40. When fixing a screw the drill bit required to drill a hole to drive the head of a screw is
(1) auger bit. (2) bit and brace.
(3) countersink bit. (4) twisted drill bit.

* *

[see page six]

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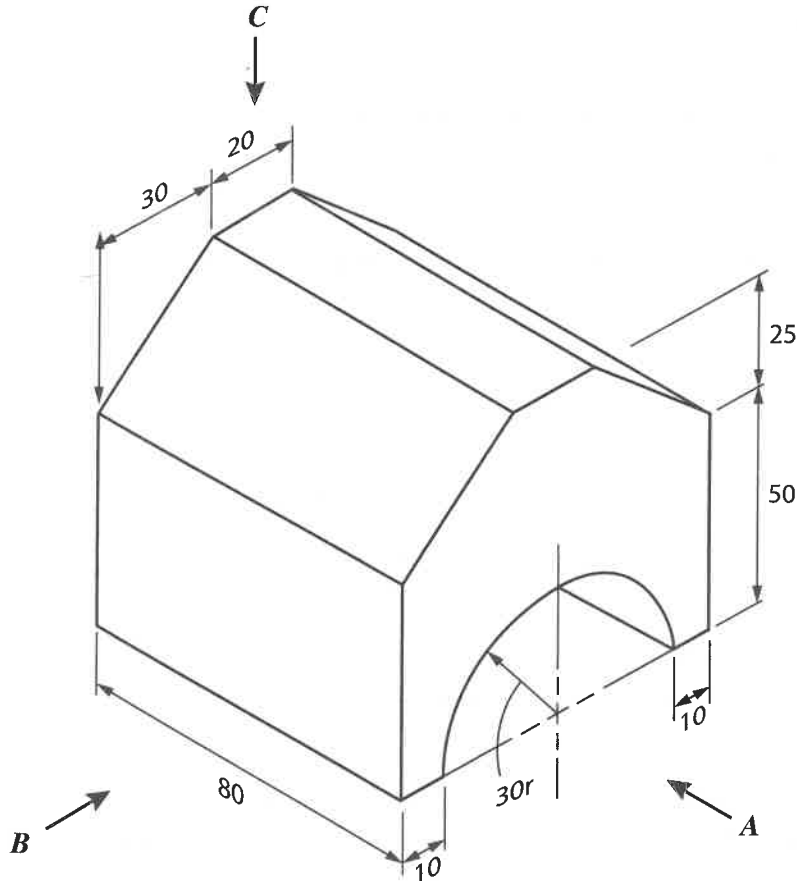
අධ්‍යයන පොදු සහතික පත්‍ර (සාමාන්‍ය පෙළ) විභාගය, 2023(2024)
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නිර්මාණකරණය හා ඉදිකිරීම් තාක්ෂණවේදය I, II
வடிவமைப்பும் நிருமாணத் தொழினுட்பவியலும் I, II
Design and Construction Technology I, II

Design and Construction Technology II

- * Answer **five** questions including the **first** question and **four** other selected questions.
- * Question No.1 carries **20** marks and each of the other selected questions carry **10** marks each.

1. (i) Look at the isometric figure given below.
Draw following **A**, **B** and **C** views according to the third angle method of orthographic projection principle in full scale as per given measurements.
(all measurement are in millimeters)
Front elevation from arrow **A**
Side elevation from arrow **B**
Plan from arrow **C**



- (ii) Draw a scalene triangle with your own measurement and construct the circumscribed circle of the triangle. Indicate the measurements you used in each side of the triangle.

[see page seven]

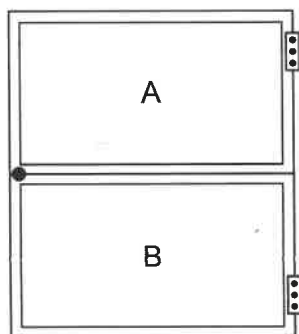
2. The residents are using a two storey house where only the ground floor is completed and concrete floor for the 1st floor is laid. It is observed that the water is penetrating through the 1st floor slab into the house.

- (i) Name **two** disadvantages situations which can be occurred.
- (ii) State **two** finishing methods that can be applied as masonry techniques on the 1st floor to avoid these disadvantages situations.
- (iii) Explain in brief **one** finishing method you mentioned in above (ii).

3. Burnt lime also used as a binding material in construction field.

- (i) Name **three** raw materials used to produce lime.
- (ii) Write the chemical reaction that occurs when burning limestones.
- (iii) State **one** safety precaution with the reason which should be applied in storing and transportation of burnt lime.

4. The following figure shows a door sash which made using an aluminium frame.



- (i) Name **two** materials that can be used for surface A and B shown on door sash.
- (ii) What is the material which can be used to keep surface A and B tightly and firmly in the aluminium frame?
- (iii) State **two** advantages and **two** disadvantages of using aluminium for doors, windows and partitions with compare to the timber.

5. The timber obtained by sawing tree logs are the mainly used raw materials for producing timber products.

- (i) Write **two** characteristics in natural timber.
- (ii) Write **two** characteristics of monocotyledon plant.
- (iii) Draw a cross section of a dicotyledonous tree trunk and mark the followings.
 - (a) Outer bark
 - (b) inner bark
 - (c) Heart wood
 - (d) Pith

6. It is required to make a dining table for the school Home Economics laboratory with 1 m width, 2 m length and 0.75 m height. The followings are the materials required.

- 4 pieces of timber with 75 mm × 75 mm cross section and 750 mm length for table legs.
- 02 planks with 25 mm thickness, 150 mm width and 1 m length for the frame.
- 02 planks with 25 mm thickness, 150 mm width and 2 m length for the frame.
- 05 pieces of timber planks with 25 mm thickness, 200 mm width and 2 m length for the table top.
- 3 pieces of timber planks with 25 mm thickness, 75 mm width and 1 m length for clamps to fix the table top.
- 200 g of 38 mm wire nails for fixing clamps

1 m of 75 mm × 75 mm timber is Rs. 400.00

1 m² of 25 mm thick timber planks is Rs. 500.00

Carpenter's payment to make the table is Rs. 10000.00

1 kg of 38 mm wire nails is Rs. 400.00

Calculate the total cost required for making table.

7. Write short notes with sketches for following tools.

- (i) Steel ruler
- (ii) Beveled square
- (iii) Mortice gauge
- (iv) Plumb bob
- (v) Measuring box

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