

**NRT/KS/19/2236**

**Bachelor of Computer Application (B.C.A.) Semester—IV Examination**  
**DIGITAL ELECTRONICS—II**  
**Paper—VI**

Time : Three Hours]

[Maximum Marks : 50

- N.B. :—** (1) **ALL** questions are compulsory and carry equal marks  
(2) Draw neat and labelled diagram wherever necessary.

**EITHER**

1. (a) What is Adder ? Explain the construction and working of full Adder circuit using Logic gates. 5  
(b) Draw logic diagram for 4:1 multiplexer using gates and explain its truth table. 5

**OR**

- (c) What is parallel Adder ? Explain the construction and working of 4-bit binary Adder circuit. 5  
(d) What is decoder ? Explain the construction and working of 2:4 decoder with logic gates. 5

**EITHER**

2. (a) Explain the construction and working of 4-bit up-counter with its timing diagram. 5  
(b) What is Flip-Flop ? Explain the construction and working of Clocked RS-FF using NAND gates. 5

**OR**

- (c) What is counter ? Explain the construction and working of 3-bit down counter. 5  
(d) What is modulus of counter ? Explain decode counter in brief. 5

**EITHER**

3. (a) What is Addressing Mode ? Explain any two addressing modes of 8086  $\mu$ p with suitable examples. 5  
(b) What is flag ? Explain flag register of 8086  $\mu$ p in detail. 5

**OR**

- (c) Explain the function of following pins of 8086 microprocessor :  
(i) ALE  
(ii) READY  
(iii)  $\overline{\text{TEST}}$ . 5  
(d) Explain the general purpose registers in 8086. 5

**EITHER**

4. (a) What are the different Arithmetic group instructions available in 8086  $\mu$ p ? Explain any two arithmetical group instructions with example. 5  
(b) Write an ALP using instructions of 8086  $\mu$ p to find an Average of an array containing five 8 bit numbers. 5

**OR**

- (c) What is Assembler directives ? Explain any two assembler directives in detail. 5  
(d) Write an ALP to find factorial of given 8-bit number. 5

5. (a) What is Encoder ? Explain. 2½  
(b) What is shift register ? Explain any one type of shift register. 2½  
(c) Give five salient features of 8086  $\mu$ p. 2½  
(d) Explain conditional branch instructions of 8086. 2½

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Time : Three Hours]

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- N.B. :—** (1) All questions are compulsory and carry equal marks.  
 (2) Draw a well labelled diagram wherever necessary.

**EITHER**

1. (A) Draw the logic diagram of a Full Adder and explain its working. 5  
 (B) What is Multiplexer ? Draw the logic diagram of 4 : 1 MUX using NAND gates only and explain its working. 5

**OR**

- (C) Draw the logic diagram of a Full subtractor and explain its working. 5  
 (D) What is decoder ? Draw the logic diagram of 2 : 4 decoder and explain its working. 5

**EITHER**

2. (A) State the advantages of JK Flip-Flop over SR Flip-Flop. Explain Clock JK Flip-Flop. 5  
 (B) Draw the 4-bit ripple counter and explain its operation. 5

**OR**

- (C) What is Counter ? Explain the difference between synchronous and asynchronous counter. 5  
 (D) Draw the logic diagram of UP-DOWN counter and explain its operation. 5

**EITHER**

3. (A) Draw the block diagram of IC 8086 and explain the function of general purpose registers in it. 5

(B) Explain the function of :

- (i) READY  
 (ii)  $\overline{MN} / \overline{MX}$   
 (iii)  $\overline{LOCK}$   
 (iv) RESET  
 (v)  $\overline{S_0} \overline{S_1} \overline{S_2}$  5

**OR**

- (C) Explain the different addressing modes of 8086. 5  
 (D) Explain BIU architecture of 8086 microprocessor. 5

**EITHER**

4. (A) Explain the assembler directives and operators. 5  
(B) Explain the instructions used for string manipulations. 5

**OR**

- (C) Explain the branch group instructions. 5  
(D) Write a program to arrange the data in ascending order in an array. 5
5. Attempt **all** :
- (A) Explain parity decoder. 2½  
(B) What is a register ? Explain the types of shift register. 2½  
(C) Explain the functions of :  
(i) TEST  
(ii) BHE  
(iii) NIM. 2½  
(D) Explain flag instructions with 8086 assembly language. 2½

**TKN/KS/16/5980**

**Bachelor of Computer Application (B.C.A.) Part—II  
(Semester—IV) (C.B.S.) Examination**

**DIGITAL ELECTRONICS—II**

**Paper—VI**

Time : Three Hours]

[Maximum Marks : 50

**N.B. :—**(1) **ALL** questions are compulsory.

(2) Draw a well labelled diagram wherever necessary.

**EITHER**

1. (a) Draw the logic diagram of 4-bit binary Adder/ Subtractor and explain its working. 5
- (b) What is Demultiplexer ? Draw the logic diagram of 1 : 4 DMUX and explain its working. 5

**OR**

- (c) What is Encoder ? Draw the logic circuit and explain its working. 5
- (d) What is parity ? Draw the logic diagram of 8-bit parity detector and explain its working. 5

**EITHER**

2. (a) Construct a D-Flip-Flop using NOR gates only and explain its operation. 5

- (b) Explain the difference between Synchronous and Asynchronous counter. Draw the circuit diagram of 4-bit Synchronous counter. 5

**OR**

- (c) Draw the logic diagram of JKMS Flip-Flop and explain its working. 5
- (d) What is register ? Explain the SISO type of shift registers. 5

**EITHER**

3. (a) Explain the function of following pins in 8086 :

- (i) BHE/S7
- (ii) TEST
- (iii) NIM
- (iv) DT/R
- (v) HOLD and HOLDA. 5

- (b) Write an ALP to add series of 16 numbers. 5

**OR**

- (c) Explain the different addressing modes of 8086. 5
- (d) Draw the block diagram of IC 8086 and explain the function of ALU. 5

**EITHER**

4. (a) Explain any five Arithmetic instruction of IC 8086. 5

- (b) Explain the Flag register of 8086. 5

**OR**

- (c) Explain the branch group instruction. 5

- (d) Write a program to multiply the two number using conditional instruction. 5

5. (a) Draw the logic diagram of Half adder and explain its working. 2½

- (b) Draw the logic diagram of UP/DOWN counter and explain its working. 2½

- (c) Explain physical and logical address of IC 8086. 2½

- (d) Explain the assembler directives. 2½

**TKN/KS/16/5980**

**Bachelor of Computer Application (B.C.A.) Part—II  
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**DIGITAL ELECTRONICS—II**

**Paper—VI**

Time : Three Hours]

[Maximum Marks : 50

**N.B. :—**(1) **ALL** questions are compulsory.

(2) Draw a well labelled diagram wherever necessary.

**EITHER**

1. (a) Draw the logic diagram of 4-bit binary Adder/ Subtractor and explain its working. 5
- (b) What is Demultiplexer ? Draw the logic diagram of 1 : 4 DMUX and explain its working. 5

**OR**

- (c) What is Encoder ? Draw the logic circuit and explain its working. 5
- (d) What is parity ? Draw the logic diagram of 8-bit parity detector and explain its working. 5

**EITHER**

2. (a) Construct a D-Flip-Flop using NOR gates only and explain its operation. 5

- (b) Explain the difference between Synchronous and Asynchronous counter. Draw the circuit diagram of 4-bit Synchronous counter. 5

**OR**

- (c) Draw the logic diagram of JKMS Flip-Flop and explain its working. 5
- (d) What is register ? Explain the SISO type of shift registers. 5

**EITHER**

3. (a) Explain the function of following pins in 8086 :
- (i) BHE/S7
  - (ii) TEST
  - (iii) NIM
  - (iv) DT/R
  - (v) HOLD and HOLDA. 5
- (b) Write an ALP to add series of 16 numbers. 5

**OR**

- (c) Explain the different addressing modes of 8086. 5
- (d) Draw the block diagram of IC 8086 and explain the function of ALU. 5

**EITHER**

4. (a) Explain any five Arithmetic instruction of IC 8086. 5
- (b) Explain the Flag register of 8086. 5
- OR**
- (c) Explain the branch group instruction. 5
- (d) Write a program to multiply the two number using conditional instruction. 5
5. (a) Draw the logic diagram of Half adder and explain its working. 2½
- (b) Draw the logic diagram of UP/DOWN counter and explain its working. 2½
- (c) Explain physical and logical address of IC 8086. 2½
- (d) Explain the assembler directives. 2½

**Bachelor of Computer Application (B.C.A.) Semester—IV (C.B.S.) Examination**

**DIGITAL ELECTRONICS—II**

**Paper—VI**

Time : Three Hours]

[Maximum Marks : 50

**N.B. :—** (1) **ALL** questions are compulsory and carry equal marks.

(2) Draw a suitable diagram wherever necessary.

**EITHER**

1. (a) What are the differences between sequential and combinational circuit ? Explain the construction and working of a half adder circuit using logic gates. 5
- (b) What is Decoder ? Explain the construction and working of 2 : 4 decoder with logic gates. Give its truth table also. 5

**OR**

- (c) Design a 8 : 1 MUX circuit using 4 : 1 MUX circuit. Give its truth table also. 5
- (d) What is parallel adder ? Explain the construction and working of 4-bit binary adder circuit. 5

**EITHER**

2. (a) Explain the construction and working of JKFF using NAND gate. Explain race around condition in it. 5
- (b) Explain the construction and working of 4-bit down counter with its timing diagram. 5

**OR**

- (c) What is Ring Counter ? Explain the construction and working of 3-bit ring counter with truth table. 5
- (d) What is modulus of counter ? Explain decade counter in brief. 5

**EITHER**

3. (a) Draw a block diagram of architecture of 8086  $\mu$ p and explain the function of instruction queue in it. 5
- (b) What are the different addressing modes available in 8086  $\mu$ p ? Explain any two addressing modes with suitable example. 5



**OR**

- (c) Explain the stack pointer register of 8086  $\mu$ p with example. 5
- (d) Explain the function of following pin of 8086 microprocessor :
- (i)  $\overline{\text{TEST}}$
- (ii)  $\text{MN} / \overline{\text{MX}}$
- (iii) ALE. 5

**EITHER**

4. (a) What are the different logical group instructions available in 8086  $\mu$ p ? Explain any two logical group instructions with example. 5
- (b) Write an ALP using instructions of 8086  $\mu$ p to add the contents of an array containing 10 numbers. 5

**OR**

- (c) Explain the flag register format of 8086  $\mu$ p. 5
- (d) Write an ALP to find the 1's complement of given number without using complement instruction. 5
5. Attempt **ALL** :
- (a) What is Encoder ? Explain. 2½
- (b) What is register ? Explain the types of shift registers. 2½
- (c) Give five features of 8086  $\mu$ p. 2½
- (d) Write a short note on Assembler Directives. 2½

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**DIGITAL ELECTRONICS-II**

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[Maximum Marks : 50

**N.B. :**— (1) **ALL** questions are compulsory and carry equal marks.

(2) Draw neat labelled diagrams wherever necessary.

**EITHER**

1. (a) Draw a 4 bit parallel adder circuit and explain its working. 5  
 (b) Design a 8 : 1 multiplexer using 4 : 1 multiplexer. 5

**OR**

- (c) Draw a 4 bit binary subtractor and explain its working. 5  
 (d) What is a decoder ? Design a 3 to 8 line decoder circuit using K-map. 5

**EITHER**

2. (a) Construct a clocked RSFF using only Nano gates and explain its working. 5  
 (b) Explain the construction and working of mod-6 asynchronous counter. 5

**OR**

- (c) What is race around condition ? Explain the methods of avoiding race around condition. 5  
 (d) Explain the construction and working of 3-bit synchronous counter. 5

**EITHER**

3. (a) Draw the block diagram of 8086. Explain. 5  
 (b) Write an ALP to add series of 10 numbers. 5

**OR**

- (c) What are different addressing modes of 8086 ? Explain. 5  
 (d) What are the different flags of 8086 ? Explain. 5

**EITHER**

4. (a) What do you mean by assembler directives ? Explain with suitable example. 5  
 (b) What are the different transfer control instructions ? Explain. 5

**OR**

- (c) Write ALP to multiply two numbers. 5  
 (d) Explain string manipulation instructions with example. 5

5. (a) Draw a full adder circuit and explain its working. 2½  
 (b) Draw JKMSFF using only NAND gates and explain its working. 2½  
 (c) What are the different interrupts of 8086 ? 2½  
 (d) Write ALP to add two numbers stored in memory. 2½

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Time : Three Hours]

[Maximum Marks : 50

- N.B. :—** (1) All questions are compulsory.  
 (2) All questions carry equal marks.

**EITHER**

1. (A) What is Full Adder? Explain construction and working of Full Adder. 5  
 (B) Explain construction and working of parallel 4 bit Adder/Subtractor. 5

**OR**

- (C) What is MUX? Explain the construction and working of 16 : 1 MUX. 5  
 (D) Explain the function of Encoder. Draw logic diagram for decimal to BCD encoder. 5

**EITHER**

2. (A) Explain the construction and working of JKMS flip-flop using NAND gates. 5  
 (B) What is modulus of a counter? Explain construction and working of MOD-Y-counter. 5

**OR**

- (C) Construct and explain the working of 3 bit up counter. 5  
 (D) What is Shift Register? Draw and explain PIPO mode of shift Register. 5

**EITHER**

3. (A) Draw and explain the Flag Register of 8086 Microprocessor. 5  
 (B) What are addressing mode? Explain any two of them with example. 5

**OR**

- (C) Explain the function of EU and BIU of 8086 Microprocessor. 5  
 (D) Explain the signification of following pins :  
 (i) HOLD (ii) READY 5

**EITHER**

4. (A) What is Control transfer instruction? Explain JMP instruction in detail. 5  
 (B) Write Assembly language program for finding factorial of number 04H. 5

**OR**

- (C) What are Assembler directives and operators ? Explain the following :  
 (i) EQU (ii) DW  
 (iii) OFFSET (iv) ORG 5

- (D) What are logical instructions ? Explain any four of them. 5

5. Attempt **All** :

- (A) Construct the 16 : 1 MUX using 4 : 1 MUX 2½  
 (B) Discuss the D-flip-flop using NAND gate. 2½  
 (C) Explain function of Instruction Queue. 2½  
 (D) Explain PUSH and POP instruction. 2½