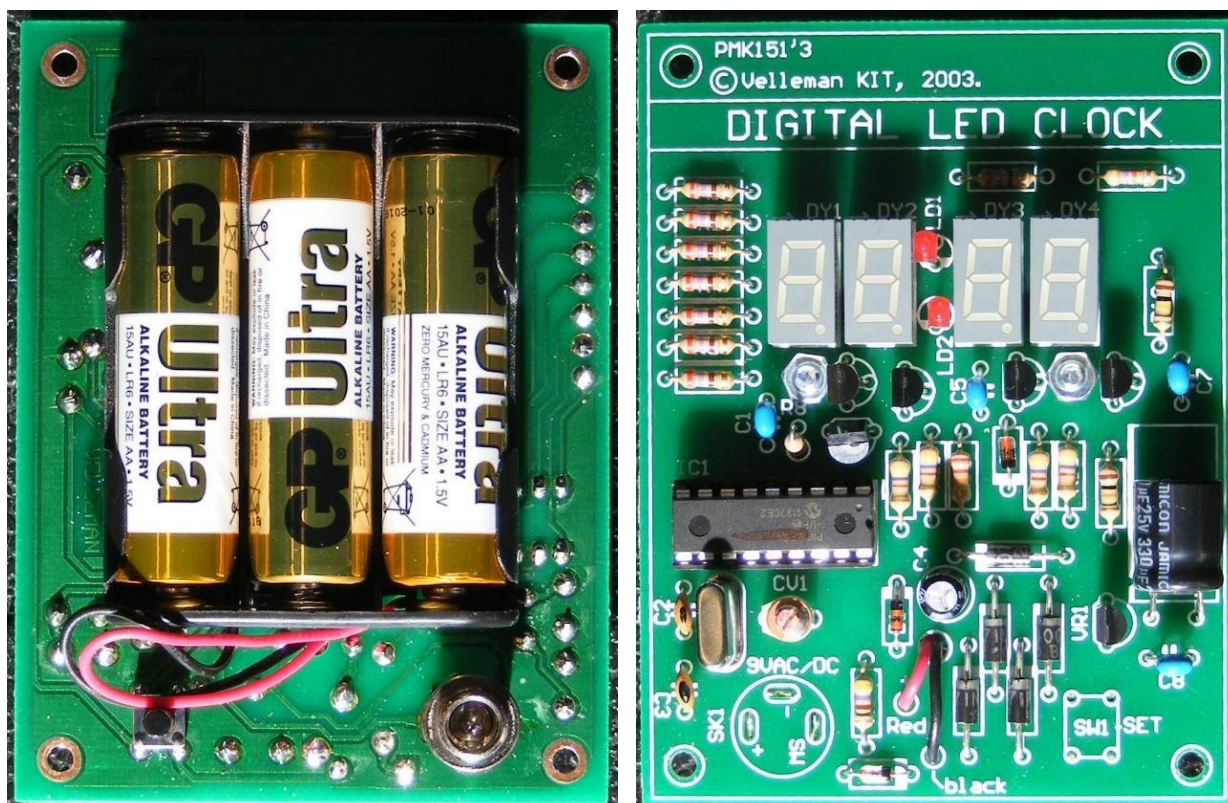


# Industrial Electronics

Time 2hours

Session 1: Construction Project: 'Digital Clock' Score from page 2: \_\_\_\_\_ /25



For this challenge you will need to construct a Digital Clock following the step by step instructions on the following pages.

The following contents have been supplied:-

- a) 1 Kit with assembly instructions including batteries
- b) Circuit Diagram
- c) Criteria on which marks can be awarded

## Description of Task

- 1) Construct the kit using the instructions supplied
- 2) Test completed project.

Marks awarded are as follows:-

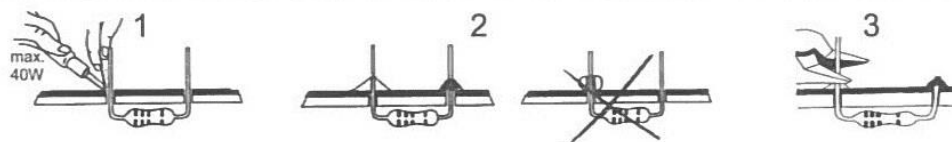
Soldering Quality	12 Marks
Component Placement	6 Marks
Testing	7 Marks

Marks deducted will be as follows:-

Observed error	Deduction
Missing Components	1 per component
Components leads not trimmed to an acceptable standard	1 per component
Quality of component Placement	1 mark deducted for incorrect placement on PCB

	Marks possible	Marks awarded
Soldering Quality	12	
Component Placement	6	
Testing	7	
Total Marks Awarded		
Deduct 1 mark per component for each of the following errors		
Missing Components deductions	-	
Component leads not trimmed to an acceptable standard-		
Quality of component Placement	-	
Total Marks Deducted		
<b>Marks Awarded Minus Marks Deducted (Total score)</b>		

Soldering - Solderen - Soudage - Lötén - Soldadura - Lötning - Juottaminen - Saldatura - Solda

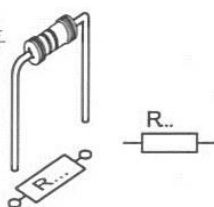


MK151



**1**

Resistor - Weerstand - Résistance - Widerstand - Resistencia - Motstand - Vastus - Resistenze



◇ R1 ... R7, R12 : 270

◇ R16 : 47K

◇ R9 : 470

◇ R10, R11, R14, R15 : 4K7

◇ R13 : 22K

◇ R17 : 10K

◇ R18 : 100K

(Red, Purple, Brown) - (Rood, Paars, Bruin) - (Rouge, Violet, Brun) - (Rot, Violet, Braun) - (Röd, Lila, Brun) - (Punainen, Purppura, Ruskea) - (Rojo, Morado, Marrón) - (Encarnado, Violeta, Castanho) - (Rosso, Viola, Marrone)

(Yellow, Purple, Orange) - (Geel, Paars, Oranje) - (Jaune, Violet, Orange) - (Gelb, Violet, Orange) - (Gul, Lila, Orange) - (Keltainen, Purppura, Oranssi) - (Amarillo, Morado, Naranjado) - (Amarelo, Violeta, Laranja) - (Giallo, Viola, Aranciato)

(Yellow, Purple, Brown) - (Geel, Paars, Bruin) - (Jaune, Violet, Brun) - (Gelb, Violet, Braun) - (Gul, Lila, Brun) - (Keltainen, Purppura, Ruskea) - (Amarillo, Morado, Marrón) - (Amarelo, Violeta, Castanho) - (Giallo, Viola, Marrone) - (Gul, Violet, Brun)

(Yellow, Purple, Red) - (Geel, Paars, Rood) - (Jaune, Violet, Rouge) - (Gelb, Violet, Rot) - (Gul, Lila, Röd) - (Keltainen, Purppura, Punainen) - (Amarillo, Morado, Rojo) - (Amarelo, Violeta, Encarnado) - (Giallo, Viola, Rosso)

(Red, Red, Orange) - (Rood, Rood, Oranje) - (Rouge, Rouge, Orange) - (Rot, Rot, Orange) - (Röd, Röd, Orange) - (Punainen, Punainen, Oranssi) - (Rojo, Rojo, Naranjado) - (Encarnado, Encarnado, Laranja) - (Rosso, Rosso, Aranciato)

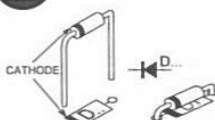
(Brown, Black, Orange) - (Bruin, Zwart, Oranje) - (Brun, noir, Orange) - (Braun, Schwarz, Orange) - (Brun, Svart, Orange) - (Ruskea, Musta, Oranssi) - (Marrón, Negro, Naranjado) - (Castanho, Preto, Laranja) - (Marrone, Nero, Aranciato)

(Brown, Black, Yellow) - (Bruin, zwart, Geel) - (Brun, noir, Jaune) - (Braun, Schwarz, Gelb) - (Brun, Svart, Gul) - (Ruskea, Musta, Keltainen) - (Marrón, Negro, Amarillo) - (Castanho, Preto, Amarelo) - (Marrone, Nero, Giallo)

MK151 - rev.1

**2**

DIODE



◇ D1 : BAT85  
◇ D2 ... D4, D6, D7 : 1N4007  
◇ D5, D8 : 1N4148



**3**

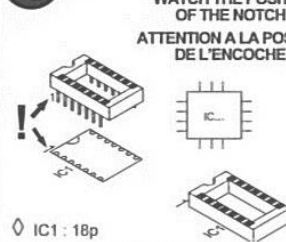
CAPACITOR



◇ C1, C7, C8 : 100nF (104)  
◇ C2 : 22pF (22K)  
◇ C3 : 5pF (4.7)  
◇ C5 : 10nF (103)

**4**

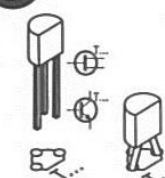
IC SOCKET



◇ IC1 : 18p

**5**

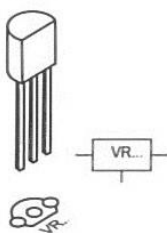
TRANSISTOR



◇ T1 ... T5 : BC547

**6**

VOLTAGE REGULATOR



◇ VR1 : 78L06

**7**

TRIM CAPACITOR



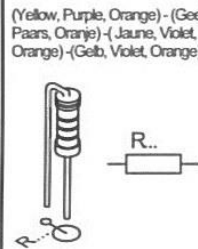
◇ CV1 : 2 - 10pF

CLOCK ADJUST:



**8**

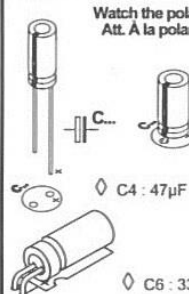
RESISTOR



◇ R8 : 47K

**9**

ELECTROLYTIC CAPACITORS

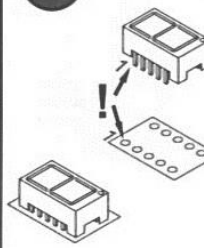


◇ C4 : 47µF

◇ C6 : 330µF

**10**

DISPLAYS



◇ DY1 ... DY4 : SC36-11EWA

**11 LED'S**

Watch the polarity!  
Attention à la polarité!

max. 10mm

max. 3mm

OK

◇ LD1, LD2 : Red / Rood / Rouge / Rot / Röd / Punainen / Rojo / Encarnado / Rosso

**12 CRYSTAL**

**13 IC**

WATCH THE POSITION OF THE NOTCH!  
ATTENTION A LA POSITION DE L'ENCOCHE!

**14 DC FEMALE PLUG**

SOLDERSIDE!

Min. 1mm

◇ X1 : 4,1943 MHz

◇ IC1 : SVK151 (Programmed Pic 16C54C-04)

◇ SK1 : 9V AC/DC IN

**15 PUSH BUTTON**

**16 BACKUP - BATTERY**

PLACE 3 'AA' BATTERIES HERE!

Watch the polarity!  
Att. à la polarité!

Red-Rood-Rouge-Rot-Röd-Punainen-Rojo-Encarnado-Rosso

Black-zwart-noir-Schwarz-Svart-Musta-Negro-Preto-Nero

◇ SW1 : SET

Once constructed test the kit to ensure correct operation, once tested attach your name to the kit and present it to the judges for assessment and marking.

