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கல்விப் பொதுத் தராதரப் பத்திர (சாதாரண தர)ப் பரீட்சை, 2017 டிசெம்பர்
General Certificate of Education (Ord. Level) Examination, December 2017

නිර්මාණකරණය හා තාක්ෂණවේදය	I, II
ஆக்கத்திறன் தொழினுட்பவியல்	I, II
Design and Technology	I, II

පැය තුනයි
மூன்று மணித்தியாலம்
Three hours

Design and Technology I**Note :**

- 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.

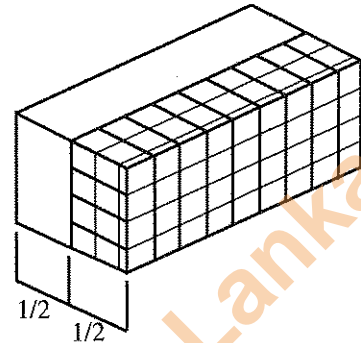
- If a Product is to be done for the identified problem, first
 - the plan should be drawn according to the geometrical principles.
 - sketches should be drawn pertaining to the presumed information.
 - materials should be collected after preparing the list of materials.
 - tools/equipment should be collected after preparing the list of tools.
- Several parts did not match, when assembling parts after making all parts according to a plan pertaining to a certain design. Several possible reasons are given below.
 - An error of measurements in the design drawing.
 - An error of the materials used to prepare parts.
 - Weakness of a person who does not know the sequence of the work.
 - An error of the measuring equipment used to prepare parts.
 The correct facts out of the above are
 - A and B.
 - B and C.
 - A and D.
 - B and D.
- If a more productive and developed product is to be done in the future, after finishing a product,
 - criticism should be obtained for the finished product.
 - reviews should be obtained for the finished product.
 - all designs pertaining to the finished product should be changed.
 - features of the finished product should be changed by using other craftsmen.
- When writing a report for the scientific method pertaining to the solution of an identified problem,
 - presenting information by drafted notes is adequate.
 - presenting information through drafted notes, tables and pictures are suitable.
 - it is suitable to write order of the process followed, when manufacturing the design product.
 - presenting the report by using a collection of pictures is adequate.
- An additional height was needed for a chair made to be used with a table meant for a small child who has a height fit for his age, to do his learning activities at home. The factor that had **not** been considered when making this furniture kit is
 - ergonomics.
 - height of the chair.
 - height of the table.
 - age of the child.
- Two strings are placed to cross each other and the ratio of the lengths of two strings from the intersection point is 3:4 respectively. The length from the end points of the above two strings is set as 5 to a ratio. The angle between two strings is
 - an acute angle.
 - a right angle.
 - a straight angle.
 - an obtuse angle.
- Several parts, equal in length need to be cut from a plank with 20 mm thick, 150 mm width and the length of 2 m. What are the minimum tools and equipment needed to do the above task, out of the tools and equipment needed?
 - Tape, Try square and Hand saw.
 - Tape, Pencil and Hand saw.
 - Try square, Pencil and Tennon saw.
 - Try square, rice and Panel saw.

8. Figure shows two overlapped planks prepared with drilling holes to be joined together. The above preparation is more suitable for fixing with



- (1) screwing.
- (2) bolting.
- (3) counter sink nailing.
- (4) rafter nails.

9. Figure shows two parts of an engineering brick cut along its centre line. One part of the brick can be identified as the

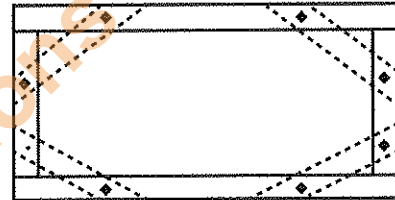


- (1) queen closer.
- (2) half bat.
- (3) king closer.
- (4) plinth stretcher.

10. Method of stopping an end of a wall with the objective of continuing it later is

- (1) racking back end method.
- (2) tothing end method.
- (3) stopped end preparation method.
- (4) stopped by using wedge method.

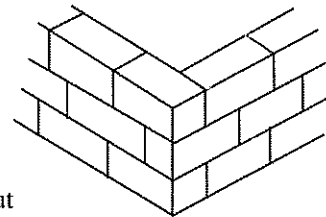
11. Figure shows the shape of the frame fabricated by reapers. It belongs to the type. To obtain the, segment of reapers are fixed to the four corners with slant.



Two words suitable to fill in the blanks in order in this description are

- (1) frame and beauty.
- (2) frame and stability.
- (3) structure and stability.
- (4) structure and beauty.

12. Figure shows three of brick in the brick wall to be bonded. It is a bond, according to the figure. Select suitable words to fill in the blanks in the given description.



- (1) bonds - stretcher.
- (2) bonds - english.
- (3) course - stretcher.
- (4) course - english.

13. A concrete is maintained with watering after laying the concrete without allowing the water to evaporate, for

- (1) curing the concrete.
- (2) compaction of the concrete.
- (3) reinforcement of the concrete.
- (4) confirming the shape of the shuttering.

14. There is an accepted method for writing ratios of the measuring quantity of materials used for preparation of the concrete. According to this method, ratio of the material can be written as

- (1) cement - fine aggregate - coarse aggregate.
- (2) cement - metal - sand.
- (3) bonding materials - fine aggregate - coarse aggregate.
- (4) coarse aggregate - fine aggregate - bonding materials.

15. A black part was seen in the plank obtained after sawing the trunk of a tree. When pressed, the black part got separated from the plank. This black part is a

- (1) dry rot.
- (2) knot.
- (3) live knot.
- (4) dead knot.

16. What is the commonly used finishing method for products with their surfaces made out of wood, metal and cement?

- (1) Polishing.
- (2) Galvanizing.
- (3) Painting.
- (4) Oxidizing.

17. Sharpen angle of a twist drill bit is

- (1) 90°.
- (2) 110°.
- (3) 116°.
- (4) 118°.

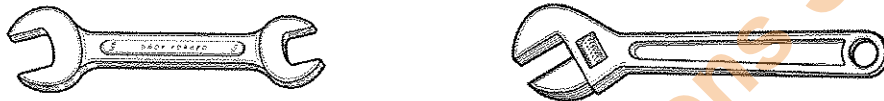
18. Tools sharpened only by using grinding wheel are

- (1) snip, planer blade, twist drill bit and centre punch.
- (2) snip, twist drill bit, chisel and centre punch.
- (3) snip, chisel, hand saw and scriber.
- (4) snip, centre punch, hand saw and chisel.






19. What material is transparent out of the following materials?
 (1) Acrylic (perspex). (2) P.V.C. (3) polyester resin. (4) Bakelite.
20. Most suitable method for jointing a gauge 18 brass sheets and an aluminium sheet is
 (1) soft soldering. (2) riveting. (3) flat lock seam. (4) electric arc welding.
21. What is the option that consists only of brittle metals?
 (1) Bronze, Mild steel, Cast iron. (2) Bronze, Led, Mild steel.
 (3) Bronze, Copper, Brass. (4) Bronze, Brass, Cast iron.
22. Gear wheel, rocker, cam shaft, push rod and timing gear wheel are some of the four stroke engine accessories. Function of these accessories in the engine is
 (1) providing rotational force of the crank shaft to other parts.
 (2) providing a spark from spark plugs at the correct time.
 (3) providing correct amount of petrol, air mixture to the cylinders.
 (4) opening and closing valves at correct time.

23. What place indicates the maximum temperature when the automobile engine is in operation?
 (1) engine - body. (2) engine - head. (3) piston. (4) radiator.

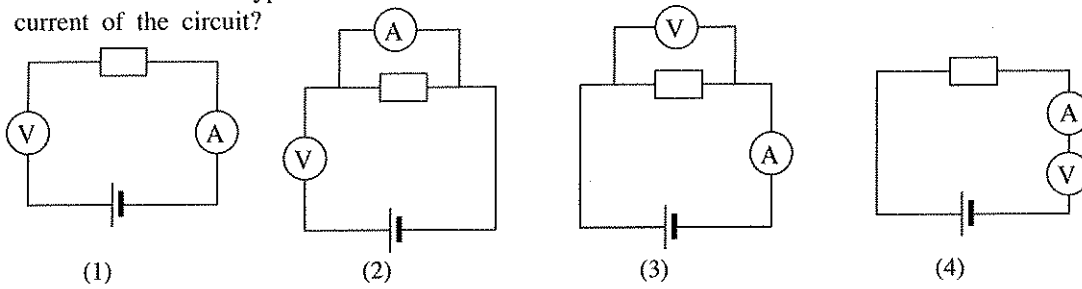
24. Figure shows two tools that are used in Automobile Technology,



They are

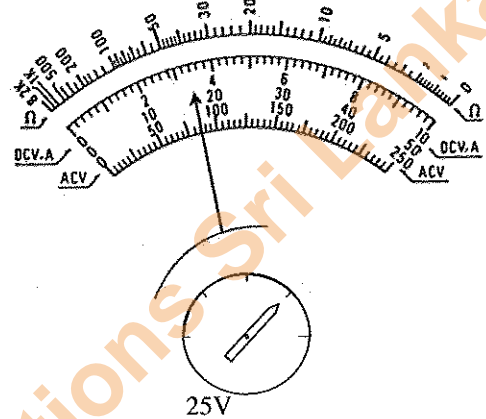
- (1) socket wrench and locking plier respectively.
 (2) ring spanner and common plier respectively.
 (3) double ended spanner and adjustable wrench respectively.
 (4) compound wrench and pipe wrench respectively.
25. Which answer indicates the plan view of this three dimensional solid object seen from direction-X shown with the arrow?

- (1)  (2)  (3)  (4) 
26. Angles that can be constructed by using only the pair of compasses and ruler of Geometrical Instrument Box are
 (1) 30°, 45°, 60°, 90° and 120°. (2) 26°, 30°, 45°, 60° and 90°.
 (3) 35°, 50°, 60°, 90° and 120°. (4) 40°, 60°, 90°, 120° and 180°.
27. An isometric view of an object is to be drawn. From what angle relative to the horizontal plane, are the lines showing height of the object drawn?
 (1) 30°. (2) 45°. (3) 60°. (4) 90°.
28. Angles that can be marked by only using two standard set squares in Geometrical Instrument Box are
 (1) 90°, 100°, 130°, 145° and 150°. (2) 80°, 90°, 140°, 160° and 180°.
 (3) 75°, 90°, 120°, 135° and 180°. (4) 90°, 105°, 120°, 130° and 160°.
29. In rubber industry, Tapping pain of a well grown rubber tree is marked with an inclination to the horizontal. What is that inclination to the horizontal?
 (1) 30° (2) 40° (3) 45° (4) 60°
30. Motion of the camshaft is provided to the valves
 (1) by the valve stem. (2) by the rocker arm. (3) by the pistons. (4) by the camshaft pulley.
31. The Mechanical property that helps to draw a metal as a thin wire is
 (1) malleability. (2) brittleness. (3) ductility. (4) plasticity.
32. Capacity of a capacitor of the Milar type capacitor is indicated as 474 by using a code. What is its capacity value?
 (1) 0.0047 μF (2) 0.047 μF (3) 0.47 μF (4) 47 μF
33. What is the value of a resistor with brown, black, brown, gold colour bands?
 (1) 10 Ω (2) 100 Ω (3) 1000 Ω (4) 10 000 Ω

34. What is the correct type of connection to connect an Ammeter and a Voltmeter to measure voltage and the current of the circuit?



35. The figure shows the face of a multimeter that measures voltage of a circuit. What is the value of the voltage it indicates?

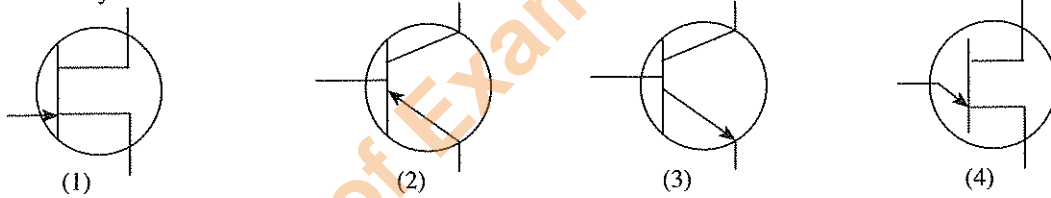
- (1) 2.7 V
- (2) 3.2 V
- (3) 8.5 V
- (4) 17 V



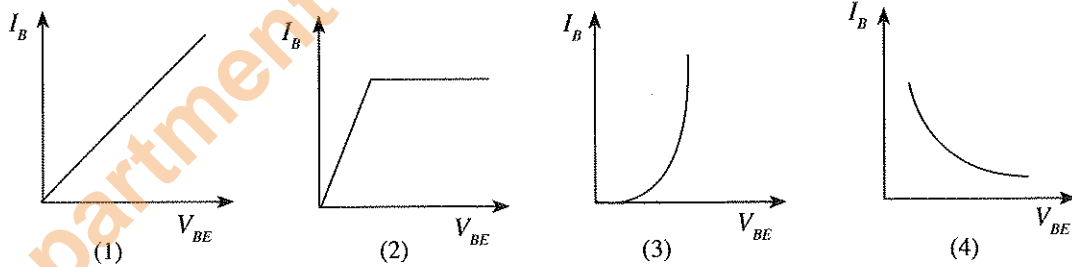
36. 12 mA current is needed to light a normal LED. Safety voltage for the LED is 2V. What is the value of resistance to be connected in series to light the same LED with 5 V safety voltage?

- (1) 1 Ω
- (2) 10 k Ω
- (3) 50 Ω
- (4) 250 Ω

37. What is the symbol of the NPN transistor?

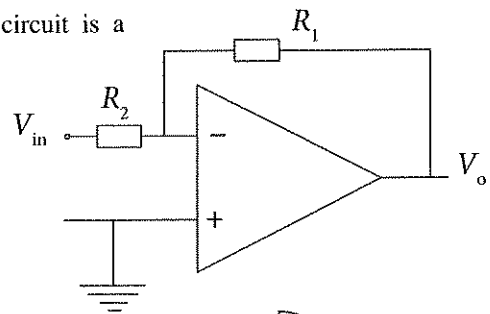


38. What is the correct curve that indicates the input characteristics of a transistor?

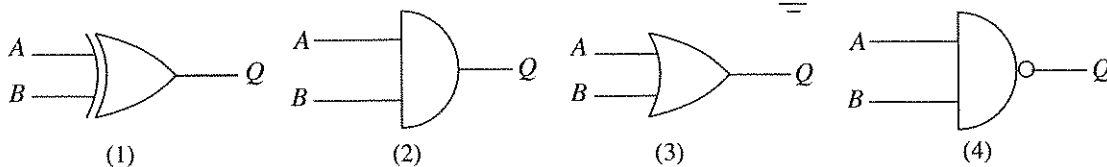


39. The figure shows a circuit with an operational amplifier. This circuit is a

- (1) comparator.
- (2) non inverting amplifier.
- (3) summing amplifier.
- (4) inverting amplifier.





40. What is the symbol of X-OR gate?



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පැරණි නිර්දේශය/பழைய பாடத்திட்டம்/Old Syllabus

ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව ශ්‍රී ලංකා විද්‍යාල විද්‍යාලීය පාලන කමිටුව ශ්‍රී ලංකා විභාග දෙපාර්තමේන්තුව ශ්‍රී ලංකා විද්‍යාල විද්‍යාලීය පාලන කමිටුව
 Department of Examinations, Sri Lanka இலங்கைப் பரீட்சைத் திணைக்களம் இலங்கைப் பரீட்சைத் திணைக்களம்
 Department of Examinations, Sri Lanka

අධ්‍යයන පොදු සහතික පත්‍ර (සාමාන්‍ය පෙළ) විභාගය, 2017 දෙසැම්බර්
 கல்விப் பொதுத் தராதரப் பத்திர (சாதாரண தர)ப் பரீட்சை, 2017 டிசெம்பர்
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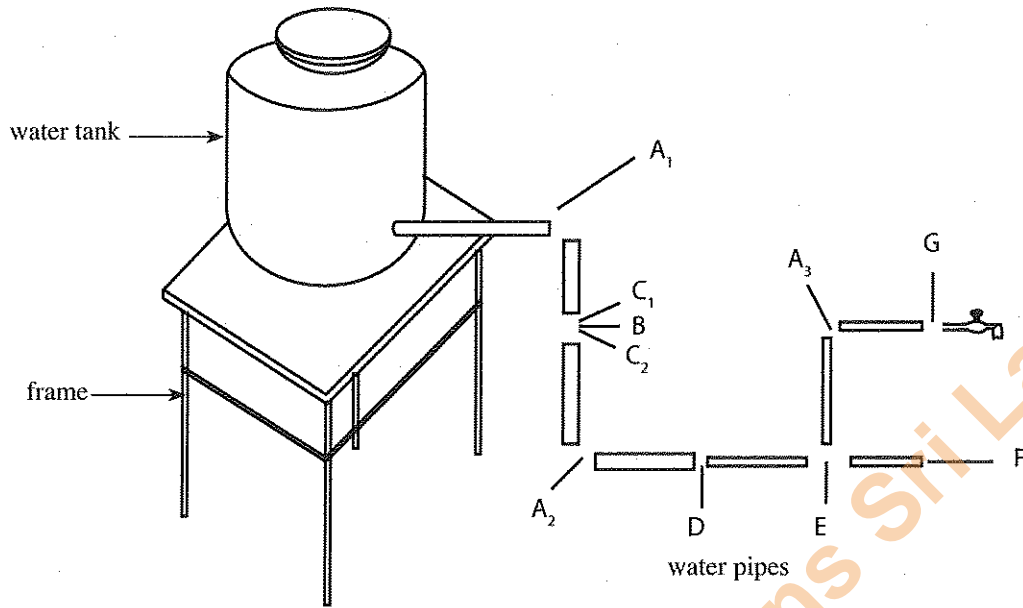
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ஆக்கத்திறன் தொழினுட்பவியல்	I, II
Design and Technology	I, II

Design and Technology II

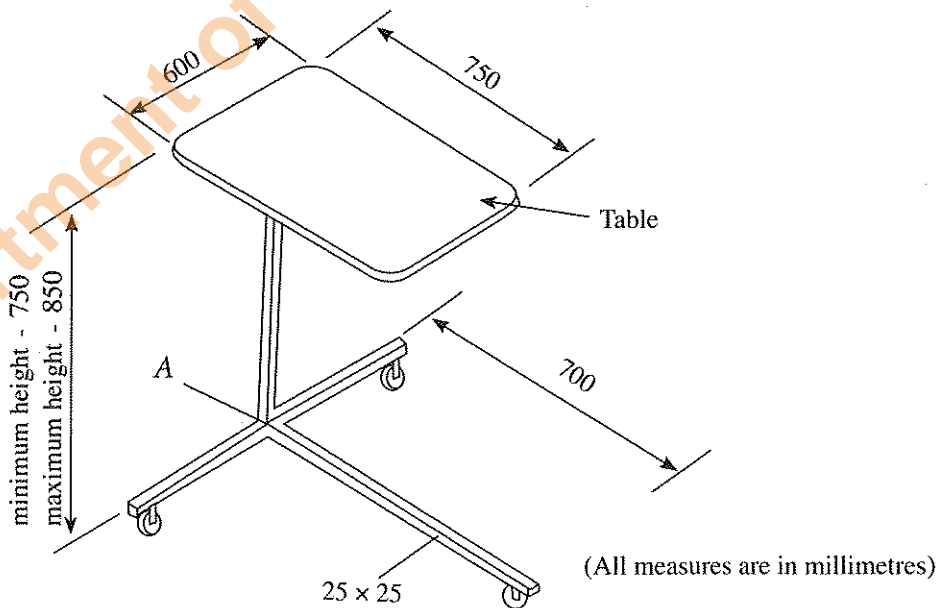
- * Answer five questions in all, selecting question No. 1 and four others.
- * Question No. 1 carries 20 marks, and other selected questions carry 10 marks each.

1. A village playground is situated in an isolated area devoid of any houses. It creates difficulties to the players during daytime, as there is no cover in the playground for protection from sun and rain. To avoid such situations and other environmental factors, players decided to build an attractive, small, semi-temporary, building.
- Assuming that you have got this proposal, answer the following questions so they can be used to make this task a success.
- (i) Write a design brief relevant to the solution of the above problem.
 - (ii) Draw a three dimensional view relevant to your proposed building.
 - (iii) Write **three** specifications that should be considered in constructing this building.
 - (iv) Write **four** materials/accessories needed to build this semi-temporary building according to your ideas.
 - (v) Mention **two** places that ergonomic features have to be used in designing this building.
 - (vi) Name **two** types of structures according to the places where they are situated in the building.
 - (vii) Indicating only the main features that are used to construct the building, prepare a rough estimate for the main features.
 - (viii) State the environmental factors that affect this building which is constructed in the playground.
 - (ix) Mention a decorative method that can be used for finishing this semi-temporary construction.
 - (x) State the maintenance work that should be performed when using it after finishing the construction of this semi-temporary building.

2. A rough sketch of a pipe laying diagram in a water supply system is shown below. The tank is to be installed 2.5 m above the earth level as a temporary water supply system for a short term need.



- (i) Considering the properties of a structure, write **three** weaknesses that could be found on the frame that has been built on the earth and the hazards that could occur as a result.
 - (ii) Name suitable accessories from letter A₁ to G for the temporary water supply system given in the figure.
 - (iii) Draw a rough sketch of a side of the proposed frame, avoiding weaknesses of the frame given in the figure.
 - (iv) Compare under **two** factors a water supply system and a water bound waste system.
3. The Trolley shown in the figure is used for a patient for taking food or to keep required goods. The trolley is made out of 25 mm × 25 mm mild steel tubes and castor wheels have been fixed for moving back and forth easily. Height of the table should be adjustable within the range of 750 mm - 850 mm.



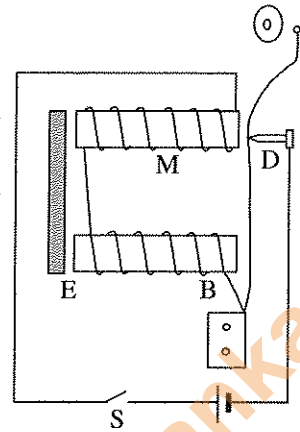
- (i) State the steps that should be followed to make this trolley, according to the given dimensions.
- (ii) Explain the device that can be used to adjust the height of the table.
- (iii) Draw a diagram to explain the modification methods you suggest for avoiding the goods falling off from the table.
- (iv) Name the most suitable joining method to join tubes at A.

[see page seven

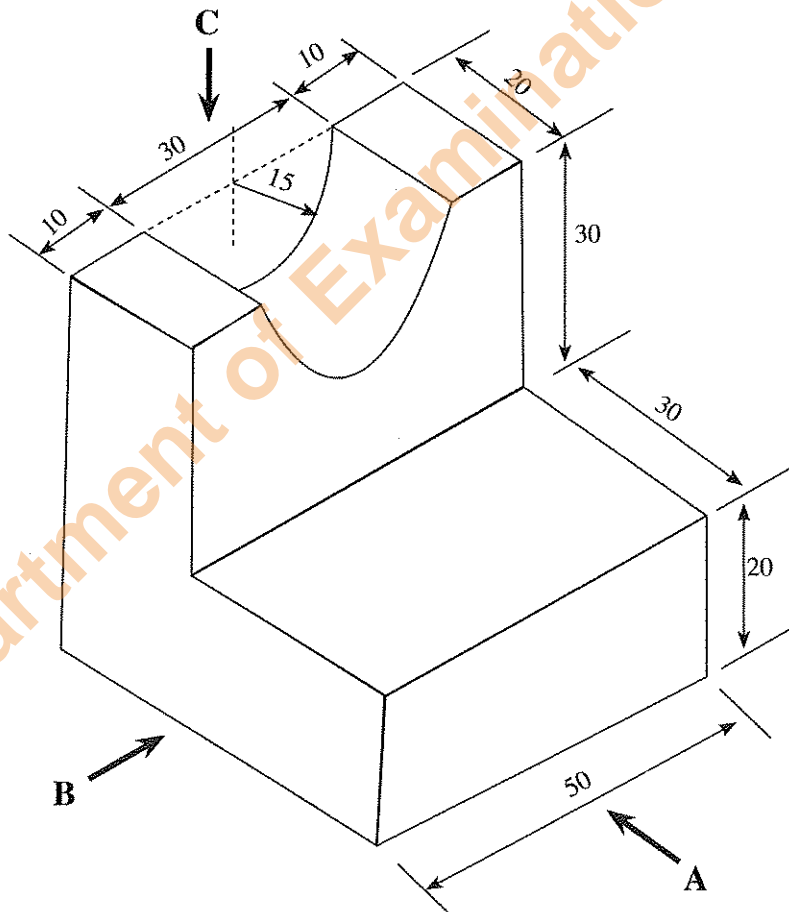
Department of Examinations Sri Lanka

4. The figure shows an electric bell, that works with direct current supply.

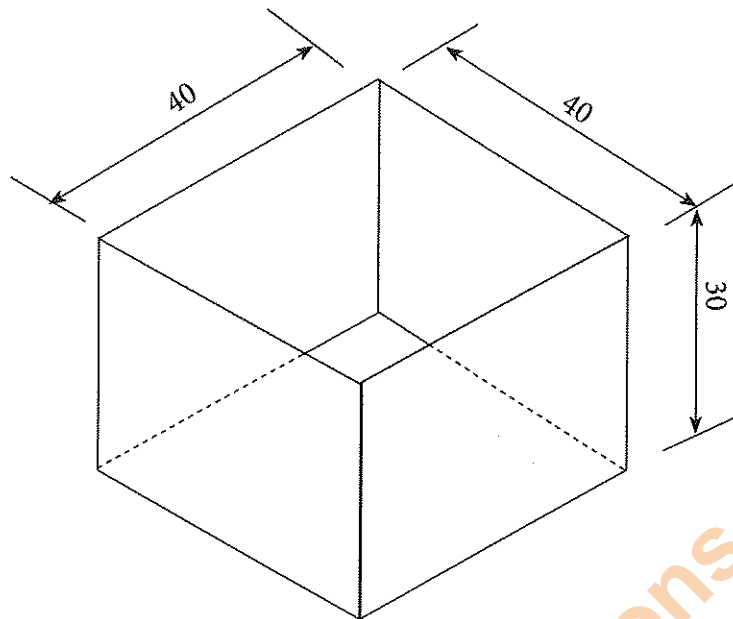
- (i) What is the point that receives continuous sparks in this circuit?
- (ii) What are the two places to join the battery to ring the bell only once when the 'S' switch is operated?
- (iii) Intensity of ringing bell will decrease if the soft iron E is removed. Write the reason for this.
- (iv) Is the direction of two wounded coils of the electro magnet correct? If it is wrong, draw the correct one.



5. (i) The diagram shows in figure is an isometric drawing and its dimensions are in millimetres. Draw
- (a) the front elevation from direction A.
 - (b) the side elevation from the direction B.
 - (c) the plan from the direction C,
- according to the 'third angle' method of orthographic projection. (All measures are in millimetres)



- (ii) Draw, with minimum joints, the 'shape of the development' to be used to make the box without the lid given in the figure, by using thin metal sheets. Indicate folding lines with dashed thin lines. (All measures are in millimetres)



6. Fixing of grills with different patterns made out of mild steel rods and flat irons are fixed to window frames for safety and beauty.
- Design an attractive grill pattern with geometrical shapes for a 75 cm × 160 cm rectangular shaped window frame.
 - Prepare an estimate of the materials needed for making the above grill pattern.
 - Name **four** tools and equipment that are used to make and finish the grill pattern.
 - Mention in steps, the process that is followed for finishing after making the grill pattern.
7. Various mediums are used to build walls when constructing a building.
- Write **two** objectives of building walls when constructing a building.
 - Explain the need of the mortar when building walls with bricks. Draw a diagram to show how the bricks are laid for downward force to be distributed parallelly.
 - Name tools and equipment needed for building walls and write functions of **two** of them.
 - Write steps of plastering a wall in sequence.

* * *