Full Marks: 80

Answer any five Questions including Q No.1& 2
Figures in the right hand margin indicates marks

Time- 3 Hrs

1.
Answer **All** questions

2 x 10

a. What do you mean by Radix of a number?

b. What is the difference between combinational and sequential logic circuit?

c. What is the function of ALE in 8085 microprocessor?

d. Define modulus of a counter.

e. What are the various modes of 8255 programmable peripheral interface?

f. Distingush between a multiplexer & a demultiplexer.

g. Write down the hardware interrupts in 8085 microprocessor.

h. What is Race around condition in JK flip-flop?

i. Find the 2's complement of (110101.01)$_2$.

j. What are the various flag registers available in 8085 microprocessor?

2.
Answer **Any Six** Questions

6 x 5

a. Explain the working of JK flip-flop with the truth table.

b. What is half adder? Design a full adder circuit using half-adder and OR gate.

c. State and prove De-morgan's theorem.

d. Discuss the various types of addressing modes of 8085 microprocessor with suitable examples.

e. Explain the function of 1:4 Demux circuit with a neat diagram and write its truth table.

f. Draw the timing diagram for MVI B, 05$_H$.

g. Write an assembly language program to add two 8-bit decimal numbers, sum may be of 16 bits.

3. Design a 2-Bit magnitude comparator circuit and explain its operation.   10

4. Draw the functional block diagram of intel 8085 microprocessor and explain the function of each block.   10

5. Simplify and minimise the four variable logic expression using K map.   10

6. $f(A,B,C,D)-\sum -(0,1,2,3,5,7,8,9,10,12,13)$ & implement the real minimal expression in universal logic.
With a neat block diagram design a traffic light controller & write an assembly language program using 8255 Programmable peripheral interface   10

7. Design a 4-bit Asynchronous counter & draw its timing diagram   10

1

TH-III DIGITAL ELECTRONICS AND MICROPROCESSOR

Full Marks: 80

Time- 3 Hrs

Answer any five Questions including Q No.1& 2
Figures in the right hand margin indicates marks

1. Answer All questions

    2 x 10

    a. Which codes are known as self-correcting codes and why?

    b. Why de-multiplexers are referred to as data distributors?

    c. Define racing condition.

    d. State De- Morgan's theorem.

    e. Write down the truth table of a 2 input Exclusive-OR gate?

    f. Solve $(1010)_2-(1010)_2$ using 1's complement.

    g. What is the function of ALU in 8085 microprocessor?

    h. What do you mean by program counter?

    i. Why interfacing is required in microprocessor?

    j. Define opcode and operand.

2. Answer Any Six Questions

    6 x 5

    a. Explain the working of 4:2 encoder with diagram.

    b. With a neat diagram explain the operation of SISO and PIPO register.

    c. Show the logic diagram of a clocked SR flip flop. Explain its working with a functional table.

    d. Which gates are referred to as universal gates and why? How other gates can be realized using NOR gates?

    e. Define stack, stack top and stack pointer and why it is essential.

    f. Draw the timing diagram of MOV A instruction of 8085 microprocessor with neat sketch.

    g. Write an assembly language program for addition of two 8-bit number and sum is 16-bit using 8085 instructions.

3. Design a MOD-10 counter and explain it. 10

4. Draw the functional block diagram of 8085 microprocessor and explain function of each block. 10

5. Simplify and minimize the four variable logic expression using k-map 10
    $F(A,B,C,D)=\Sigma M(2,3,4,5) +d(10,11,12,13,14,15)$

6. Design a 2 bit comparator circuit whose outputs are P>Q, P<Q and P=Q where P and Q are each 2 bit nos. 10

7. Design a traffic light controller with a neat interfacing diagram with 8085 instruction and explain it. 10

1

Th-3 Digital Electronics & Microprocessor

Full Marks: 80

Time- 3 Hrs

Answer any five Questions including Q No.1 & 2

Figures in the right hand margin indicates marks

1. Answer **All** questions   2 x 10
    a. Construct the truth table of NAND and XOR gate.
    b. Convert the following hexadecimal numbers to binary.
        (i)   F297   (ii)   E79A.6A4
    c. Simplify the expression $F = BD + BC\bar{D} + A\bar{B}\bar{C}D$
    d. Why is a multiplexer called a data selector?
    e. What do you mean by toggling?
    f. Write down the transition table for D-flipflop.
    g. Write down the function of following signal of 8085.
        (i)   HOLD   (ii) S_0 & S_1
    h. How many machine cycles are required by the following instructions of 8085?
        (i)   IN 08H;
        (ii)   LXI H, 2450H;
        (iii) MVI B,15H;
        (iv)   MOV C,M;
    i. Give 2 example of instructions for data transfer group and logical group.
    j. What are different operating modes of 8255?

2. Answer **Any Six** Questions   6 x 5
    a. Obtain the real minimal expression for $f = \sum m(0,2,4,6,7,8,10,12,13,15)$ and implement it using universal gates.
    b. Given $\overline{AB} + \bar{A}B = C$, find $\overline{AC} + \bar{A}C$.
    c. Discuss half adder circuit, truth table and implement by using NOR gate.
    d. Design 4-bit asynchronous counter with logic diagram, timing diagram and truth table.
    e. What are various status flags provided in 8085 microprocessor and discuss their role.
    f. Draw the timing diagram for the instruction MVI C,12H.
    g. Write an assembly language program to add two 8-bit numbers, the sum may be of 16 bits.

3   With a neat block diagram explain the architecture of 8085 microprocessor   10
    and explain function of each block.
4   Explain different addressing modes of 8085 microprocessor with examples.   10
5   Draw the block diagram of PPI 8255 and describe each block.   10
6   With neat diagram explain the working of serial-in serial-out and parallel-in   10
    serial-out shift registers with truth table.
7   Draw the circuit diagram of edge triggered JK flip-flop and explain its   10
    operation with the help of a truth table. How is the race around condition
    eliminated?

IV- SEM ELECTRICAL ENGG./ELECTRICAL(I&C)/2019(W)

ETT-421/ETT-405- DIGITAL ELECTRONICS

Full Marks. 80

Time. 3 Hours

Answer any **FIVE** Questions including Q No. 1& 2

Figures in the right hand margin indicates marks

		2x10
Q 1.	Answer ALL the following questions.	
i)	What is modulus of a counter?	
ii)	What is an encoder?	
iii)	Design a Half Adder using basic logic gates.	
iv)	Give examples of some Combinational circuits.	
v)	What is the difference between Latch & Flip Flop?	
vi)	State De-Morgan's Theorem.	
vii)	Write down the difference between synchronous and asynchronous counter.	
viii)	What are the fundamental properties of Boolean Algebra?	
ix)	What are Minterm and Maxterm?	
x)	Subtract the binary number Y=1000011 from X=1010100 using 2's Complement method.	
Q 2.	Answer any **SIX** questions.	
i)	Differentiate between Combinational and Sequential Circuit.	
ii)	What is Race Around Condition in Flip Flop? How it can be avoided?	**5x6**
iii)	What is the difference between Synchronous and Asynchronous Counters?	
iv)	Compare TTL with CMOS Logic Families.	
v)	Convert T-Type flip flop into D-type flip-flop.	
vi)	Write $(AD5)_{16}$ into its equivalent BCD code and Octal Code.	
vii)	Explain the following laws of Boolean Algebra:	
	(a) Complementation Law	
	(b) Absorption Law	
	(c) AND Law	
	(d) OR Law	
	(e) Associative Law	
		[5+5]
Q 3	With neat circuit diagram explain the function of 4:1 Multiplexer and 1:4 Demultiplexer.	

Q.4			
(a)	What is a Karnough map?	2	
(b)	Draw a Karnough Map for the following function of four variables and use it to reduce the function $F = \sum m(0,1,2,4,5,6,8,9,12,13,14)$	5	
(c)	Implement the above obtained circuit using NAND Gates.	3	
Q.5(a)	What is a shift register?	2	
(b)	Describe the working of a parallel-in-parallel-out shift register.	5	
(c)	Complete the timing diagram for this circuit, assuming all Q outputs begin in the low state.	3	
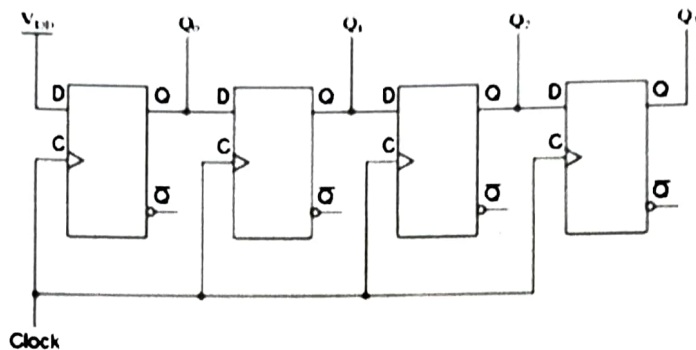
Q.6.(a)	What is a flip flop?	2
(b)	Explain the working of a JK flip flop.	5
(c)	Why edge triggering is preferred over level trigerring.	3
Q.7(a)	What is the basic building block of a sequential logic circuit?	2
(b)	What is a Ripple Counter? Explain its working with necessary logic diagrams.	5
(c)	Draw a logic diagram for a Mod-4 Johnson Counter with its timing diagram.	3

V- SEM ELECT & ETC/ELECTRICAL/2019(W) / (New)

ETT 521-MICROPROCESSOR & ITS INTERFACING

Full Marks: 80   Time : 3 Hours

Answer any FIVE Questions including Q.No.1&2

Figures in the right hand margin indicates marks

1.	Answer ALL the Questions.	[2 x10]
(a)	What are the different mode of operation of 8253?	
(b)	Write the difference between SPR and GPR.	
(c)	What is the function of stack pointer and program counter?	
(d)	Give two examples of 2-byte and 3-byte 8085 Instruction.	
(e)	Define DMA Technique. Which pins of 8085 comes under this group.	
(f)	What do you mean by Non-Maskable interrupt? Give example.	
(g)	What is Microprocessor and Microcontroller?	
(h)	What do you mean by Hand assembler and cross assembler?	
(i)	Write the flag register of 8085?	
(j)	Name various machine cycles of Intel 8085 MPU along with their No of T-States.	
2.	Answer Any SIX Questions.	[5 x 6]
(a)	What is Bus? With neat diagram explain bus structure of 8085 microprocessor.	
(b)	Explain the different addressing modes of 8085 microprocessor with examples.	
(c)	Draw the timing diagram of **INR M** instruction of 8085 microprocessor.	
(d)	Write an ALP to find sum of two 8-bit numbers whose sum is 16-bit using 8085 instruction sets.	
(e)	With proper flow chat explain one register and two register time delay.	
(f)	Explain the working of Digital Clock programme with a neat block diagram.	
(g)	With neat sketch explain the each bit position of Intel 8085 Flag resistor.	
3.	Draw the pin diagram of 8085A microprocessor and explain the function of each pin.	[10]
4.	Draw the functional block diagram of Intel 8255 & explain the function of each block.	[10]
5.	Write an ALP to find the Largest number in an array of 8-bit data. Using 8085 MP Instructions.	[10]
6.	Design and explain the Traffic Light Controller program with a neat block diagram.	[10]
7.	Write an assembly language program to subtract two numbers of 8bit data stored in the memory location 2500H and 2501H and store the result in 2000H	[10]

Total Pages – 4 **IV—Sem/ELECT/2018 (S)(New)**

DIGITAL ELECTRONICS

(Code—ETT-421)

Full Marks : 70

Time : 3 hours

Answer any five questions

Figures in the right-hand margin indicate marks

1. (a) Convert $(101011110.1011)_2$ to octal an hexadecimal numbers.   2

 (b) Discuss 1 : 4 de multiplexer with circuit, truth table and implementation by gates ?   5

 (c) Which gates are referred to as universal gates and why ? How other gates can be implemented by using one of these gates ?   7

2. (a) Define racing condition. How it can be avoided.   2

 (b) Design an 8 : 3 encoder with neat circuit diagram.   5

(*Turn Over*)

 (c) Show the logic diagram of clocked J-K Flip-Flop. Explain it's working with a functional table with a neat circuit diagram.   7

3. (a) State De-Morgan's theorem.   2

 (b) Simplify and minimize the 4-variable logic expression
$F(A, B, C, D) = \Sigma\,(1, 3, 7, 11, 15) + d(0, 2, 5)$
by using k-map and implement its circuit by using NAND gate only.   5

 (c) Draw the logic circuit of full sub tractor. Give its logic expression and truth table. Implement the logic circuit with any one of universal gates ?   7

4. (a) Define the term fan in, fan out and propagation delay ?   2

 (b) Explain the working of SISO and PISO register with the help of suitable logic diagram ?   5

IV – Sem/ELECT/2018(S)(New)(ETT-421)   (*Continued*)

(c) Explain the working of a MOD-8 binary counter with neat diagram. 7

5. (a) Find 2'S complement subtraction of 10110−11010. 2

(b) Simplify the Boolean expression

$$Y = AB + A(B + C) + B(B + C)$$

And draw the logic circuit for the simplified function. https://www.sctevtonline.com 5

(c) Design a 2 bit magnitude comparator circuit for whose outputs are $A > B$, $A < B$ and $A =$ Where A & B are 2 bits binary nos. 7

6. (a) Distinguish between combinational and sequential circuit. 2

(b) Explain weighted and non-weighted binary code. 5

(c) Define SOP and POS term. Obtain the canonical SOP and POS from of the function

$$Y = A + \overline{B}C.$$ 7

7. (a) Write down the truth table of a Exclusive-NOR gate. 2

(b) Explain the operation of seven segments display. 5

(c) Draw the diagram of D Flip-flop. Explain its' working with functional table ? 7

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Total Pages—4

V—Sem/ELECT/2018(W)
(New)

MICROPROCESSOR AND ITS INTERFACING

(Code : ETT-521)

Full Marks : 70

Time : 3 hours

Answer any **five** questions

Figures in the right-hand margin indicate marks

1. (a) Define a Microcomputer and mention atleast two applications of it.   2

   (b) Explain the generation of clock pulse and reset circuit of Intel 8085 A microprocessor.   5

   (c) Draw the functional block diagram of Intel 8251 USART and explain each block.   7

2. (a) What are the different interrupts present in Intel 8085A microprocessor ? Write in-order of their priorities.   2

(*Turn Over*)

(2)

   (b) Discuss different types of addressing modes of Intel 8085A microprocessor with suitable examples.   5

   (c) With necessary interface diagram and software explain the operation of a simple traffic light controller which is controlled by Intel 8085A microprocessor.   7

3. (a) What is a port ? How many ports are there in Intel 8255 PPI ?   2

   (b) Two 8-bit datas 75 H and 25H are present in the memory location 9500H and 9501 H. Write an assembly language program for Intel 8085A microprocessor to find the smaller number and save it in the memory location 9550H.   5

   (c) What is a timing diagram ? Draw the timing diagram for opcode fetch operation of Intel 8085A microprocessor and explain in brief.   7

4. (a) What are the functions of ALE and IO/$\overline{M}$ signals of the intel 8085A microprocessor ?   2

V – Sem/ELECT/2018(W)(New)(ETT-521)   (*Continued*)

(b) What are the different types of memory which are usually used with digital computers? Give their important features in brief. 5

(c) Draw the Interfacing diagram of DAC 0808 with Intel 8085A microprocessor and develop the necessary assembly language program for its operation. 7

5. (a) Define opcode and operand. 2

(b) What are the different status flags present in Intel 8085A microprocessor? Explain the role of each flag. https://www.sctevtonline.com 5

(c) Draw the pin configuration of Intel 8259 PIC and explain each pin. 7

6. (a) How many special purpose registers present in Intel 8085A microprocessor. Enlist them. 2

(b) Define the following instructions in connection with Intel 8085A microprocessor: 5

(i) MVI r, data

(ii) LDA addr

(iii) RAL

(iv) JMP addr(Label)

(v) XCHG

(c) Write an assembly language program for Intel 8085 A microprocessor to add ten(10) eight bit numbers whose sum is also eight bit and save the result in memory location 6500 H. 7

7. (a) What is subroutine? What instruction is used to call a subroutine? 2

(b) What is microprogramming? Give examples of (i) CPUS which used microprogramming (ii) and the CPUS which do not use micro programming. 5

(c) Draw the pin diagram of Intel 8085A microprocessor and explain function each pin. 7

IV—Sem/ELECT/2017(W)
(New)

DIGITAL ELECTRONICS

(Code : ETT-421)

Full Marks : 70

Time : 3 hours

Answer any five questions

Figures in the right-hand margin indicate marks

1. (a) Find the 1's complement and 2's complement of the binary number $(10110100)_2$. **2**

    (b) With a neat circuit diagram explain the function of 1 : 4 Demultiplexer circuit. **5**

    (c) Which gates are referred to as universal gates and why ? How other gates can be Implemented by using NOR gates only ? **7**

2. (a) Convert the decimal number $(95)_{10}$ into its equivalent BCD and Excess-3 Code. **2**

(*Turn Over*)

    (b) Explain the working of Half Adder. Draw its circuit using any one of Universal Gate. **5**

    (c) Obtain the minimal expression using k-map and draw the logic diagram using NAND gates only.

    $$F(P, Q, R, S) = \Sigma m(0, 1, 2, 7, 9, 12, 13) + \Sigma d(3, 5, 8, 10)$$ **7**

3. (a) What is max term and min term ? **2**

    (b) With neat logic diagram explain the operation of seven segment display. **5**

    (c) Design a magnitude comparator circuit. Whose outputs are $A > B$, $A = B$, $A < B$. Where A and B are 2 bit binary numbers. **7**

4. (a) Define fan in and fan out. **2**

    (b) Design a mod-5 synchronous counter with neat circuit diagram. **5**

    (c) With neat logic diagram explain the working

of clocked JK-Flip flop. Convert this flip flop into its equivalent D-flip flop and T-Flip Flop. 7

5. (a) What is Racing and how it can be avoided ? 2

(b) Differentiate between Combinational and Sequential logic circuit. 5

(c) Explain briefly about SISO, SIPO, PISO and PIPO Shift Registers. 7

6. (a) Draw the block diagram of Full adder using two half adder and one or gates. 2

(b) With neat sketch explain the working of Decimal to BCD Encoder. 5

(c) Design and explain the working of a 4 bit Ripple counter with neat logic diagram, truth table and timing diagram. 7

7. (a) What is modulus of a counter ? 2

(b) Design and explain the working of SR Flip flop using NAND gates with functional table. 5

IV – Sem/ELECT/2017(W)(New)(ETT-421) (Turn Over)

(c) Explain the working of R-2R Ladder network type D/A converter with neat diagrams. 7

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IV – Sem/ELECT/2017(W)(New)(ETT-421)   VT – 3,430

DIGITAL ELECTRONICS
(Code : ETT-421)

Full Marks : 80   Time : 3 hours

Answer any **five** questions including **Q. Nos. 1 & 2**

Figures in the right-hand margin indicate marks

1. Answer *all* the questions in brief :   2 × 10

   (a) Define radix or base of a number system.

   (b) Perform 2's complement subtraction of
       010100-011001

   (c) Write down the associative law and distributive law.

   (d) Perform excess-3 subtraction of
       65·3-29·3

   (e) Define Don't Care Condition.

   (f) Draw the symbol and truth table of a three input NAND gate.

   (g) State De-Morgan's theorem.

   (h) Convert the binary number $(01101 \cdot 0110)_2$ to decimal equivalent.

   (i) Draw the AOI logic circuit of
       $$F = \overline{AB + \overline{C}\,\overline{A}}$$

   (j) What is Max. term and Min. term ?

2. Answer any *six* questions :   5 × 6

   (a) Which gates are known as universal gate and why ? How other gates can be realised using NAND gates ?

   (b) Simplify the Boolean expression :
       $$z = \left(A + B\right)\left(A + \overline{B}\right) + \overline{(A\overline{B})} + \overline{A}$$

   (c) With a neat diagram explain the function of 4 : 1 multiplexer.

   (d) Design and explain the working of a clocked SR Flip-Flop using NAND gates with functional table.

   (e) Explain the operation of Full Adder. Draw its circuit using any one of universal gate.

   (f) With neat logic diagram explain the operation of seven segment display.

   (g) Distinguish between combinational logic and sequential logic.

(Turn Over)

3. Design a 2-bit magnitude comparator circuit, where output are $X > Y, X = Y$ if $X < Y$, where X and Y are 2 bit nos.   10

4. Explain the working of SIPO and PIPO register with the help of suitable logic diagram.   10

5. Simplify the expression by using K-Map for four variables

   $F(W, X, Y, Z) = \Sigma m\ (0, 1, 3, 4, 5, 6, 7, 8, 9, 10, 11, 13)$

   and implement using universal (any one) gates.   10

6. Draw the circuit of master-slave JK flip-flop. Explain it with a functional table.   10

7. Discuss the operation of an Asychronous counter with its timing diagram.   10

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DIGITAL ELECTRONICS
(Code : ETT-421)

Full Marks : 70

Time : 3 hours

Answer any **five** questions
Figures in the right-hand margin indicate marks

1. (a) What is decoder and where it is used ? **2**
   (b) Differentiate between combinational and sequential logic. **5**
   (c) Describe the operation of full adder with the help of truth table and circuit diagram. **7**

2. (a) What is the difference between weighted and non-weighted codes ? Give at least two examples of each code. **2**
   (b) Which gates are referred as universal gates and why ? How other gates can be realized using NOR gates only ? **5**
   (c) Describe the working of a clocked JK flip-flop. Show its logic diagram and functional table. **7**

3. (a) Define flip flop and where it is used. **2**
   (b) Design 8 : 1 multiplexer with neat circuit diagram. **5**
   (c) With neat diagram explain the function of 8 : 3 encoder. **7**

4. (a) Convert $(11001 \cdot 110)_2$ binary to decimal number. **2**
   (b) Simplify and minimize the 4-variable logic expression
   $$F(A, B, C, D) = \pi M(4, 6, 8, 9, 10, 12, 13, 14) + d(0, 2, 5)$$
   by using K-map and implement the circuit by using universal gate. **5**
   (c) Explain the working of SIPO and PISO register with the help of suitable logic diagram. **7**

5. (a) Perform BCD addition of
   $$273 + 495$$ **2**
   (b) Obtain the canonical SOP and POS form of the function
   $$Y = A(\bar{B} + A)B$$ **5**
   (c) Explain R-2R ladder type DAC with a neat diagram. **7**

6. (a) Define racing condition. **2**
   (b) Simplify the Boolean expression
   $$F = x\bar{y}z + \bar{x}\,\bar{y}z + \bar{w}xy + w\bar{x}y + wxy$$
   and draw the logic diagram using NAND gates only. **5**

(Turn Over)

(**2**)

(c) Explain the working of a MOD-8 binary counter with neat diagram. 7

7. (a) Draw the excitation table of a S-R flip flop. 2

(b) Draw the diagram of D flip flop. Explain its working with functional table. 5

(c) Explain LED driven using IC7447 decoder. 7

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MICROPROCESSOR AND ITS INTERFACING
(Code : ETT-521)

Full Marks : 70   Time : 3 hours

Answer any **five** questions
Figures in the right-hand margin indicate marks

1. (a) What is microprocessor ?   2

   (b) Describe evolution of microprocessor.   5

   (c) Describe bus structure of 8085 microprocessor.   7

2. (a) What are different interrupts of 8085 microprocessor ?   2

   (b) Describe PSW.   5

   (c) Draw pin diagram of 8085 microprocessor and describe function of each pin.   7

3. (a) What is hand assembler and cross assembler ?   2

   (b) Write a program to find largest data in an array using instructions of 8085.   5

   (c) Explain stack and subroutine.   7

4. (a) What is secondary memory ?   2

   (b) Describe different addressing memory location.   5

   (c) Describe briefly internal organization of RAM and ROM.   7

5. (a) What is T state ?   2

   (b) Draw timing diagram of MOV C, A and explain it.   5

   (c) What is addressing mode ? Describe different type of addressing modes with examples.   7

6. (a) Explain control word of 8255.   2

   (b) Describe operation of ADC 0805.   5

   (c) Describe functional block diagram of 8255 with a neat block diagram.   7

7. (a) Write down the specification of DAC.   2

   (b) Describe interrupt modes of 8259.   5

   (c) Write a program for traffic light control using 8085 instruction sets and interfacing kits.   7

MICROPROCESSOR AND ITS INTERFACING
(Code : ETT-521)

Full Marks : 70   *Time* : 3 hours

Answer any **five** questions

Figures in the right-hand margin indicate marks

1. (a) What is microprocessor ?   2

    (b) Describe evolution of microprocessor.   5

    (c) Describe bus structure of 8085 microprocessor.   7

2. (a) What are different interrupts of 8085 microprocessor ?   2

    (b) Describe PSW.   5

    (c) Draw pin diagram of 8085 microprocessor and describe function of each pin.   7

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    (c) Explain stack and subroutine.   7

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    (b) Describe different addressing memory location.   5

    (c) Describe briefly internal organization of RAM and ROM.   7

5. (a) What is T state ?   2

    (b) Draw timing diagram of MOV C, A and explain it.   5

    (c) What is addressing mode ? Describe different type of addressing modes with
         examples.   7

6. (a) Explain control word of 8255.   2

    (b) Describe operation of ADC 0805.   5

    (c) Describe functional block diagram of 8255 with a neat block diagram.   7

7. (a) Write down the specification of DAC.   2

    (b) Describe interrupt modes of 8259.   5

    (c) Write a program for traffic light control using 8085 instruction sets and inter-
         facing kits.   7

V—Sem/ELECT/2017(W)(New)

MICROPROCESSOR AND ITS INTERFACING

(Code : ETT-521)

Full Marks : 70

Time : 3 hours

Answer any **five** questions

Figures in the right-hand margin indicate marks

1. (a) What is BUS ? What are different buses in microprocessor ? 2

   (b) What is the difference between SPR and GPR ? 5

   (c) Draw and explain the pin diagram of 8085 microprocessor. 7

2. (a) Write the flag register of 8085. 2

   (b) Explain about the evolution of micro-processor. 5

(c) Explain briefly different addressing mode of 8085 with example. 7

3. (a) What do you mean by DMA technique? 2

(b) Draw the timing diagram of instruction MVI A, 90H.(Assume memory location 8051 and 8052). 5

(c) Explain the CALL instruction. 7

4. (a) Define an instruction cycle. 2

(b) What is time delay? Calculate the time delay for two register. 5

(c) Explain the functional block diagram of 8259. 7

5. (a) Give one example of 1-byte, 2-byte and 3-byte instruction. 2

(b) What is interrupt? What are types of interrupt in 8085? Explain each with example. 5

(c) Write an assembly language programme find addition of two 8-bit numbers whose sum is 16-bit. 7

6. (a) Differentiate Hand assembler and Cross assembler. 2

(b) Describe the operational modes of Intel 8253. 5

(c) Design a Traffic Light Controller with a neat interfacing diagram with 8085 instruction. 7

7. (a) What is the difference between instruction CALL and JUMP? 2

(b) Explain the principle of operation of ADC 0801 with example. 5

(c) Draw the functional block diagram of 8255 and explain each block. 7

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(c) Explain briefly different addressing mode of 8085 with example.   7

3. (a) What do you mean by DMA technique ?   2

(b) Draw the timing diagram of instruction MVI A, 90H.(Assume memory location 8051 and 8052).   5

(c) Explain the CALL instruction.   7

4. (a) Define an instruction cycle.   2

(b) What is time delay ? Calculate the time delay for two register.   5

(c) Explain the functional block diagram of 8259.   7

5. (a) Give one example of 1-byte, 2-byte and 3-byte instruction.   2

(b) What is interrupt ? What are types of interrupt in 8085 ? Explain each with example.   5

(c) Write an assembly language programme to find addition of two 8-bit numbers whose sum is 16-bit.   7

6. (a) Differentiate Hand assembler and Cross assembler.   2

(b) Describe the operational modes of Intel 8253.   5

(c) Design a Traffic Light Controller with a neat interfacing diagram with 8085 instruction.   7

7. (a) What is the difference between instruction CALL and JUMP ?   2

(b) Explain the principle of operation of ADC 0801 with example.   5

(c) Draw the functional block diagram of 8255 and explain each block.   7

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DIGITAL ELECTRONICS

(ETT – 421)

Full Marks : 70

Time : 3 hours

Answer any **five** questions

The figures in the right-hand margin indicate marks

1. (a) Convert binary number $(110101.011)_2$ to decimal number.   2

   (b) Design 3 : 8 decoder with neat circuit diagram.   5

   (c) Which gates are referred to as universal gates and why ? How other gates can be implemented by using NAND gates only ?   7

2. (a) Perform Excess –3 Subtraction of 97 – 72.   2

   (b) Simplify the Boolean expression

   $$Y(A,B,C) = A\left[B+C\left(\overline{AB+AC}\right)\right]$$

   and draw the logic circuit using NAND gates only.   5

(c) Explain the working of full adder. Draw its logic circuit and truth table.   7

3. (a) Define modulus of a counter.   2

(b) Explain the operation of 7 segment display.   5

(c) Simplify the following expression using the K-Map for Y-Variables.

$$F(A,B,C,D) = \sum{}_m(0,2,4,5,6,7,8,10,13,15)$$

and implement this circuit by using NAND gate.   7

4. (a) What is an encoder and where it is used ?   2

(b) Differentiate between asynchronous and synchronous counters.   5

(c) With neat logic diagram explain the working of a clocked SR flip-flop with a functional table.   7

5. (a) State associative and distributive law.   2

(b) With a neat diagram explain the operation of PIPO and PISO register.   5

(Continued)

(c) Explain the working of MOD-10 binary counter with neat diagram.   7

6. (a) Write the truth table of a NAND gate with symbol.   2

(b) With neat circuit diagram explain the function of 1 : 8 DE-MUX.   5

(c) Explain R-2R ladder type DAC with a neat diagram.   7

7. (a) Which code is known as self correcting code and why ?   2

(b) Differentiate between combinational and sequential logic circuit.   5

(c) Draw the logic diagram of Master-slave JK flip-flop. Explain it with a functional table.   7

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