FIJI NATIONAL UNIVERSITY

COLLEGE OF ENGINEERING, SCIENCE AND TECHNOLOGY

SCHOOL OF ELECTRICAL & ELECTRONICS ENGINEERING

CERTIFICATE IV IN ELECTRICAL ENGINEERING
STAGE 3

EEE392 –ELECTRONICS FOR ELECTRICIANS 1

FINAL EXAMINATION – PENSTER 1 - 2015

DAY/DATE: As per Timetable

TIME: As per Timetable ROOM: As per Timetable

INSTRUCTIONS TO STUDENTS

1. You are allowed 10 minutes Extra reading time during which you are NOT to write.

2. Begin each answer on a fresh page and use both sides of the sheet.

3. Write your candidate-number at the top of each attached sheet

4. Insert all written foolscaps, graph paper, drawing paper, etc. in their correct sequence and secure with string

5. For all sheets of paper on which rough/draft work has been done, cross it though and you MUST ATTACH to your answer scripts.

6. Write clearly the number(s) of the question(s) attempted on the top of each sheet.

7. ANSWER ALL QUESTIONS.

8. Show all workings where necessary.

9. Do not use programmable calculators, especially the ones that do the conversions of number systems.

10. ***ALWAYS CHECK YOUR WORK BEFORE YOU LEAVE THE EXAM ROOM****!*

SECTION A: **Multiple Choice** **(20 marks)**

Instructions:

Choose the correct answer by circling the correct letter(A, B, C, or D) in the matrix provided at the end of the Question Paper. Attach this sheet to your Answer Booklet. Each Question is worth 1 mark.

1. Identify the best resistor in any sunset switch for any street light.

    a) VDR
    b) LDR
    c) Thermistor
    d) Rheostat.

2. What do we call the part of a circuit board whose function is to absorb the heat given by heat producing components?

    a) Transistor
    b) Printed Circuit Board
    c) Heat Sink
    d) Edge Connectors

3. Choose the resistor that corresponds to the Brown, Black, black, Red, Brown resistor:

    A. 1002 Ω ±1%
    B. 10000 Ω ±1%
    C. 10 MΩ ±1%
    D. 102 Ω ±1%

4. What is the correct feature of DIP (Dual In Line) IC package?

    a) Have only 14 pins
    b) Have only 8 pins
    c) Have the same number of pins on both sides of the IC
    d) Have more than 12 gates

5. What is the function of a Zener diode in a power supply circuit?

    a) Maintains a fixed voltage
    b) Amplifies voltage output
    c) Transforms voltage levels
    d) Converts AC to DC

6. A VDR (Voltage Dependent Resistor) is best used in

    a) Streetlights to control lights
    b) Temperature Sensing circuits
    c) Power controls to control current output
    d) Voltage surge protector in transmission lines

7. Name the diode that has a gate.

    a) Diac.
    b) Rectifier diode.
    c) SCR.
    d) Light emitting diode.

8. How many terminals does a Field Effect Transistor have?

    a) 2
    b) 3
    c) 1
    d) 4

9. Rectifier diodes are made from silicon. What is its typical forward voltage drop?

    a) 0.7 V
    b) 3 V
    c) 0.9 V
    d) 12 V

10. What is the value of a capacitor marked with **103**?

    a) 10 000 pF
    b) 10 pF
    c) 0.3 pF
    d) 1 000 pF

11. How many resistor base values are contained in the E24 series?

    A. 24
    B. 25
    C. 23
    D. 12

12. How many terminals do you find in a potentiometer?

    a) 2
    b) 3
    c) 4
    d) 8

13. A choke in the fluorescent light is an example of:

    a) Capacitor.
    b) Resistor.
    c) LDR.
    d) Inductor.

14. If you want to do fine adjustment in the variation of the capacitance, name the appropriate component:

    a) Trimpot.
    b) Trimmer.
    c) Variac.
    d) Potentiometer.

15. For an NTC type of electronic component, what happens to its values when there is an increase in temperature?

    a) Value will increase as well
    b) Value will decrease
    c) No change in value
    d) Value will not be steady and fluctuates.

16. Which tolerance value will you obtain from an E6 resistor series table?

    a) ±10 %
    b) ±5 %
    c) ±1 %
    d) ±20 %

17. How many junctions do you find in a bipolar junction transistor?

    a) 1
    b) 2
    c) 3
    d) 4

18. In which colour band will you find the range for either the resistance or capacitance ?

    a) First band.
    b) Second band.
    c) Multiplier band.
    d) Tolerance band.

19. Name the switch that will ONLY make contact if you press it.

    a) Toggle switch.
    b) Push button switch.
    c) Slide switch.
    d) DIP switch.

20. Which of the following is likely to be the power rating of a carbon compound resistor?

    a) 0.1 W
    b) 1.0 KW
    c) 0.5W
    d) 0.3 W

SECTION B: Fill In the Blanks – Component Symbols & Functions
(20 marks)
Instructions:

Fill in the Blanks by drawing the circuit symbol and stating the function of the component in the Circuit.

COMPONENT	***CIRCUIT SYMBOL***	***FUNCTION IN THE CIRCUIT***
(a) Zener Diode		
(b) Thermistor		
(c) Electro-magnetic relay		
(d) Transformer		
(e) Light-dependent resistor(LDR)		
(f) Microphone		
(g) Polarised Capacitor		
(h) Photo Transistor		
(i) Silicon-controlled rectifier(SCR)		
(j) Light-emitting Diode (LED)		

SECTION C: Component, Connector & Cable identification (10 marks)

Instructions:

Short answer questions:

1. Identify the following connectors and components:

(a)

(1 mark)

(b)

(1 mark)

(c)

(1 mark)

(d)

(1 mark)

(e)

(1 mark)

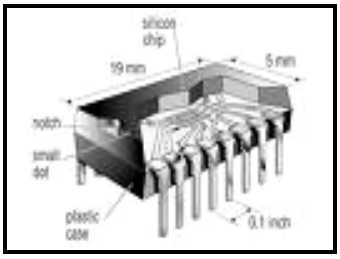
(f)

(1 mark)

(g)

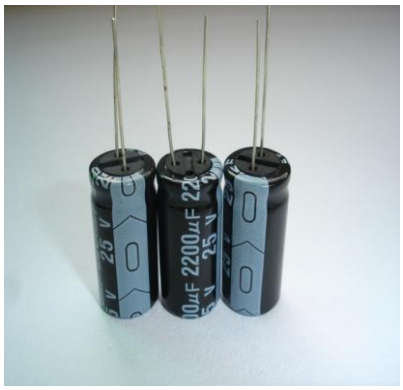
(1 mark)

(h)



(1 mark)

(i)



(1 mark)

(j)

(1 mark))

SECTION D: Data sheets, operations & calculations (50 marks)

Instructions:

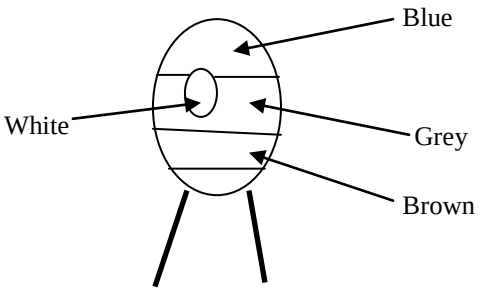
Use the attached data sheets to assist you.

1. Determine the actual resistor values from the following colour-coded resistors:
   (a) Orange, red, orange (2 marks)
   (b) Blue, green, red, gold (2 marks)

2. Determine the capacitance values:

a) 261 K (2 marks)
b) 5n2 D (2 marks)

c)



(2 marks)

3. If a particular 4-band resistor has its Upper value as 9,020Ω and Lower value as 7,380Ω. Calculate the following :

(a) Range (2 marks)
(b) Preferred value (2 marks)
(c) Tolerance value, using the Upper Value (2 marks)
(d) Colour code (2 mark)

4. Use the BJT Data Sheet provided to answer the questions asked.

TYPE	CASE	POL MAT	V_{CE}	V_{CB}	$I_{C\ mA}$	V_{CES} @$I_{C\ mA}$	H_{fe} @ $I_{C\ mA}$	P(TOT) mW	USE	EQUIVALENT
BD140	TO-126	PS	80	100	1.5A	0.5@500	40@250	8W	G.P. o/p	40410
BC107	TO-18	NS	45	50	100	0.25@10	110@450	300	G.P.S.S. amp	BC207, BC147, BC182
BC559	TO-92 VAR 1	PS	30	30	100	0.65@100	125@800	500	G.P.S.S. amp	BC159
2N3055	TO-3	NS	60	70	15 A	1.1@4A	20@704A	115W	G.P. power	BDY 20
TIP 3055	TOP-3	NS	70	100	15 A	1.1@4A	20@ 4A	90W	Power output	MJE 3055

a) Current gain of BC159 and what current can this transistor operate from? (2 marks)
b) Material used in all transistors? (1 mark)
c) Abbreviation of G.P.S.S. from the table. (2 marks)
d) Power dissipation of BC147? (1 mark)
e) Package of BDY20? (1 mark)
f) Polarity of the BC182 transistor? (1 mark)

5 (a) Identify 2 types of seven segment display (2 marks)
(b) Draw the diagram of the 2 types of seven segment display. Label the terminals and segments clearly. (7 marks)
(c) State 2 applications of seven segment display (2 marks)

6 What do the abbreviations: TTL and CMOS stand for? (2 marks)

7 Explain what is meant by a Darlington Pair. (2 marks)

8 List any 2 advantages and any 2 disadvantages of a relay. (4 marks)

9 State the 5 uses of an audio transformer. (5 marks)

********** **THE END** **********

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EEE392 Electronics for Electricians 1
Final Examination Penster 1 – 2015

Section A : Multiple-Choice
Candidate Number: _____

Circle the correct letter in the matrix provided.

1	A	B	C	D
2	A	B	C	D
3	A	B	C	D
4	A	B	C	D
5	A	B	C	D
6	A	B	C	D
7	A	B	C	D
8	A	B	C	D
9	A	B	C	D
10	A	B	C	D
11	A	B	C	D
12	A	B	C	D
13	A	B	C	D
14	A	B	C	D
15	A	B	C	D
16	A	B	C	D
17	A	B	C	D
18	A	B	C	D
19	A	B	C	D
20	A	B	C	D

Note: Please attach this page to your Answer Booklet.