Candidate's	Framination	No
Canaiaaie S	Examination	110

THE UNITED REPUBLIC OF TANZANIA MINISTRY OF EDUCATION AND VOCATIONAL TRAINING FORM TWO SECONDARY EDUCATION EXAMINATION, 2009

0084

ELECTRICAL ENGINEERING

TIME: 21/2 HOURS

INSTRUCTIONS

- 1. This paper consists of sections A and B.
- 2. Attempt **ALL** questions in section A. In section B answer **ALL** questions from the area of your specialisation.
- 3. **ALL** answers should be written in the spaces provided.
- 4. **ALL** writing must be in blue or black ink **EXCEPT** drawings which must be in pencil.
- 5. Write your examination number at the top right hand corner of every page.
- 6. Cellphones and calculators are not allowed in the examination room.

FOR EXAMINER'S USE ONLY				
QUESTION NUMBER	SCORE	INITIALS OF EXAMINER		
1		-		
2				
3				
4				
5	- V			
6				
7				
8'				
TOTAL				

This paper consists of 13 printed pages.

SECTION A

GENERAL (60 MARKS)

1. Choose provide	the correct answer and write its corresponding letter in ${f d}_{f c}$	the box
L (I)	The first step to assist a shocked person is to: A. call an ambulance B. give the victim cold water C. give the victim a mouth to mouth resuscitation D. remove the victim from accident place by hand.	
∠ (ii)	The electrician's head is protected from falling objectusing: A. a cap B. a protective mask C. a safety helmet D. safety goggles,	(6 DY
(111)	The SI unit of electromotive force is: A. coulomb B. farad C. joule D. volt.	
(iv)	The central part of an atom consists of: A. ions and electrons B. electrons and protons C. neutrons and electrons D. protons and neutrons.	
~ (v)	The colour of a live wire in a 3-wire cable is: A. black B. blue C. orange D. red.	
(vi)	The purpose of a transformer is to: A. change magnetic field B. change the voltage C. convert a.c to d.c D. generate electrical power.	

(ii) Mer (1) (2) (3)	ntion three differences be Cell	Batte	
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	and beautiful and		
(îi) Mer	and beautiful and		
(ii) Mei	ntion three differences be	tween a cell and a ba	
(a) (i) De	fine a cell.		
			-
	D. remain the same.		
	C. increase	l.	
	B. decrease		
	A. be negligible		
(x)	When the cross-section a increased, its resistance	area of an electric cond will:	luctor is
	D. 53.3 A		
	C. 18.5 A		horaconomical
	B. 5.3 A		
	A. 1.8 A		
(ix)	Which of the following is rated 240 V, 4.5 kW?	the best fuse for an el	cente cooker
		the bake from for an of	ectric cooker
	D. 5 Ω		
	C. 4 Ω		
	B. 3 Q		Annual Control of the
	Α, ΙΩ		
	and in parallel?		glesses and the same
	equivalent resistance be	tween connections whi	ch are in series
(ASSE	in series or in parallel. \	What is the difference i	n terms or
	Two resistors each havin	no resistance of 2 O car	n be connected
	D, the bodies will repel of	each other.	
	C. the bodies will be dis	charged	Bullion (conjunction)
	B. the bodies will attrac		
	A, there will be no react	tion	And the second second second second
	other		
	the state and was an arrangement of a proper	and the same of th	
1 10	When two bodies of like	charges are brought cl	ose to each

	Candidate's Examination No
F= n(7)	(iii) A primary cell with an e.m.f of 1.4 V and internal resistance of 0.1 Ω is connected to a circuit of resistance 0.4 Ω . Calculate the current in the circuit.
	(b) (i) Define a magnet.
	V (2) N-
	(ii) Name two types of magnet.
	(1)
	(2)
<i>Ā</i> .	(iii) Calculate the rate of change of flux which is required to induce an e.m.f. of 20 kV in an ignition coil consisting of 1200 turns.
I'mf=NX	
	(c) (i) List down three important features of a current measuring instrument.
	(2)
	(3)
	(ii) Electric current produces chemical, magnetic and heating effects. Give two examples which are found in our daily life for each of the above cases. Chemical effects:
	(1)
	(2)
	Magnetic effects: (1)
	(2)

	Candidate's Examination No
Heating effects:	
(1)	Contraction and the Contraction of the Contraction
(2)	***************************************
(iii) Briefly describe the c	onstruction of a moving coil instrument.
d) (i) Calculate the minim	num allowable cross-section area of a PVC
copper cable which w	Ill supply a 240 V distribution fuse board 50 m
copper cable which w	fill supply a 240 V distribution fuse board,50 m out if the total load is 50 A. Take resistivity of
from the supply poin	fill supply a 240 V distribution fuse board,50 m out if the total load is 50 A. Take resistivity of
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(iii) A heating element can boil to litres of water from 10 °C to 70 °C in 2 hours. Find its rating if its working efficiency is 60%. Assume the specific heat capacity of water is 4187 J/kg °C.	0			
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(iii) A heating element can boil 16 litres of water from 10 °C to 70 °C in 2 hours. Find its rating if its working efficiency is 60%. Assume the specific heat capacity of water is 4187 J/kg °C. Dafa given Q = 20°C Time = 2 hii = 60°C HC = 4200 T/hg °C C C C C C C C C C	6.00	Can	idate's Examination No	
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(iii) What is the cost of using an electric iron rated 240 V, 2000 W for 10 hours if the cost of electric energy given by TANESCO is 150/= per unit (1 unit = 1 kWh). (bite given Wolfing=240 W time = 40 km 150 ps unit 150 ps unit 150 ps unit 151 ps unit 152 ps unit 153 ps unit 155 ps	the specif	ic heat capacity of wat	r is 4187 J/kg °C.	
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3. (a) State the use of each of the following tools:	Vot Por tiv	tage=240V ver=2000W ve = 10 hrs		
3. (a) State the use of each of the following tools:				
				ARKS)
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	(i) C	ombination plier		
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(iv) Bradwal (iv) Bradwal (iv) Sketch a symbol for each of the following accessories (ii) Electric brazer (iii) One way three gang switch (ii) Main switch (iii) Main switch (iii) Name one application of an Barth Leakage Circuit Breaker (ELCB).		Candidate o Reamination (1)
(iii) Section deposition of an Earth Leakage Circuit Sceaker (ELCB).	(14) Micha existed	
(iv) Bradwaj (iv) Bradwaj (iv) Sketch a symbol for each of the following accessories (iv) Foste (ii) One way three gang switch (ii) Twist floorescent (iii) Main switch (ii) Define the term "earth lead". (iii) Name one application of an Earth Leakage Circuit Bresker (ELCB).		
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(ii) Define the term "earth lead". (iii) Name one application of an Earth Leakage Circuit Breaker (ELCB).		
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(ii) Define the term "earth lead", (iii) Name one application of an Earth Leakage Circuit Breaker (BLCB).		
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(a) (b) Define the term "earth lead",	WI STOWNSER SPELLET	(VV) FOOG
(a) (i) Define the term "earth lead",		
(a) (i) Define the term "earth lead",		
(a) (i) Define the term "earth lead",	till One way three gang on	169 GALGARIA BUSHININ PAR
(a) (i) Define the term "earth lead",		Est court they contain
(a) (i) Define the term "earth lead",		
(a) (i) Define the term "earth lead",		
(ii) Name one application of an Earth Leakage Catook Breaker (ELCB). ———————————————————————————————————	(iii) Main switch	
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(ii) Name one application of an Earth Leakage Catook Breaker (ELCB). ———————————————————————————————————		
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(ii) Name one application of an Bartin Leakage Crosse Bresker (BLCB).		uuuuuuuuuuuuuuuuuuuuuuuuuuuuuuu
(ii) Name one application of an Earth Leakage Crocks Breaker (ELCB).	mannannannannannannannannannannannannann	annananananananananananananananananana
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	(ii) Briefly explain the operation of a bimetallic strip.
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	Management and the second seco

) (i) Design a circuit which can operate two lamps independently.
(ii)	The resistance of a coil at 20 °C was 20 Ω . What current will it draw from a 10 V supply when operating in a cold room at 0 °C?
	$(\infty = 0.0043/^{\circ}C).$

Q

ELECTRONICS, RADIO REPAIR AND TELEVISION SERVICING

*	(40 MARKS)
6. tai tii W	hat is a "heat sink"?
o. (e) (i)	differential transfer and the second
	entimente merrina and management and
	ekilistiirinistiiriiriiriiriiriiriiriiriiriiriiriiriir

(ii)	What is the importance of using a heat sink?
	• • • • • • • • • • • • • • • • • • • •
	· · · · · · · · · · · · · · · · · · ·
(b) Sket	ch a neat symbol for each of the following:
	Photodiode (iii) Electrolytic capacitor
	MAN-TOWN L
	1 - Fragistor
(ii)	Light dependent resistor (iv) Temperature dependent resistor
14.4) Horizone - passister
(4-) across contracts
7	A certain resistor is identified by its colour code as follows:
7.)(a) (i)	RED, RED, BLACK, GOLD. What is a working range of the
	resistor?
	Tesistor.

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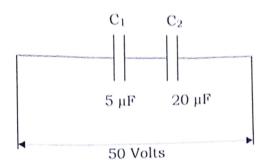
(ii) Write down the actual value of each resistor shown below if $F = \pm 1\%$, $G = \pm 2\%$, $J = \pm 5\%$, $K = \pm 5\%$ and $M = \pm 20\%$ are tolerances to the resistors.

R33M

- (b) (i) Sketch the three transistor configurations:
 - (1) Common Emitter
 - (2) Common Base
 - (3) Common Collector
 - (ii) Draw a transistor amplifier in CE mode with coupling and decoupling component included.

	1,04	transportion No.			
	Can	didate's Examination No.	The same	(iii)	Fr
	(i) What type of flux is used in s	oldering?	Christian		
a . (a)	(i) What type of flux is used in s	\$700fexections executed \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	1		
	the second in solder	TITIM:			4.1
	(I) had two tools used in some				
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		A A STATE OF THE S	The second second		
	(iii) Name five materials used i	n soldering:			
	(1)	ritinitini (ili			
	(2) existences executive continues of the	HILLIAMIA			
	(2)			0)	
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	(5)				
(1	The state of the s	iencyr			
	(ii) Calculate the resonance	frequency when 2 r	mH inductor and 80	pF	
	capacitor are connected	in series. Use f = 5			
	and the second	1			
		STILL			
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		(C) Li	Ds. Fic	1/34	1/1
		1,000	" 1"		
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(iii) From the circuit shown below, calculate the charge on capacitor C_1 and C_2 ,



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