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ை විභාග දෙපාර්තු තුන්ව කි. **ලොද්ගුල දෙපාර්තුවේ වි**දුන් විභාග දෙපාර්තමේත්තුව ලි ලංකා විභාග දෙපාර්තමේත්තුව இலங்கைப் பரிட்சைத் திணைக்களும் a Department of **இலங்கைப்** 6 r**ய்ரி** டி**ன் சுத**ா**தினைக்களும்**, Sri Lanka Department of Examinations, Sri Lanka ந்துள்ள இது பெறுக்கும் இருக்கும் இருக்கும் இருக்கும் இருக்கும் இருக்கும் இருக்கும் இருக்கும் இருக்கும் இருக்கு இருக்கும் இருக்கும் இருக்கும் இருக்கும் இருக்கும் இருக்கும் இருக்கும் இருக்கும் இருக்கும் பரிட்சைத் திணைக்களம்

අධායන පොදු සහතික පතු (උසස් පෙළ) විභාගය, 2020 கல்விப் பொதுத் தராதரப் பத்திர (உயர் தர)ப் பரீட்சை, 2020 General Certificate of Education (Adv. Level) Examination, 2020

විදුලිය, ඉලෙක්ටොනික හා තොරතුරු තාක්ෂණවේදය மின், இலத்திரன் தகவல் தொழினுட்பவியல் Electrical, Electronic and Information Technology II



පැය තුනයි மூன்று மணித்தியாலம் Three hours

පැය තුනයි மூன்று மணித்தியாலம் Three hours

අමතර කියවීම් 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 you will answer and decide which of them you will prioritise.

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Important:

- * This question paper consists of 14 pages.
- * This question paper comprises Parts A, B and C. The time allotted for all parts is three hours. (Use of calculators is not allowed.)

Part A - Structured Essay (09 pages)

- * Answer all the questions on this paper itself.
- * Write your answers in the space provided for each question. Note that the space provided is sufficient for your answers and that extensive answers are not expected.

Part B and C - Essay (05 pages)

- * Select two questions from each of the parts $\mathbb B$ and $\mathbb C$ and answer four questions only. Use the papers supplied for this purpose. At the end of the time allotted for this paper, tie the three parts together so that Part A is on the top of Part B and C before handing over to the supervisor.
- * You are permitted to remove only Parts B and C of the question paper from the Examination Hall.

For Examiner's Use Only

Part	Q. No.	Marks
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A	3	
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B	6	
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Final Marks

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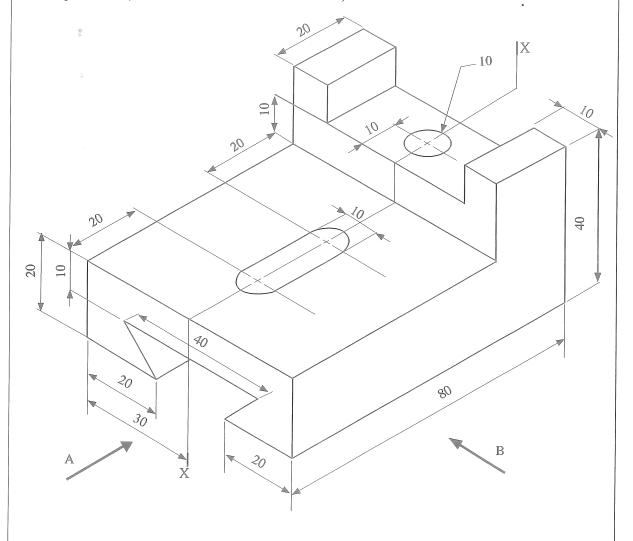
PART A — Structured Essay

Answer all four questions on this paper itself.

(Each question carries 10 marks)

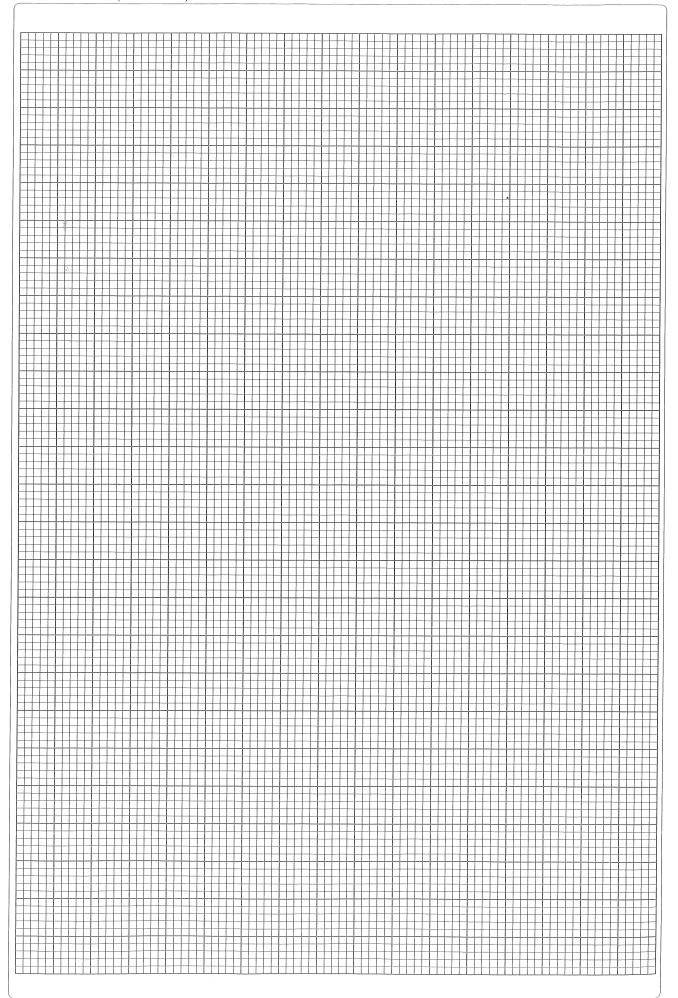
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1. The diagram shows an isometric view of a bracket made of light steel. The bracket is symmetric along the vertical plane passing through X-X. Assuming any missing dimensions draw the following views to a suitable scale using first angle projection principles. Show all relevant dimensions in the sketches. Use the graph sheets given on page 3 and 4 to answer the questions. (All dimensions are in millimetres.)



- (i) Front elevation seen through direction A
- (ii) End elevation seen through direction B
- (iii) Plan

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) = .		lucti	that you are assigned to develop the Information Technology (IT) infrastructure for ng online classes for a school during Covid-19 pandemic. The requirements are given	Do not write in this column
		*	A recording room to record video lessons to be uploaded to the school website.	
		*	A room for teachers to conduct online classes, in realtime. Students should be able to participate in the classes interactively.	
		*	Computer station to prepare teaching materials, e.g. power point slide presentations.	
		*	Use of online storage and online documents during classes.	
	Assi	ume	that the school administration is designing a room with IT facilities.	
	(a)		ere are stations with desktop computers (main central processing unit-CPU, monitor, board and mouse) in the room.	
	3	(i)	Write two additional hardware items required for each station.	
		(ii)	Name one software item that can be used to conduct and record online classes, in realtime.	
	(b)		Name two additional hardware items required by students to connect with online classes in realtime.	
		(ii)	List one facility required for students in addition to the hardware items mentioned in (b)(i) above, to connect with online classes.	
	(c)		he learning activities require students to interactively prepare a group project report ine, suggest one on-line facility that they could use for this purpose.	
	(d)		eacher has requested a method to share additional reading materials with students. State ways you would suggest to fulfill this purpose.	

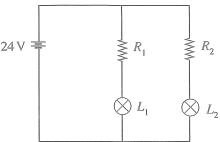
3.		circuit consisting of an NPN transistor is shown below. Here, X is the input and Y is output. Assume that the transistor is made of Silicon, and $\beta = 50$.	Do not write in this column
		15 V	Corami
		n <	
		$R_C \stackrel{>}{\geqslant}$	
		V_{Y}	
		<i>Y</i>	
		V_X R_B	
		X ·—WW	
		20 kΩ	
		ZO KSE	
		宣	
	(a)	If $V_X = 0 \text{ V}$, show that the transistor is in the cut-off region.	
		<u> </u>	
		<u>.</u>	

	(b)	For the above case in (a), find the output voltage V_{ν} .	
	<i>(</i>)	TC T7	
	(c)	If $V_x = 5$ V, assuming that the transistor is in the saturation region determine I_B .	

	For the above case in (c), find the output voltage V_{γ} .	
e)	For the above case in (c), show that the transistor is actually in the saturation region by using the values of I_C an I_B .	
	If the voltage range for logic '0' is 0 V to 0.5 V and the voltage range for logic '1' is 4.5 V to 5 V. Can this circuit be used as a NOT gate? Briefly explain.	
	is 4.5 V to 5 V. Can this circuit be used as a NOT gate? Briefly explain.	
	is 4.5 V to 5 V. Can this circuit be used as a NOT gate? Briefly explain.	
	is 4.5 V to 5 V. Can this circuit be used as a NOT gate? Briefly explain.	
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	is 4.5 V to 5 V. Can this circuit be used as a NOT gate? Briefly explain.	
	is 4.5 V to 5 V. Can this circuit be used as a NOT gate? Briefly explain.	

4. Following circuit is prepared by a teacher for demonstrating measurements during a laboratory session.

Do not write in this column



Resistances of R_1 and R_2 are $100~\rm k\Omega$ and $1~\rm k\Omega$ respectively. Resistance across L_1 and L_2 lamps are measured as $12~\Omega$ and $10~\Omega$ respectively.

(a). State measuring equipment and appropriate range for measuring following.

managament ont	o quinment	rango
measurement	equipment	range
(i) voltage across R_1		
(ii) voltage across R_2		
(iii) current across R_1		
(iv) current across R_2		

(b) Draw the circuit in space below and indicate how each measuring equipment mentioned in (a)) can be connected.

(c)	Following components are given to a group of students in a school. - 230 V to 30 V stepdown transformer	Do not write in this column
	- 230 V to 12 V stepdown transformer	
	- one BJT transistor	
	- eight diodes	
	- one operational amplifier K	
	- 1000 μF capacitor .	
	(i) List items required to develop a full bridge rectifier circuit for supplying 24 V DC	
*	from 230 V AC instead of 24 V DC source in the circuit.	
3		
	(ii) Draw the circuit diagram of the rectifier circuit.	
		\$ i
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	* *	