



**SCHOOL OF ELECTRICAL & ELECTRONICS  
ENGINEERING**

**CERTIFICATE IV IN ELECTRICAL ENGINEERING  
STAGE 3**

**EEE392 –ELECTRONICS FOR ELECTRICIANS 1**

**FINAL EXAMINATION – PENSTER 1 - 2012**

**DAY/DATE: 13/6/12**

**TIME: 9:00 – 11:10am**

**ROOM: JNC**

**INSTRUCTIONS TO STUDENTS**

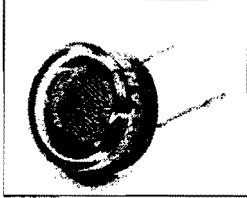
1. *You are allowed 10 minutes Extra reading time during which you are NOT to write.*
2. *Begin each answer on a fresh page and use both sides of the sheet.*
3. *Write your candidate-number at the top of each attached sheet*
4. *Insert all written foolscaps, graph paper, drawing paper, etc. in their 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)**

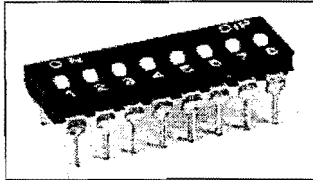
**Instructions:**

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. Choose the component that is pictured below:



- a) Light emitting diode
  - b) Light dependent resistor
  - c) Photo resistor
  - d) Both b) and c)
2. Which connector is widely used for test instruments like the CRO?
- A DIN
  - B BNC
  - C UHF
  - D AF
3. Choose the name of the component as seen:



- a) Integrated circuit
  - b) IC
  - c) DIP Switch
  - d) All of the above.
4. Name the cable shown:
- A Screened cable (mono)
  - B Power
  - C Coaxial
  - D Screened cable (Stereo)

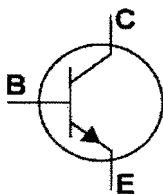


5. Which diode has a gate?
- A Light emitting.
  - B Rectifier diode.
  - C Diac
  - D SCR

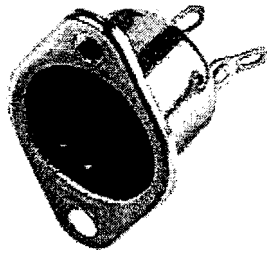
- 6 Identify the component symbol below:
- A Variable Resistor (Preset)
  - B Variable Resistor ( Potentiometer)
  - C Variable Resistor ( Rheostat)
  - D Variable resistor (Light dependent)



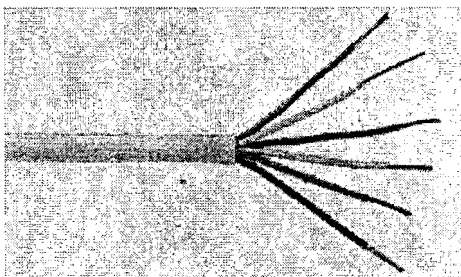
- 7 An antenna in a domestic radio receiver is an example of
- A Inductor
  - B Resistor
  - C LDR.
  - D Capacitor
- 8 The device shown has a DMM on "diode" test with the Red lead connected to B and the Black to C. What would be the reading? Assume a good device.
- A High
  - B O/C
  - C Low
  - D S/C



- 9 What rating reflects the physical size of a resistor?
- A Voltage
  - B Temperature
  - C Current
  - D Power
- 10 What many resistors are contained in the E24 series?
- a) 24
  - b) 25
  - c) 23
  - d) 12
- 11 The diagram shows a
- A D plug
  - B DIN socket
  - C DIN plug
  - D D socket



- 12 The purpose of the braided metal screen on a TV cable is to
- A Stop interference from unwanted signals
  - B Stop interference from wanted signals
  - C Receive interference from unwanted signals
  - D Receive interference from wanted signals
- 13 Which switch returns to its normally open (off) position when the button is released?
- A DIP
  - B DPDT
  - C Push-to-break
  - D Push-to-make
- 14 A power transformer may be used in:
- A Voltage transformation and dc working
  - B Current transformation and filtering
  - C Voltage transformation and isolation
  - D Current transformation and dc working
- 15 A resistor marked 2k7J means:
- a)  $2700\Omega \pm 5\%$
  - b)  $2.7\text{ k}\Omega \pm 5\%$
  - c)  $0.0027\text{ M}\Omega \pm 5\%$
  - d) All of the above.
- 16 Identify the cable shown.
- A Signal
  - B Speaker
  - C Screened
  - D Twisted strand



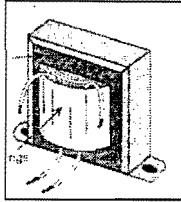
- 17 The parameter  $h_{FE}$  refers to which gain in a BJT?
- A DC current

- B AC current
- C DC voltage
- D AC voltage

- 18 3 things that determine capacitance in a capacitor are:
- A Permittivity, distance between plates and temperature
  - B Distance between plates, permittivity and temperature
  - C Temperature, distance between plates and area of plates
  - D Area of plates, distance between plates, and permittivity

- 19 A DMM ""diode" test on a good SCR with Red lead on the Gate and Black lead on the Cathode would show
- A S/C
  - B Low
  - C O/C
  - D High

20 Name the component as pictured:



- a) Coil
- b) Inductor
- c) Transformer
- d) All of the above

**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.*

<i>COMPONENT</i>	<i>CIRCUIT SYMBOL</i>	<i>FUNCTION IN THE CIRCUIT</i>
(a) Zener Diode		
(b) Thermistor		
(c) Electro-magnetic relay		
(d) Transformer		

(e) Light-dependent resistor(LDR)		
(f) Triac		
(g) Polarised Capacitor		
(h) NPN bipolar junction transistor		
(i) Silicon-controlled rectifier(SCR)		
(j) Light-emitting Diode (LED)		

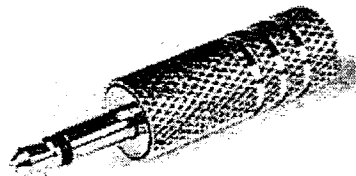
**SECTION C: Component, Connector & Cable identification (10 marks)**

**Instructions:**

*Short answer questions:*

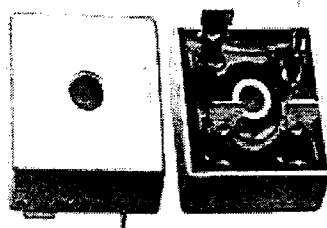
1. Identify the following connectors, cables and components:

(a)



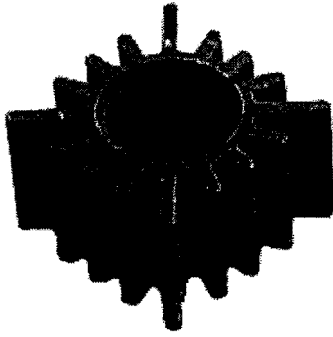
(1 mark)

(b)



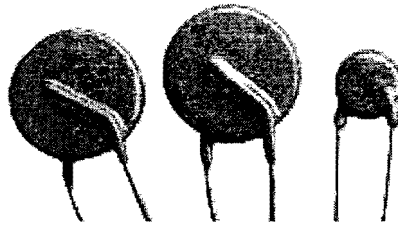
(1 mark)

(c)



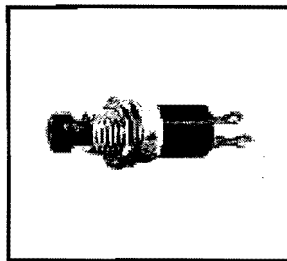
(1 mark)

(d)



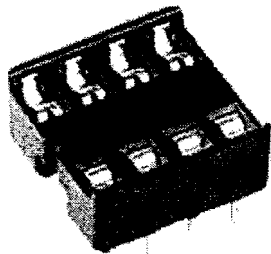
(1 mark)

(e)



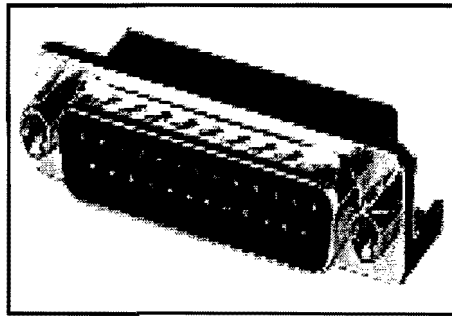
(1 mark)

(f)



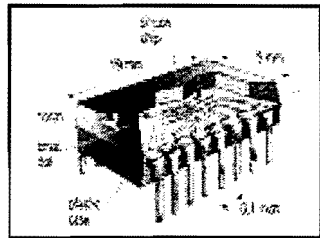
(g)

(1 mark)



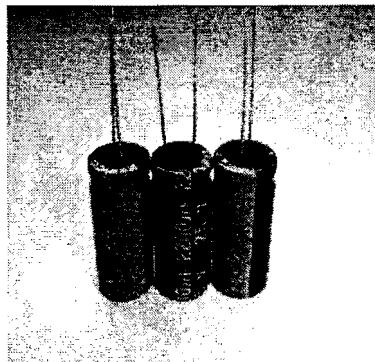
(1 mark)

(h)



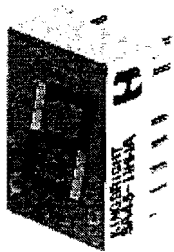
(1 mark)

(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) Red, red, orange, none (2 marks)
  - (b) Blue, violet, red, gold (2 marks)
  - (c) Green, blue, black, silver (2marks)
  - (d) Yellow, white brown, silver, red (2 marks)
  - (e) Orange, red, green, gold, brown (2 marks)
  
2. If a particular 4-band resistor has its Upper value as  $9,020\Omega$  and Lower value as  $7,380\Omega$ . 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)
  
3. Use the BJT Data Sheet provided to answer the questions asked. (8 marks)

TYPE	CASE	POL MAT	$V_{CE}$	$V_{CB}$	$I_{CmA}$	$V_{CES}@I_{CmA}$	$H_{fe}@I_{CmA}$	P(TOT) mW	USE	EQUIVALEN T
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@70 4A	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)
  
- 4
  - (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)
  
- 5 What do the abbreviations: TTL and CMOS stand for? (2 marks)
  
- 6 Explain what is meant by a Darlington Pair. (2 marks)

- 7 List any 2 advantages and any 2 disadvantages of a relay. (4 marks)
- 8 State the 5 uses of an audio transformer. (5 marks)

\*\*\*\*\* THE END \*\*\*\*\*



EEE392      Electronics for Electricians 1      Final Examination      Penster 2 – 2012

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.