

SULIT



UNIVERSITI TUN HUSSEIN ONN MALAYSIA

**PEPERIKSAAN AKHIR
SEMESTER III
SESI 2013/2014**

NAMA KURSUS : ELECTRICAL TECHNOLOGY
AND MICRO PROCESSING

KOD KURSUS : DAJ 32302

PROGRAM : DAJ

TARIKH PEPERIKSAAN : OGOS 2014

JANGKA MASA : 3 JAM

ARAHAN : JAWAB LIMA (5) SOALAN
SAHAJA

KERTAS SOALAN INI MENGANDUNGI TUJUH (7) MUKA SURAT BERCETAK

SULIT

SOALAN DI DALAM BAHASA MELAYU

- Q1** (a) Berikan perbezaan di antara semikonduktor jenis-p dan jenis-n. Termasuk atom contoh struktur. (10 markah)
- (b) Lukis dan terangkan rektifikasi gelombang penuh menggunakan *smoothing capacitor* dengan beban rintangan dan carikan satu ungkapan untuk *ripple factor* merentasi beban. (10 markah)
- Q2** (a) Berpandukan **Rajah S2**, Voltan masukan, $V_{in} = 9 + \sin(\omega t)$ Volt dan penghadang potensi voltan, $V_{\phi} = 0.7$ Volt. Menganggap aliran arus terus adalah lebih besar daripada 1 mA, Tentukan aliran arus diod, I_D dan kejatuhan voltan pada diod, V_D . (15 markah)
- (b) Senaraikan tiga jenis diod dan kegunaannya dalam litar elektronik. (5 markah)
- Q3** (a) Lukiskan reka bentuk untuk litar pemacu motor dc menggunakan empat transistor NPN. Terangkan aliran arus litar pemacu dan arah motor. (20 markah)
- Q4** (a) Terangkan perbezaan antara mikropemproses dan mikropengawal, termasuk ciri-ciri umum mikropengawal. (15 markah)
- (b) Terangkan faedah utama dan had menggunakan mikropengawal. (5 markah)
- Q5** (a) Jelaskan organisasi asas memori data PIC. (10 marks)
- (b) Jelaskan organisasi asas timbunan PIC. (10 marks)

- Q6** (a) Merujuk kepada litar dalam **Rajah S6**, apakah tujuan litar RC yang disambungkan ke input RESET mikropengawal.

(5 marks)

- (b) Apakah kesan melaksanakan arahan berikut

```
movlw    b'11110000'
movwf    trisb
```

(5 marks)

- (c) Menganggap bahawa kod berikut baru sahaja dilaksanakan. Apa kandungan *binary* pada *working register*.

```
movlw    2f
addlw    55
```

(10 marks)

- Q7** (a) Berapa lama ia mengambil masa yang diambil untuk melaksanakan arahan pada mikropengawal PIC16F628 berjalan pada *clock* 20 MHz.

```
      goto    L2
L1    movwf   var1
      btfss   var1,0
L2    sublw   10
```

(10 marks)

- (b) Apakah kandungan dalam *working register* selepas melaksanakan urutan arahan berikut.

```
movlw    08
movwf    20
subwf    20, w
```

(10 marks)

SOALAN DI DALAM BAHASA INGGERIS

- Q1** (a) Give the differences between p-type and n-type semiconductors. Include atomic structure illustration. (10 marks)
- (b) Draw and explain full wave rectifier using a smoothing capacitor with a resistance load and find an expression for ripple factor across load. (10 marks)
- Q2** (a) Refer to **Figure Q2**, The source voltage, $v_{in} = 9 + \sin(\omega t)$ Volts and the barrier potential voltage, $V_{\phi} = 0.7$ Volts. Assume the dc current is greater than 1 mA. Determine the the current across the diod, I_D and voltage drop across the diod, V_D . (15 marks)
- (b) List down the three types of diodes and their uses in electronic circuit. (5 marks)
- Q3** (a) Draw the design for dc driver motor using four NPN transistors. Describe the driver current flow and motor direction. (20 marks)
- Q4** (a) Explain the major differences between a microprocessor and a microcontroller, including the typical features of a microcontroller. (15 marks)
- (b) Explain the major benefits and limitations of using a microcontroller. (5 marks)
- Q5** (a) Explain the basic organization of the PIC data memory. (10 marks)
- (b) Explain the basic organization of the PIC stack. (10 marks)

- Q6** (a) For the following circuit in **Figure Q6**, what is the purpose of RC circuit that is connected to the RESET input of the microcontroller. (5 marks)

- (b) What is the effect of executing the following instructions?

```
movlw    b'11110000'
movwf    trisb
```

(5 marks)

- (c) Assume that the following code has just been executed. What the binary content of the working register.

```
movlw    2f
addlw    55
```

(10 marks)

- Q7** (a) How long does it take to execute the following instructions on a PIC 16F628 running at a clock of 20 MHz.

```
        goto    L2
L1      movwf   var1
        btfss  var1,0
L2      sublw   10
```

(10 marks)

- (b) What is the content of the working register after executing the following sequence of instructions.

```
movlw    08
movwf    20
subwf    20, w
```

(10 marks)

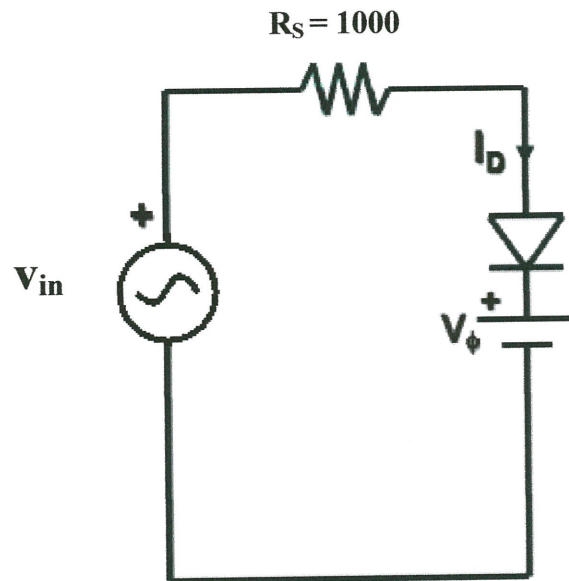
-END OF QUESTION-

PEPERIKSAAAN AKHIR
FINAL EXAMINATION

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RAJAH S2 / FIGURE Q2

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FINAL EXAMINATION

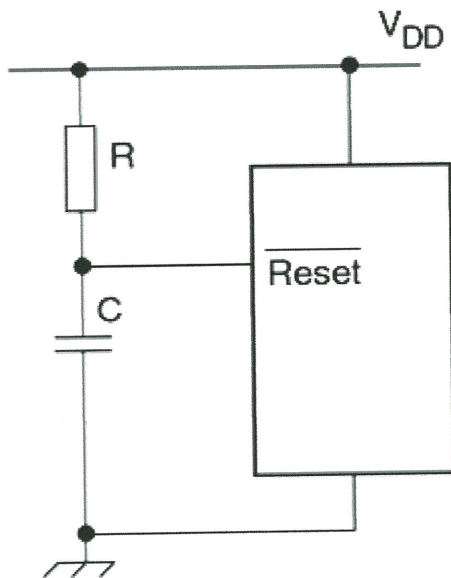
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RAJAH S6 / FIGURE Q6