



COLLEGE OF ENGINEERING, SCIENCE & TECHNOLOGY (CEST)

SCHOOL OF ELECTRICAL & ELECTRONICS ENGINEERING

CERTIFICATE IV IN ELECTRICAL ENGINEERING-STAGE 3

EEE392- ELECTRONICS FOR ELECTRICIANS 1

FINAL EXAMINATION – PENSTER 1, 2015

SOLUTIONS

DAY/DATE OF EXAMINATION: As per Timetable

TIME: As per Timetable

VENUE: As per Timetable

EXAMINER: Ulaiasi Gudru

NO OF PAGES 6

MARKING SCHEME

SCHOOL: Electrical and Electronic Engineering.

COURSE: Certificate IV in Electrical Engineering – Stage 3.

SUBJECT: EEE392 – Electronics for Electricians 1.

DATE : As per Timetable


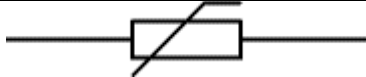
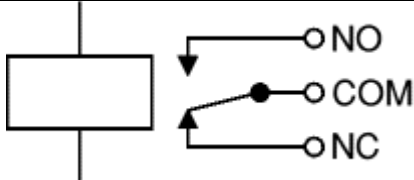
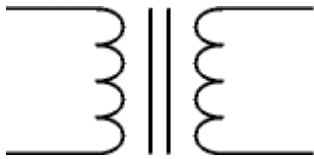
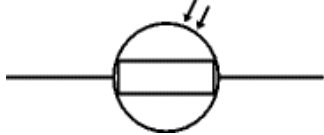
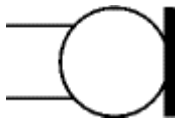
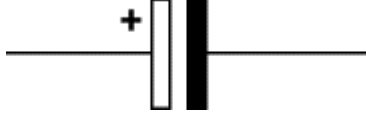
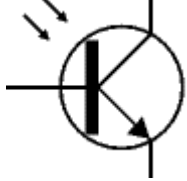
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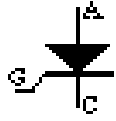
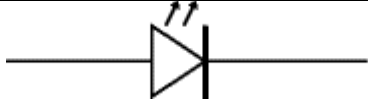
SECTION A: MULTIPLE CHOICE [1 Mark each: Total: 20 Marks]

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

SECTION B**Fill in the Blanks [20 MARKS]****Instructions:**

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

COMPONENT	CIRCUIT SYMBOL	FUNCTION IN THE CIRCUIT
(a) Zener Diode		A special diode which is used to maintain a fixed voltage across its terminals.
(b) Thermistor		A transducer which converts temperature (heat) to resistance (an electrical property).
(c) Electro-magnetic relay		-an electrically operated switch. -allows one circuit to switch a second circuit which can be completely separate from the first.
(d) Transformer		- changes high ac voltages/currents to low Voltages/currents and vice versa
(e) Light-dependent resistor		-are special linear resistors, the resistance of which decreases with an increase of illumination onto it.
(f) Microphone		A transducer which converts sound to electrical energy.
(g) Polarised Capacitor		A capacitor stores electric charge. This type must be connected the correct way round. A capacitor is used with a resistor in a timing circuit. It can also be used as a filter, to block DC signals but pass AC signals.
(h) NPN bipolar junction transistor.		A light-sensitive transistor.

(i) . SCR		-a solid state switching device that turns current on and off
(j) LED		- emits light when it is forward-biased

Note: Circuit symbol is worth 1 mark and the function is worth 1 mark.

SECTION C

[10 MARKS]

- 1 (a) Jack Plug
- (b) Bridge Rectifier
- (c) Heat sink
- (d) Varistors
- (e) Push button switch
- (f) Integrated Circuit socket
- (g) D-Connector
- (h) Integrated circuit or IC
- (i) Electrolytic capacitors
- (j) Seven segment display

[1 mark each]

SECTION D

[50 MARKS]

1.

- (a) 32000 Ω \pm 20%
- (b) 6500 Ω \pm 5%

[0.5 mark for each colour: 2 mks]

[0.5 mark for each colour: 2 mks]

2

- a) 261 pF \pm 10%
- b) 5.2 nF \pm 0.5%
- c) 6.8 μ F 1.6 V

[2 marks]

[2 marks]

[2 marks]

3. Range = Upper value – Lower value [0.5 mark]

9020 - 7380 [0.5 mark]

1640Ω [0.5 mark]

Preferred value = [upper value – (upper value – lower value) / 2] [0.5 mark]

= [9020 Ω – (9020 Ω – 7380Ω) / 2] [0.5 mark]

= (9020 Ω – 8200 Ω) [0.5 mark]

= 8200 Ω [0.5 mark]

Tolerance = T, Preferred Value = PV & Upper Value = UP

UP = PV+T, ie, %T = $\frac{UP-PV}{PV}$ [0.5 mark]

= $\frac{9020-8200}{8200}$ [0.5 mark]

= +10% [0.5 mark]

Color codes:

PV = 8200Ω ± 10% [1 mark]

Colour codes: **grey, red, red, silver** [2 marks]

4

a) 125 @ 800 mA [2 marks]

b) Silicon [1 mark]

c) General Purpose Small Signal [2 marks]

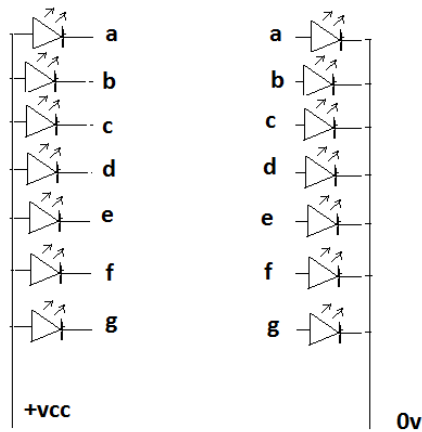
d) 300 mW [1 mark]

e) TO-3 [1 mark]

f) NPN [1 mark]

5 (a) Common Anode and Common Cathode [2 marks]

(b)



[7 marks – ½ for each segment correct]

- (c) i) used in counter circuits like Taxi Meters [1 mark]
ii) display counters for currency exchange [1 mark]

- 6 (a) CMOS – Complementary metal-oxide semiconductor [1 mark]
(b) TTL - Transistor-transistor logic [1 mark]

7 Darlington Pair- These are two transistors connected together – Collectors tied together, while the Emitter of the 1st connected to the Base of the 2nd. The total current is the product of the individual current gains. Thus the Darlington give a very high current gain. [2 marks]

- 8 Advantages- Relays can switch AC and DC
- Relays can switch high voltages
- Relays are a better choice for switching large currents (> 5A). [2 marks]
- Relays can switch many contacts at once. Note: any 2 answers

Disadvantages – Relays are bulkier [2 marks]
- Relays cannot switch rapidly Note: any 2 answers
- Relays use more power due to the current flowing through their coil
- Relays require more current than many ICS can provide.

- 9 (a) . Step up (increase) or step down (decrease) a signal voltage
(b). Increase or decrease the impedance of a circuit
(c). Convert a circuit from unbalanced and vice versa
(d). Block DC current in a circuit while allowing AC current to flow
(e). Electrically isolate one audio device from another. [5 marks]

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