SOLUTIONS/ MARKING SCHEME
CONFIDENTIAL – Do Not Release to Students

SINGAPORE POLYTECHNIC

_2019 / 20_ Semester _1_ Mid Semester Test

Module Name: _MAPP / EDBPII **Module Code: _ET1010 / ET1216**
Course: _DASE/DESM/DCPE/DEEE/DMRO/DEB_
Year: _2FT_

Set by: _M.Fikret Ercan_

No.	SOLUTION	MARKS	TOTAL MARKS
	Section A		
A1	d	3	
A2	a	3	
A3	b	3	
A4	b	3	
A5	c	3	
A6	a	3	
A7	d	3	
A8	b	3	
A9	c	3	
A10	b	3	
			30

1. All diagrams should be drawn clearly in black. Fine lined images may not be captured by the photocopier.
2. Lines should be drawn as thick as possible and in bold.
3. The use of shading and colouring is discouraged. If shading is necessary, use 5% grey.

SOLUTIONS/ MARKING SCHEME
CONFIDENTIAL – Do Not Release to Students

SINGAPORE POLYTECHNIC

_2019 / 20_ Semester _1_ Mid Semester Test

Module Name: _MAPP / EDBPII **Module Code: _ET1010 / ET1216**
Course: _DASE/DESM/DCPE/DEEE/DMRO/DEB_
Year: _2FT_

Set by: _M.Fikret Ercan

No.	SOLUTION	MARKS	TOTAL MARKS
	Section B		
B1	a) TRISD = 0b 0000 0000; // last bit must be 0	4	
	b) **PORTDbits.RD0 = 1;** // Set pulse HIGH	1	
	delay_ms(2); // delay for 2 ms	2	
	PORTDbits.RD0 = 0; // Set LOW	1	
	delay_ms(18); // delay for 20 ms	2	
	c)		

	int i;
	// configure the pins
	TRISDbits.TRISD0 = 0;
	while (1) {
	for (i=0;i<100;i++) {
	PORTDbits.RD0 = 1; // set HIGH
	delay_ms(2); // delay for 2 ms
	PORTDbits.RD0 = 0; // set LOW
	delay_ms(18); // delay 18 ms
	} // for
	for (i=0;i<150;i++) {
	PORTDbits.RD0 = 1; // set HIGH
	delay_ms(1); // delay for 1ms
	PORTDbits.RD0 = 0; // set LOW
	delay_ms(19); // delay 19 ms
	} // for
	} // while
		2
		2
		2
		2	

			18

1. All diagrams should be drawn clearly in black. Fine lined images may not be captured by the photocopier.
2. Lines should be drawn as thick as possible and in bold.
3. The use of shading and colouring is discouraged. If shading is necessary, use 5% grey.

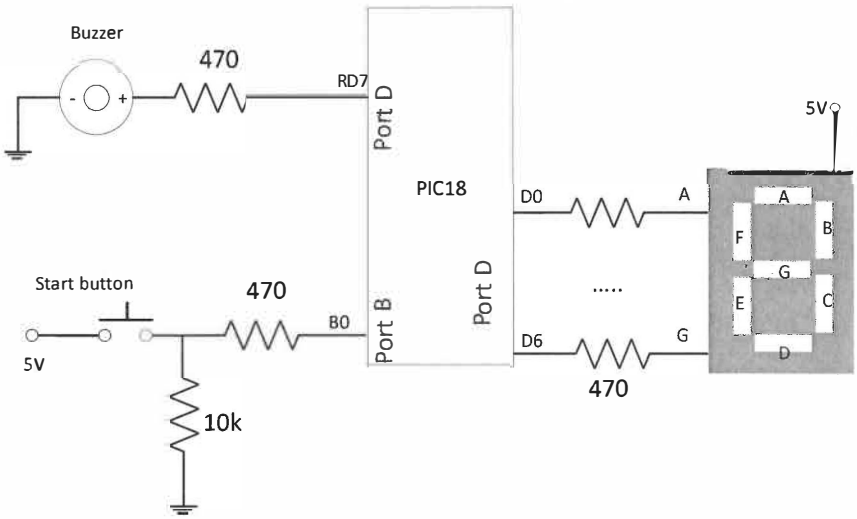
SOLUTIONS/ MARKING SCHEME
CONFIDENTIAL – Do Not Release to Students

SINGAPORE POLYTECHNIC

_2019 / 20_ Semester _1_ Mid Semester Test

Module Name: _MAPP_ / EDBPII **Module Code: _ET1010 / ET1216**
Course: _DASE/DESM/DCPE/DEEE/DMRO/DEB_
Year: _2FT_

Set by: _M. Fikret Ercan

No.	SOLUTION	MARKS	TOTAL MARKS
	Section B		
B2	(a)		
	 Correct seven segment display circuit 2 marks, Correct button circuit 2 marks ,Correct buzzer circuit 2 marks	6	
	(b) TRISD = 0b 0000 0000; TRISB = 0b 1111 1111;	2	

1. All diagrams should be drawn clearly in black. Fine lined images may not be captured by the photocopier.
2. Lines should be drawn as thick as possible and in bold.
3. The use of shading and colouring is discouraged. If shading is necessary, use 5% grey.

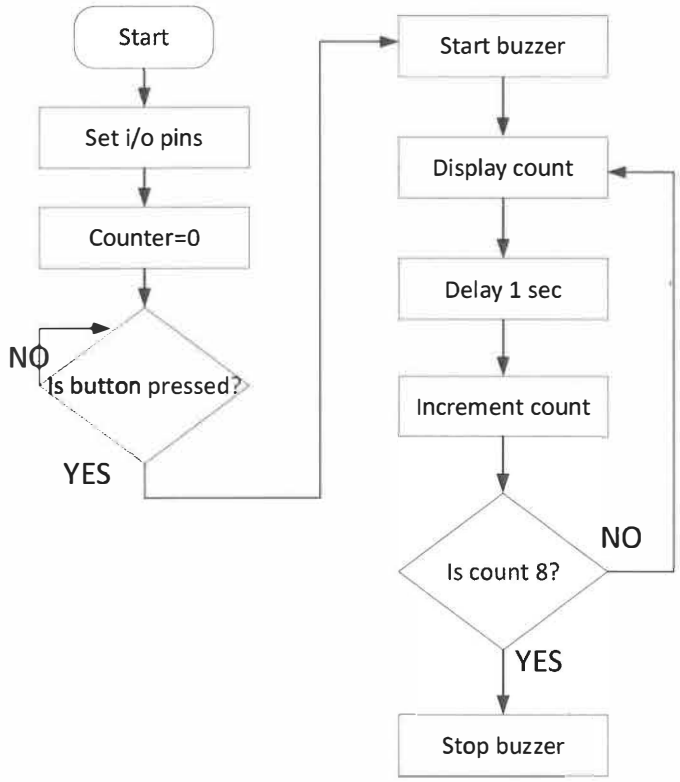
SOLUTIONS/ MARKING SCHEME
CONFIDENTIAL – Do Not Release to Students

SINGAPORE POLYTECHNIC

_2019 / 20_ Semester _1_ Mid Semester Test

Module Name: _MAPP / EDBPII **Module Code: _ET1010 / ET1216**
Course: _DASE/DESM/DCPE/DEEE/DMRO/DEB_
Year: _2FT_

Set by: _M. Fikret Ercan

No.	SOLUTION	MARKS	TOTAL MARKS
	Section B		
B2	(c) 	10	

Display count	F	Start buzzer	E
Stop buzzer	K	Start	A
Set i/O pins	B	Increment counter	H
counter=0	C	Is button pressed?	D
Is count ==8?	J	Delay 1 sec	G

(1 marks for each correct answer. Order for "Set i/o pins" , "counter=0" can be reversed award full mark as long as flow chart works)

			18

1. All diagrams should be drawn clearly in black. Fine lined images may not be captured by the photocopier.
2. Lines should be drawn as thick as possible and in bold.
3. The use of shading and colouring is discouraged. If shading is necessary, use 5% grey.

SOLUTIONS/ MARKING SCHEME
CONFIDENTIAL – Do Not Release to Students

SINGAPORE POLYTECHNIC

_2019 / 20_ Semester _1_ Mid Semester Test

Module Name: _MAPP / EDBPII **Module Code: _ET1010 / ET1216_**
Course: _DASE/DESM/DCPE/DEEE/DMRO/DEB_
Year: _2FT_

Set by: _M. Fikret Ercan

No.	SOLUTION	MARKS	TOTAL MARKS
	Section B		
B3	a) $\frac{5v-0}{10-5} = \frac{2.78-0}{?-5}$ Ph=7.78	4	
	b) 0 and 1023 (or, 0000000000 and 1111111111)	2	
	c) Ph =9 ->818 -> 1100110010 Ph=8 -> 614 -> 1001100110 (3 marks each)	6	
	d) Waiting for AD conversion to complete and data captured	2	
	e) left justified	2	
			16

1. All diagrams should be drawn clearly in black. Fine lined images may not be captured by the photocopier.
2. Lines should be drawn as thick as possible and in bold.
3. The use of shading and colouring is discouraged. If shading is necessary, use 5% grey.

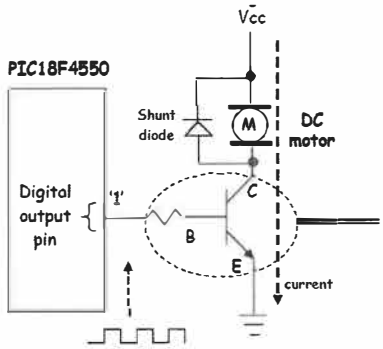
SOLUTIONS/ MARKING SCHEME
CONFIDENTIAL – Do Not Release to Students

SINGAPORE POLYTECHNIC

_2019 / 20_ Semester _1_ Mid Semester Test

Module Name: _MAPP / EDBPII **Module Code: _ET1010 / ET1216_**
Course: _DASE/DESM/DCPE/DEEE/DMRO/DEB_
Year: _2FT_

Set by: _M,Fikret Ercan

No.	SOLUTION	MARKS	TOTAL MARKS
	Section B		
B4	(a) correct use of shunt diode (2 marks), correct connection of motor (2 marks), correct transistor connection (4 marks)  	8	

	(b) Example solution (Student may provide different solution. Award grade based on your professional judgement). Port configuration 2 marks, correct use of while loop (2 marks), correct if-else constructs (6 marks)
	// configure the pins
	int i=0;
	TRISAbits.TRISA0 = 1;
	TRISDbits.TRISD1 = 0;
	while (1) {
	if (PORTAbits.RA0==1 && i==0) {
	delay_ms (2000); // 2 sec delay
	if (PORTAbits.RA0==1) i=1; else i=0; // check if SW1 still pressed
	}
	if ((PORTAbits.RA0==1) &&(i==1)) { // i=1 indicates 2 second delay
	PORTDbits.RD1 = 1; // turn on the motor done
	delay_ms(20); // give a short delay
	}
	else { **PORTDbits.RD1 = 0;** // turn off the motor
	i=0;
	}
	} // while
		10	

			18

1. All diagrams should be drawn clearly in black. Fine lined images may not be captured by the photocopier.
2. Lines should be drawn as thick as possible and in bold.
3. The use of shading and colouring is discouraged. If shading is necessary, use 5% grey.