|   |            | TINGHED IN   |                                | 4                |
|---|------------|--|--------------------------------|------------------|
| <i>සියලු ම</i><br>முழுப் ப<br><i>All Rights</i> | திப்புரிரை | omormail   | Question<br>No.                | Marks<br>Awarded |
| ලී ලංක  | තා විභාග   | മുട്ടാഗ്മാමේන්තුව / இலங்கைப் பரீட்சைத் திணைக்களம் / Department<br>of Examinations, Sri Lanka   | 3 4                            |                  |
| -   | aminati    | National Botanic Gardens - Open /Limited Competitive on for Recruitment to Posts in the Grade III of the Lanka Technological Service - 2017 (2018) | 5 <b>Total</b> Marking Examine | er:              |
|   |            | (04) Subject related Knowledge<br>(Technical officer - Civil)  | Checked by:                    | ree hours        |
| Ans   | wer all    | questions on this paper itself. Index  | No :                           | ******           |
| <b>1.</b> (i                                    | ) Draw     | the symbols of the following items used on plan drawing, again   | st each of th                  | em.              |
|   | (a)        | Existing tree –  |                                |                  |
|   | (b)        | Water storage tank –   |                                |                  |
| (ii   | ) Name     | two areas in Sri Lanka, where crystallic lime stones are obtaine   | d in manufac                   | cturing lime     |
|   | (a)        |  |                                |                  |
|   | (b)        |  |                                |                  |
| (iii  |            | two types of admixtures used in modification the properties of c   |                                |                  |
|   | (a)<br>(b) |  |                                |                  |
| (iv   | ·          | the place/s which is/are needed to be reinforced in the following  |                                | embers.          |
|   | 1          | , p  |                                | :                |
|   |            | din din  | ninn                           |                  |
|   |            |  |                                |                  |
|   | -          |  |                                |                  |
|   |            |  |                                |                  |
| (v)   |            | two defects that can be occurred when taking levels.   |                                |                  |
|   | (a)<br>(b) |  |                                |                  |
| :<br>(vi  | ` ,        | is the name for lines used in checking the accuracy of chain su  |                                |                  |

|    | (vii)       | What is the name and the thickness of the metal sheet used to connect angle iron members in assembling mild steel roof truss, which are used very frequently at present.                                |
|----|-------------|---|
|    |             | Thickness:  |
|    |             | Name :  |
|    | (viii)      | What are the four colours used in sign boards displayed in construction sites?  |
|    | ( , 1117 )  |   |
|    |             | (a)(b)  |
|    |             | (c)(d)  |
|    | (ix).       | What is the term used to, identify the inner curve of a Semi-circular Arch constructed with Bricks?   |
|    | (x)         | What is the name of the pipe accessory which is used to change the direction in 90° and for smooth flow of water?   |
|    |             | (02×10=20 marks)  |
| 2. |             | Pad foundation are to be used in a proposed quarters for Department of Botanical Gardens. Considering the following data, draw a cross section of a Pad foundation on the graph paper provided.         |
|    |             | Scale - one small square - 50 mm  Data  |
|    |             | Length/width of the pad - 1400 mm SQ  |
|    |             | Height of the pad - 300 mm  |
|    |             | Cross-section of the pad - 300×300 mm   |
|    |             | Reinforcement details   |
|    |             | column foundation pad - 7Y16 - 201 - 200 BW   |
|    |             | column - 4Y 12-202  |
|    |             | stirrups - Y6-203 - 150   |
|    |             | concrete cover - 100 mm   |
|    |             | concrete mix - 1:2:4 (20 mm)  |
|    |             | Lean concrete blinding - 100 mm   |
|    |             | Depth of excavation - 1000 mm   |
|    |             | (Draw the column at least 600 mm above the ground level)  |
|    | <b>4:17</b> | (06 marks)  |
|    |             | Draw a centre-line diagram of a Mild steel roof truss, suitable for a span of 12.0 m, to be used in an Auditorium of the Department of Botanic Gardens and mark four important members with dimensions. |
|    |             | Covering materials - corrugated Eco-shell sheets  |
|    |             | Slope - 30° to the horizontal   |
|    |             | (Use the graph paper provided.  |
|    |             | Scale - one small square - 200 mm)  |
|    |             | (06 marks)  |
|    |             |   |
|    |             |   |

Department of National Botanic Gardens - Open / Limited Competitive Examination for Recruitment to Posts in the Grade III of the Sri Lanka Technological Service - 2017(2018)

(04) Subject Related Knowledge (Technical officer - Civil) TO BE PUBLISHED IN
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| (iii) State the types of sanitary fixtures used in toilet/urinal and bathroom systems with example and select the fixtures that you are going to use in a unit for a Botanic garden. |
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| **************************************   |
|  |
| (04 marks  |
| (iv) Select any four symbols shown in the figure, furnished and state their types, colours and writ a sentence each on what they are meant for.   A  B  C  D                         |
| E  |

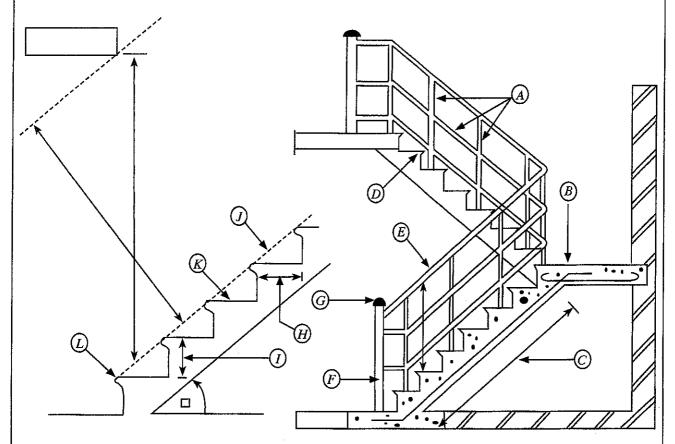
| Letter | Type of sign | Colour | meaning |
|--------|--------------|--------|---------|
| A      |              |        |         |
| В      |              |        |         |
| C      |              |        |         |
| D      |              |        |         |
| E      |              |        |         |
| F      |              |        | 74      |

(04 marks)

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3. (i) The cross-sections of a concrete stair is shown below. Note any ten members from (A) to (L) marked on it with arrows, in the table given below.





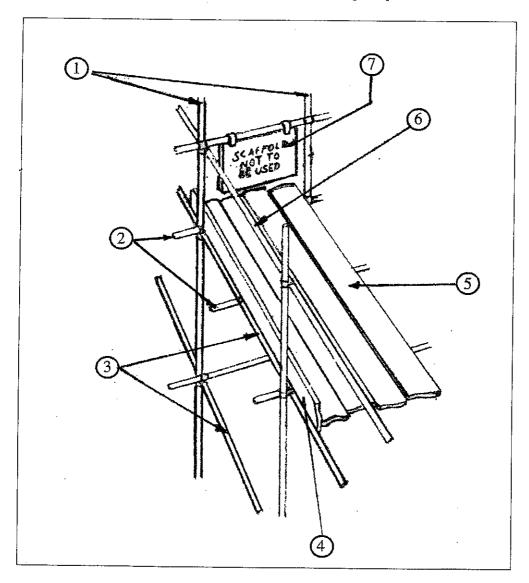
| A |   | G        |
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| С |   | <i>I</i> |
| D |   |          |
| Е | 1 | K        |
| F |   | L .      |

(05 marks)

| (11) | laboratory to determine the workability of less workable concrete and explain how it is performed.   |
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| •    |  |
|      | (06 marks)   |
|      | Name the type of pipe used for hot water supply and state six specific characteristics of them.  |
|      | Name of the type of pipe:  |
|      | Specific characteristics.  |
|      | (a)(b)   |
|      | (b)  |
|      | (d)  |
|      | (e)  |
|      | (f)  |
| (iv) | (04 marks)   |
|      | Painting has to be done on timber garden benches, which are desired to be located under trees of the childrens' park which is under construction. Line-up ten important points that you should consider in selecting a suitable paint.   |
|      | (a)  |
|      | (b)  |
|      | (c)  |
|      | (d)  |
|      | (e)  |
|      | the state of the s |

| -             | (f)   | • • • • • • •   |
|---------------|---|-----------------|
|               | (g)   |                 |
|               | (h)   |                 |
|               | (i)   |                 |
|               | (j)(05 m  |                 |
| <b>4.</b> (i) | State the reduced levels at points $A$ , $B$ and $C$ in metres.   |                 |
|               | 1.73 m 1.20 m 1.50 m 1.65 m   |                 |
|               | Reduced level 100.0 m   |                 |
|               | Not to scale  B   |                 |
| Redu          | ced level:  |                 |
|               | A:  |                 |
|               | B:  |                 |
|               | C:  | arks)           |
| (ii)          | It is stated that a 30 m long metal tape has to be used at 25 °C, but it was used at 35 If the linear co-efficient of expansion is 0.000 0035 °C <sup>-1</sup> , Calculate the refined reading or related steel tape. | 5 °C.<br>If the |
|               |   |                 |
|               |   |                 |
|               |   |                 |
|               |   | • • • • • •     |
|               | (04 m   | <br>arks)       |
|               | · ·   | ,               |

(iii) The picture shows a sketch of an isometric view of a scaffolding erected at a site. Name any **five** elements, against their numbers at the space provided.



| 1   |  |
|-----|--|
| 2   |  |
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| 4   |  |
| (5) |  |
| 6   |  |
| 7   |  |

(05 marks)

(iv) Calculate the reactions R<sub>1</sub> & R<sub>2</sub> and draw the Shear Force and Bending Moment Diag (Scale - small square = 250 mm and 250 newtons)

|                 | (Sca.  |  | man se  | 1   |                    | min a   | nu 250           |  | Ollay                             |  |  |  |  |   |  |
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|                 | 1 2 n  | n <b>B</b>                                       | 2 m -   | <b>V</b> 2  | m - D              | 1.5 m   |                  |  | - 1 - 1 - 1 - 1                   |  | Loading Diag   | ram  |  |   |  |
| - A             | <b>Y</b> <del>T</del> '                          | <u> </u>   |   | <u> </u>  | 111 A              | 1.0 111   | $\boldsymbol{E}$ |  |                                   |  |  |  |  |   | . 1 1  |
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|                 |  | R.   |   |   | ŀ. Ř               |   |                  |  |                                   |  |  |  |  |   |  |
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|                 |  |  |   |   |                    |   |                  |  |                                   |  |  |  |  |   |  |

(07 marks)

| 5. | By using the following data, calculate the unit rate of 1m <sup>3</sup> of the proposed Staff quarters, that belongs to the Departr  | of Reinforced Cement Concrete foundation<br>ment of Botanic Gardens. |
|----|--|--|
|    | Specifications   |  |
|    | Concrete mix   | 1:2:4 (20 mm) C= 20  |
|    | Member   | - 1:2:4 (20 mm) Gr. 20<br>- Foundation column base                   |
|    | Reinforcement  | · · · · · · · · · · · · · · · · · · ·                                |
|    |  | - separately calculated  |
|    | Data  A Material respective of (C) to the control of the control o |  |
|    | A Material requirement (Cost with transport)   |  |
|    | Cement 1 mt  | - Rs. 19 400.00  |
|    | Sand 1 m <sup>3</sup>  | - Rs 4 000.00  |
|    | Metal (20mm) 1m <sup>3</sup>   | - Rs. 3 500.00   |
|    | Water - free   |  |
|    | B Labour requirement   |  |
|    | 10/7 to produce 1m <sup>3</sup> of concrete - Mixer  | - Rs. 4 000.00   |
|    | Unloading and stacking of 1 mt of cement   | - unskilled labourer 01 hour   |
|    | To lay 1m <sup>3</sup> of finished concrete at the column base   | - unskilled labourer - 02 hours                                      |
|    | C Wastage  |  |
|    | Residue waste, transport   | - <b>2</b> ½%  |
|    | D Wages for Labourer (08 hours)  |  |
|    | unskilled labourer   | - Rs. 1 500.00   |
|    | E others   |  |
|    | Weight of 1 m <sup>3</sup> of cement   | - 1.40 mt  |
|    | Over Head & Profit   | - 30%  |
|    | Shrinkage in mixing concrete   | - 50%  |
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|        | (20 marks)   |

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