



**B.E DEGREE EXAMINATIONS: MAY 2017**

(Regulation 2014)

Sixth Semester

**AERONAUTICAL ENGINEERING**

U14AET601 : Digital Electronics and Microprocessor

**COURSE OUTCOMES**

- CO 1: Design complex digital circuits.
- CO 2: Develop assembly language programs using 8085 for various applications.
- CO 3: Calculate the execution time of 8085 instructions for a computer.
- CO 4: Interface and control various peripherals with 8085 microprocessor.
- CO 5: Detect errors in digital data communication.

**Time: Three Hours**

**Maximum Marks: 100**

**Answer all the Questions:-**

**PART A (10 x 1 = 10 Marks)**

1. Matching type item with multiple choice code

CO1 [K<sub>1</sub>]

| List I | List II                 |
|--------|-------------------------|
| A.     | i. AB                   |
| B.     | ii. $\overline{AB}$     |
| C.     | iii. $\overline{A + B}$ |
| D.     | iv. $\overline{A + B}$  |

- |    | A   | B  | C  | D   |
|----|-----|----|----|-----|
| a) | iii | i  | iv | ii  |
| b) | ii  | i  | iv | iii |
| c) | iii | iv | i  | ii  |
| d) | ii  | iv | i  | iii |

2. Which statement BEST describes the operation of a negative-edge-triggered D flip-flop? CO1 [K<sub>1</sub>]
- a) The logic level at the *D* input is transferred to *Q* on NGT of *CLK*.      b) The *Q* output is ALWAYS identical to the *CLK* input if the *D* input is HIGH.
- c) The *Q* output is ALWAYS identical to the *D* input when *CLK* = PGT.      d) The *Q* output is ALWAYS identical to the *D* input.
3. Which one of the following addressing mode cannot be used in 8085 ? CO2 [K<sub>1</sub>]
- (1) Direct addressing      (2) Base Register addressing  
(3) Register Indirect addressing      (4) Indexed addressing
- a) 1,3      b) 3,4  
c) 1,2      d) 2,4
4. How many buses are connected as part of the 8085A microprocessor? CO2 [K<sub>1</sub>]
- a) 2      b) 3  
c) 5      d) 8
5. Assertion (A) : Data are stored in hexadecimal on computers. CO3 [K<sub>2</sub>]  
Reason (R) : Hexadecimal notation is short compared to binary.
- a) Both A and R are Individually true and R is the correct explanation of A      b) Both A and R are Individually true but R is not the correct explanation of A
- c) A is true but R is false      d) A is false but R is true
6. Which is the type of cache memory? CO3 [K<sub>1</sub>]
- a) Fully associative cache      b) Direct-mapped cache  
c) Set-associative cache      d) . All of these
7. The correct sequence of priority level of interrupts are CO4 [K<sub>1</sub>]
- (1 ) INTR    (2) TRAP    (3) RST 7.5    (4) RST6.5
- a) 2-3-4-1      b) 1-3-2-4  
c) 3-4-2-1      d) 4-1-3-2
8. Under which mode of 8255, it will have the following features CO4 [K<sub>2</sub>]
- (i) A 5-bit control port is available  
(ii) 3 I/O lines are available at port C
- a) mode 2      b) mode 0  
c) mode 1      d) mode 3

9. Assertion (A): IC 8251 A is a Universal Asynchronous Receiver and Transmitter CO5 [K<sub>2</sub>]  
Reason (R): It can work as a timer.
- a) Both A and R are Individually true and R is the correct explanation of A      b) Both A and R are Individually true but R is not the correct explanation of A  
c) A is true but R is false      d) A is false but R is true
10. Which one of the following is DMA controller? CO5 [K<sub>1</sub>]
- a) 8255      b) 8254  
c) 8237      d) 8253

**PART B (10 x 2 = 20 Marks)**

**(Answer not more than 40 words)**

11. Draw a circuit of a half subtractor. CO1 [K<sub>1</sub>]
12. Convert JK flip flop to T flip flop. CO1 [K<sub>2</sub>]
13. Name single instruction of 8085 which gives a left shift to the contents of accumulator. CO2 [K<sub>2</sub>]
14. Define Instruction cycle and T state. CO2 [K<sub>1</sub>]
15. Specify the contents of the accumulator and status of flags when following instructions are executed. CO3 [K<sub>3</sub>]  
MVI A, B7H  
ORA A
16. Write the difference between counter & Timers CO3 [K<sub>2</sub>]
17. Write instructions to initialize the 8279 in a given mode. CO4 [K<sub>3</sub>]
18. Give the BSR mode format of 8255. CO4 [K<sub>2</sub>]
19. Define Baud rate. CO5 [K<sub>2</sub>]
20. Write two real time applications of Microprocessors. CO5 [K<sub>1</sub>]

**Answer any FIVE Questions:-**

**PART C (5 x 14 = 70 Marks)**

**(Answer not more than 300 words)**

**Q.No. 21 is Compulsory**

21. (i) Implement the half adder and full adder circuits using only NAND gates (7) CO1 [K<sub>2</sub>]  
(ii) With the help of R-2R binary ladder, explain the working of a 4-bit D/A converter (7) CO1 [K<sub>2</sub>]

22. With neat block diagram, Explain about the architecture of 8085 microprocessor. CO2 [K<sub>2</sub>]
23. (i) Write an assembly language program to add two 16 bit numbers using 8085. (7) CO3 [K<sub>4</sub>]  
(ii) Explain the various classifications of 8085 interrupts (7) CO3 [K<sub>2</sub>]
24. List the major components of 8279 keyboard display Interface and Explain their functions. CO4 [K<sub>3</sub>]
25. (i) Draw and explain the functional block diagram and steps involved in master and slave mode of DMA controller. (10) CO1 [K<sub>2</sub>]  
(ii) Realize a T Flip Flop using SR Flip Flop (4) CO1 [K<sub>5</sub>]
26. Explain the appropriate command words and initialization sequence to program 8259A in the following priority modes: CO4 [K<sub>3</sub>]  
a. Fully nested mode  
b. Polling method  
c. Specific rotation mode  
d. Special maskable mode
27. Discuss the concepts in temperature monitoring system with suitable program in 8085 CO5 [K<sub>4</sub>]

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