ST. ANNE'S

COLLEGE OF ENGINEERING AND TECHNOLOGY

(An ISO 9001:2015 Certified Institution)

Anguchettypalayam, Panruti – 607106.

QUESTION BANK

PERIOD: JULY - NOV 2018 **BATCH**: 2016 – 2020

BRANCH: ECE **YEAR/SEM:** III/V

SUB CODE/NAME: EC6504 MICROPROCESSORS AND MICROCONTROLLERS

UNIT – I 8086 MICROPROCESSOR

PART A

1. Define stack? [D]**[Apr/May 2018]**
2. List the various addressing modes of 8086? [D]**[Apr/May 2018]**
3. The offset address of a data is (341B) and the data segment register value is (123A). What is the physical address of the data? **[ID] [Apr/May 2017]**
4. Define stack register? [D]**[Apr/May 2017]**
5. List the modes of operation in 8086? **[D][Nov/Dec 2017]**
6. Define macros? **[D][Nov/Dec 2017]**
7. Define stack? [D] **[May/Jun 2016]**
8. List the flags of 8086 microprocessor. **[D][Nov/Dec 2016]** [D] **[May/Jun 2016]**
9. List the segment registers of 8086. **[D][Nov/Dec 2016]**
10. List the addressing modes of 8086? Give examples?[D] **[May/Jun 2015]**
11. Write about the different types of interrupts supported in 8086. [D] **[May/Jun 2015]**
12. Calculate the physical address, when segment address is 085H and effective address is 4537 H? **[D][Nov/Dec 2015]**
13. Show how the 2 byte INT instruction cn be applied for debugging? **[D][Nov/Dec 2015]**
14. State the different data transfer schemes. **[D][Nov/Dec 2016] [reg 2008]**
15. What are the advantages of memory-mapped I/O over I/O -mapped I/O? **[D][Nov/Dec 2016] [reg 2008]**
16. What is direct memory access? [D]**[Apr/May 2017] [reg 2008]**
17. List the, flags in 8086 and state its functions. [D]**[Apr/May 2017] [reg 2008]**
18. When the 8086 processor is in minimum mode and maximum mode? [D]**[May/Jun 2016] [reg 2009]**
19. What is an assembler? [D]**[May/Jun 2016] [reg 2009]**
20. What is the purpose of segment registers in 8086? [D]**[Apr/May 2015] [reg 2009]**
21. List the addressing modes of 8086?give examples **[May/June 2015], [May/Jun 2014]**
22. Write about different types of interrupts supported in 8086 [D]**[May/Jun 2015]**
23. What is the processing element inside the microprocessor? What process it does? [ID]**[Nov/Dec 2014]**
24. How many memory locations can be addressed by 8086 microprocessor? [D]**[Nov/Dec 2014]**
25. If the stack segment register contains 3000H and the stack pointer register contains 8434H, what is the physical address of the top of the stack? [ID]**[Nov/Dec 2014]**
26. Give the operation of CBW and TEST instructions of 8086? [D]**[Nov/Dec 2013]**
27. What is the function of parity flag? [D]**[Nov/Dec 2013]**
28. How 16-Bit address is converted into 20-Bit address in 8086? [ID]**[Nov/Dec 2013]**
29. Name the hardware interrupts of 8086. [D]**[May/Jun 2013]**

30. What address in the interrupt vector table, are used for a Type-2 interrupt in 8086? [D]**[Nov/Dec 2012]**
31. Why do we use macros? [D]**[Nov/Dec 2012]**
32. What are called assembler directives? Give two examples.[D] **[May/Jun 2012]**
33. What is BIOS function call in 8086 Microprocessor?[D] **[May/Jun 2012]**
34. Explain the coordination between BIU and EU. [D]
35. Draw the 8086 flag register format. [D]**[REJINPAL]**
36. List the pointer and index registers of 8086 architecture.[D]**[Nov/Dec 2016]**
37. Identify the addressing modes involved in the following 8086 instructions:

MOV AX, 0005H; MOV AX, 50H [BX][SI]. [D]**[REJINPAL].**

38. Give the significance of Interrupt flag in 8086 processor. [D]
39. Give a note on the use of auxiliary carry flag. [D]
40. What do you mean by Non Maskable Interrupt? [REJINPAL] [D]
41. List the different flags affected by the arithmetic and logic operations. [ID]

PART B

[First Half]

[Introduction to 8086 – Microprocessor architecture]

1. Draw and explain the architecture of 8086 with neat diagram. (13) [D]**[Apr/May 2017, Apr/May 2018] , Nov/Dec 2017, Apr/May 2017 (reg 2009)]** [D]**[May/Jun 2016] [reg 2009] [D][Nov/Dec 2016] [reg 2008] [D][Nov/Dec 2016]**
2. What are the differences between memory mapped I/O and I/O mapped I/O? (6) [**Apr/May 2017 (reg 2009)]**
3. Describe in detail with neat diagram the Pin Configuration of the 8086 Processor with its functions. (13) [**Apr/May 2015 (reg 2009)]**
4. Explain the bus interface unit and execution unit of 8086 microprocessor.(8) **[ID] [Nov/Dec 2014][May/June 2015]**
5. Explain the register organization of 8086 processor in detail. (8) [D]
6. Draw the internal architecture of 8086 microprocessor and explain its Bus Interface Unit (BIU). [8]
7. Explain the bus interface unit and execution unit of 8086 microprocessor. [8]**[Nov/Dec 2014][May/June 2015]**

Addressing modes:

8. Explain any 8 addressing modes of 8086 processor with an example. (13) [D] **Apr/May 2018]**
9. Explain the various addressing modes of 8086 microprocessor with suitable examples (13)**[D][Nov/Dec 2016]**

Instruction set

10. Explain various instructions set available in 8086 with an example? [D][13]

[Second Half]

[Assembler directives – Assembly language programming – Modular Programming - Linking and Relocation - Stacks - Procedures – Macros — Byte and String Manipulation.]

1. Write a program to convert BCD data to binary using 8086 ALP (8) [**D] [May/Jun 2015]**
2. Write an 8086 assembly language program to get an input from the keyboard for 2 digits and convert that input into a hexadecimal number using BIOS int. [8]
3. Write an 8086 assembly language program to multiply 2 digit numbers by getting an input from the keyboard using BIOS interrupt call. (8) [ID] **[May/Jun 2014]**
4. Write an 8086 ALP to sort out any given 10 numbers in ascending and descending order.[10]

[Nov/Dec 2013]

5. Write a program to find the average of ten numbers.**[8] [May/Jun 2013]**
6. Write a program to divide two 8-Bit numbers.**[4] [May/Jun 2013]**
7. Explain about the following assembler directives: END P, EQU, EVEN, EXTRN with examples.**[8] [May/Jun 2013]**
8. What are the assembler directives and pseudo ops? **[4] [May/Jun 2013]**
9. Give an example for the 8086 instructions: AAA, CWD, JNBE, LAHF, MOVS, RCL, ROL and SAHF. **[8] [Nov/Dec 2012]**
10. What is the use of the following assembler directives: DD. ENDS, EVEN and EXTRN. [8]
11. Explain how to pass parameters to macros. [8] **[May/Jun 2012]**
12. Write an 8086 assembly language program to read in 100 samples of data at 1-ms intervals. [8] **[May/Jun 2012]**
13. Explain the role of the following.[1] Address Conversion Mechanism [2] Instruction Queue
14. Describe the action taken by 8086 when INTR pin is activated. [6]
15. Write an assembly language program in 8086 to search the largest data in an array.[10]
16. Explain the following assembler directives used in 8086 [1] ASSUME [2] EQU [3] DW [6]
17. Write a program to find the number of positive numbers and negative numbers in a given series of signed numbers using 8086.
18. Explain the following assembly directives: SHORT, TYPE, FAR PTR

Interrupts and interrupt service routines

19. Describe the interrupts of 8086 and its types with service routine. (13) [D]**[Apr/May 2017, Nov/Dec 2017]**
20. How the interrupt vector is handled in 8086? (8) (6) [**Apr/May 2017 (reg 2009)]**
21. Draw and discuss the interrupt structure of 8086. (13) **[D][May/Jun 2014],**
22. Discuss interrupt handling process in 8086 (7) **[D][May/ Jun 2015]**
23. Explain the interrupt structure of an 8086 microprocessor with 8086 interrupt pointer table.[8]
24. Explain the 8086 Interrupt types with an example. [8] **[Nov/Dec 2012] Apr/May 2018]**
25. Discuss the different types of interrupts in 8086. (6) **[D][Nov/Dec 2016] [reg 2008]** [D]**[May/Jun 2016] [reg 2009]**
26. Describe how memory is accessed in 8086 with suitable diagram. (7) **[D][Nov/Dec 2016] [reg 2008]**
27. Write a short note about assembler directives. (4) **[D][Nov/Dec 2016]**

UNIT II THE 8086 SYSTEM BUS STRUCTURE

PART A

1. List two differences between maximum and minimum mode configuration of 8086? [D]**[Apr/May 2018]**
2. What is meant by multiprogramming? [D]**[Apr/May 2018]**
3. What is meant by multiprogramming? [D] **[Apr/May 2017]**
4. Write some example for advanced processor? [D]**[Apr/May 2017]**
5. What is the need of LOCK signal? [D]**[Nov/Dec 2017]**
6. Write some example for advanced processors? [D]**[Nov/Dec 2017]**
7. Differentiate internal and external bus? [D] **[May/Jun 2016]**
8. Compare closely coupled and loosely coupled configuration? [D] **[May/Jun 2016]**
9. Define machine cycle. [D]**[Nov/Dec 2016]**
10. Define. Bus. [D]**[Nov/Dec 2016]**
11. Define Bus? why bus request and cycle stealing are requested? [D] **[May/Jun 2015]**

12. Draw the read cycle timing diagram for minimum mode? [D] **[May/Jun 2015]**
13. What is multiprogramming? **[D][Nov/Dec 2015]**
14. Schematically show how synchronization is made between 8086 and its coprocessor? **[D][Nov/Dec 2015]**
15. What is direct memory access? **[D]** [**Nov/Dec 2014]**
16. State the significance of LOCK signal in 8086? **[D]** [**Nov/Dec 2009]**
17. What are the Bus allocation strategies available? **[ID]**
18. What are the functions of status pins in 8086? **[D]**
19. Mention the advantages of using the Direct Memory Access. **[D]** [**Nov/Dec 2010]**
20. What is the use of MN/MX Pin in 8086. **[D] [REJINPAL]**
21. Draw the read cycle timing diagram of 8086. **[D] [April/May 2015]**
22. Give the functions of READY and TEST pins of 8086. **[D] [REJINPAL]**
23. When the 8086 processor is in minimum mode and maximum mode? **[D] [April/May 2011]**
24. What is the Minimum mode of 8086? **[D]**
25. What is the Maximum mode of 8086? **[D] [April/May 2012]**
26. Draw the diagram for co-processor configuration. **[D]** [**Nov/Dec 2012]**
27. Name the signals used by the processor to communicate with an I/O processor. **[D]**
28. What are the signals involved in memory bank selection in 8086 microprocessor? **[ID] [April/May 2010]**
29. What are tightly coupled systems or closely coupled systems? **[D] [REJINPAL]**
30. What are loosely coupled systems? **[D] [REJINPAL]**
31. Write some advantages of loosely coupled systems over tightly coupled systems **[D]** [**REJINPAL]**
32. Write some disadvantages of loosely coupled systems **[D]**
33. What are the multi microprocessor configuration methods? **[D]**
34. Define Machine cycle? **[D] [Nov/Dec 2016]**
35. What is independent bus request scheme? **[D]**
36. How DMA is initiated? **[D] [Nov/Dec 2016]**
37. What is Multiprogramming? **[D] [Nov/Dec 2015]**
38. Mention the Bus Allocation Schemes. **[D] [REJINPAL]**
39. What are the three basic Multiprocessor Configurations that the 8086 can support? **[D] [REJINPAL]**
40. Define bus. Why bus request and cycle stealing are required? **[D] [April/May 2015]**
41. Compare closely coupled and loosely coupled configurations? **[D][May/June 2016]**
42. Schematically show, how the synchronization is made between the 8086 and its co-processor. **[ID][Nov/Dec 2015]** [REJINPAL]

PART B

[First Half]

[8086 signals – Basic configurations – System bus timing –System design using 8086 – IO programming – Introduction to Multiprogramming – System Bus Structure]

1. Draw and explain the timing diagram of write cycle in 8086 in minimum mode. (7) [**Apr/May 2017 (reg 2009)]**
2. Explain the system bus structure of 8086. Draw the timing diagram for interrupt acknowledgement cycle? (13) **[Apr/May 2017]**
3. Explain the system bus structure of 8086. Draw the timing diagram for interrupt acknowledgment cycle. (13) [D]**[Nov/Dec 2017]**
4. Explain in detail about the system bus timing of 8086/8088. (13) [D]**[Nov/Dec 2016]**

5. With a neat sketch describe the Minimum and Maximum mode of operation of 8086. (13)[D]**[April/May 2015]**
6. Discuss the maximum mode configuration of 8086 by with a neat diagram. Mention the functions of various signals. (13)**[April/May 2014] [D][REJINPAL]**
7. Describe the maximum mode signals, bus cycles and maximum mode system configuration of 8086 microprocessor in detail. (13)[D]**[REJINPAL]**
8. How does one configure 8086 in Minimum and Maximum mode? Explain? (13) [D]**[Nov/Dec 2011] Apr/May 2018]**
9. Discuss in detail the various signals of 8086. (8)[D]
10. Explain in detail about the system bus timing of 8086. (13)[D]**[May/June 2016] [Nov/Dec 2016]**
11. Explain in detail about 8086 memory banks and associated signals for byte and word operations.(13) **[D]**
12. What are the peripheral I/O instructions? Write its syntax and explain the same with the timing diagram.[8][D] **[Nov/Dec 2010]**
13. Explain about System Bus Structure with suitable timing diagram. [13][D]**[REJINPAL]**
14. Explain the 8086 bus structure with a neat sketch.[13] [D]**[Nov/Dec 2010]**
15. Discuss in detail about Interrupt Priority Management.[13] [D]**[Nov/Dec 2015]**

[Second Half]

Multiprocessor configurations – Coprocessor, – Introduction to advanced processors]

1. Discuss about the multiprocessor configurations of 8086. (13) [D]**[Nov/Dec 2016] Apr/May 2018]**
2. Explain the various multiprocessor configurations. [13][D]**[REJINPAL][Nov/Dec 2016]**
3. Discuss the principle and operations of co-Processor Configuration. [13][D]**[Nov/Dec 2015] [REJINPAL]**
4. Explain in detail about the different inter connection topologies in multiprocessor systems. [13[ID]
5. Write a assembly language program to check whether the given string is palindrome or not. [D]**[April/May 2015]**
6. Explain the following: (i) Multiprocessor system. (4) (ii) Coprocessor (4) (iii) Multiprogramming (4) (iv) Semaphore (4) **[May/June 2016] [REJINPAL]**
7. Write briefly about the Direct Memory Access. (4) **[April/May 2011]**

Closely coupled and loosely Coupled configurations

8. Explain the loosely looped configuration with neat diagram? (13) [D]**[[Apr/May 2017] Nov/Dec 2017]**
9. Explain in detail about Closely Coupled Configuration. Mention the Advantages and Disadvantages of the same. [7] [D]**[April/May 2015]**
10. Explain loosely coupled system with block diagram and list its advantages. [7] [D]**[April/May 2015]**
11. Define loosely coupled system. Explain the schemes used for establishing priority.[7] [D] **[Nov/Dec 2015]**
12. Compare closely coupled configuration with loosely coupled configuration**. [5][D][April/May 2015] [REJINPAL]**

UNIT III I/O INTERFACING

PART A

1. Give the various modes of 8254 timer? [D]**[Apr/May 2018]**
2. Write a 16 bit delay program of 8254 timer? [D]**[Apr/May 2018]**
3. Draw the format of read back command register, of 8254[D]**[[Apr/May 2017]**
4. What are the handshake signals used in Mode -2 configurations of 8255? [D]**[Nov/Dec 2017]**
5. How the DMA operation performed with 8086? [D]**[Nov/Dec 2017]**
6. What is key bouncing? [D] **[May/Jun 2016]**
7. List out the advantages and disadvantages of parallel communication over serial communication? [D] **[May/Jun 2016]**
8. How DMA is initiated? [D]**[Nov/Dec 2016]**
9. What is the drawback of memory mapped I/O? [D]**[Nov/Dec 2016]**
10. Give the various modes and applications of 8254 timer? [D] **[May/Jun 2015]**
11. Draw the block diagram of alarm controller with 8086 s processor? [D] **[May/Jun 2015]**
12. Mention the number of register banks their addresses in 8051? **[D][Nov/Dec 2015]**
13. What frequency transmit clock (TxC) is required by an 8251 in order for it to transmit data at 4800 baud with a baud rate factor of 16? **[D][Nov/Dec 2015]**
14. What is sample -and -hold circuit? [D]**[Nov/Dec 2016] [reg 2008]**
15. State the applications of programmable interval timer. [D]**[Nov/Dec 2016] [reg 2008]**
16. What do you mean by sample -and -hold circuit? [D]**[[Apr/May 2017]**
17. List the major functions performed by CRT interface. [D]**[[Apr/May 2017]**
18. What is the various programmed data transfer method? [D]**[[Apr/May 2015] [reg 2008]**
19. Give the different types of command words used in 8259A. [D]**[[Apr/May 2015] [reg 2008]**
20. List the modes and applications of 8254 timer. [D] **[May/Jun 2015, 2012]**
21. Draw the block diagram of alarm controller with 8086 as processor. [D] **[May/Jun 2015]**
22. What are the advantages of Programmable Interval Timer/Counter IC? [D] **[May/Jun 2014**
23. What is bus stealing? [ID] [**Nov/Dec 2013]**
24. What are the operating modes of 8255? [D] **[Nov/Dec 2013]**
25. What are the requirements to be met while interfacing memory or I/O devices to 8085 processor? [D] **[May/Jun 2013]**
26. What are the modes of operation of 8237? [D] **[May/Jun 2013]**
27. What is the function of LOCK and RQ/GT signals? [D] **[May/Jun 2013]**
28. How to change the direction of the stepper motor from clockwise direction to anticlockwise direction using a program segment. [D] **[Nov/Dec 2012]**
29. Mention any two applications that use ADC and DAC. [D]
30. What are the steps in interfacing peripherals with the microprocessor? [D]
31. What are the differences in interfacing RWMs while 8086 is in minimum and maximum modes? [D] [**REJINPAL]**
32. State the use of cascading signals of 8259 programmable interrupt controller. [D]
33. State the role of In-service register of 8259 interrupt controller. [D]
34. What are the operating modes of 8253? [D] [**REJINPAL]**
35. What is the use of IRR [Interrupt Request Register? [D] **[Nov/Dec 2016]**
36. What does it imply if 8259's ICW1 bit fields LTIM and SNGL bits are set to zero? [D]
37. What is key bouncing? [D]
38. List the uses of USART. [D] **[REJINPAL]**
39. List the features of 8251. [D]
40. List the functions performed by 8279.[**Nov/Dec 2016]** [D]
41. What is the function of gate signal in 8254 timer? [D]

42. Write the format of ICW1 in 8259. **[REJINPAL]** [D]
43. Name the two modes used by the DMA processes to transfer data. [D]
44. Name the six modes of operations of an 8253 programmable interval timer. [D]
45. Using two 8259-interrupt controllers what is the maximum number of peripherals that can be provided with interrupt facility. **[REJINPAL]** [D]

PART B

[First Half]

[Memory Interfacing and I/O interfacing]

D/A and A/D Interface:

1. Explain the procedure of interfacing D/A and A/D converter circuit. (13)[D]**[Nov/Dec 2016]**
2. Draw a block diagram to .interface a Analog to Digital Converter (ADC) with a microprocessor and explain its working. (8) [D]**[[Apr/May 2017] [reg 2008]**

Serial communication interface:

3. Draw and explain the functional diagram of 8251. (13) [D]**[Nov/Dec 2017] Apr/May 2018]**

Timer:

4. With a neat block diagram explain programmable interval IC 8253 (13)[D]**[Nov/Dec 2016] [reg 2008]**
5. Write notes on Programmable Interval Timers 8253 and 8254. (8) [D]**[[Apr/May 2017] [reg 2008]**

Parallel communication interface

6. Draw and explain the functional diagram of parallel communication interfacing chip. (13) [D]**[[Apr/May 2017]**
7. Explain the function of Programmable Peripheral Interface – Intel 8255. (8) [D]**[[Apr/May 2017] [reg 2008]**
8. Using model, write a program to communicate between two 8086 microprocessors using 8255. (10) (7)[D]**[May/ Jun 2016] [reg 2008]**
9. Show the control word format of 8255 and explain how each bit is programmed. (8)[)[D]**[May/ Jun 2016] [reg 2008]**
10. With neat block diagram explain the 8255 Programmable Peripheral Interface and its operating modes.(13) [D]**[[May/ Jun 2017] [reg 2008]**

[Second Half]

[Keyboard/display controller – Interrupt controller –-Programming and applications Case studies: Traffic Light control, LED display, LCD display, Keyboard display interface and Alarm Controller]

1. Draw a schematic to interface keyboard and display with 8085 using 8255 and explain. (8) [D]**[[Apr/May 2017]**
2. Write a program to interface LED and LCD displays with 8086 Microprocessor. [13][D]
3. Draw and explain functional diagram of keyboard and display controller. (13) [D]**[Nov/Dec 2017] [[May/ Jun 2017] [reg 2008]**
4. With a neat block diagram explain the key board and display controller IC 8279. (13)

Interrupt controller:

5. With neat block diagram, explain the description and functions of 8259.[13] [D]**[Nov/Dec 2016] [reg 2008]**

DMA controller:

6. Explain in detail about DMA controller. (13) [D]**[Nov/Dec 2016] Apr/May 2018]**
7. Explain the need of DMA controller with its functional diagram. (13) [D]**[[Apr/May 2017]**

UNIT IV MICROCONTROLLER

PART A

1. Which port used as multifunction port? List the signals. **[Apr/May 2017]**
2. Illustrate the CJNE instruction. **[Apr/May 2017]**
3. How to set 8051 in idle mode? **[Nov/Dec 2017]**
4. Illustrate the DJNZ instruction? **[Nov/Dec 2017]**
5. Draw the diagram of processor status word in 8051. [D] [**May/Jun 2015**
6. How do you select register bank in 8051 [D] **[May/Jun 2015].**
7. Compare the features of microprocessor and microcontroller. [D] [**Nov/Dec 2014**
8. What are the differences between the microprocessor and microcontroller? [D] [**May/Jun 2014]**
9. What is the significance of EA line of 8051 microcontroller? [D] **[May/Jun 2014]**
10. What is the difference between MOVX and MOV? [D] **[Nov/Dec 2013]**
11. What is Baud rate for mode 0 operation of the serial port of 8051? [D] **[May/Jun 2013]**
12. In the program status word of 8051, the bits RS0 and RS1 are 1 and 0, then which register bank is selected for operation? [D] **[May/Jun 2013]**
13. Why are the port lines of programmable port devices automatically put in the input mode when the device is first powered-up or reset? [D] **[Nov/Dec 2012]**
14. What is the size of the on-chip program memory and on-chip data memory of 8051 microcontroller? [D] **[May/Jun 2012]**
15. List the features of the parallel ports of 8051 microcontroller. [D]
16. What are the advantages of using a microcontroller in place of a microprocessor? [D]
17. What are the functions of the following signals of 8051? ALE/PROG, PSEN
18. List the applications of a microcontroller. [D]
19. Define XTAL1 and XTAL2. [D] **[REJINPAL]**
20. What do you mean by Indirect Addressing Mode? [D]
21. What is the function of DPTR register? [D] **[REJINPAL]**
22. What is the possible branching range when an AJMP/ACALL of 8051 instruction is executed? [D]
23. How does the status of EA pin affect the access to internal and external program memory? **[REJINPAL]** [D]
24. State the difference between RET and RET1 instruction in 8051. [D]
25. What are register banks in 8051 microcontroller? [D] **[REJINPAL]**
26. Differentiate RRA and RRCA instruction in 8051 microcontroller. [D]
27. Draw the format of PSW of 8051. [D]
28. What is SFR? [D] **[REJINPAL]**
29. How does 8051 differentiate between external and internal program memory? [D]
30. What is the function of GATE bit in the TMOD register of 8051? [D]
31. Explain the function of following pins of 8051 microcontroller. a. PSEN [D]
32. What are the addressing modes supported by 8051? [D]
33. Which of the following are illegal? **[REJINPAL]** [D]

A] ADD R3, #50H

B] ADD A, #50H

C] ADD R7, R4H

D] ADD A,#255H

E] ADD A ,R5.

34. What is jump range? **[D][Nov/Dec 2015]**
35. Mention the number of registers and addresses is 805? [D][Nov/Dec 2015]
36. What are the different types of operands addressing in 8051? [D] [May/Jun 2016]
37. Write an 8051 ALP to toggle PI a total of 200 times .use RAM location 32H to hold your counter value instead of R0-R7? [D] **[May/Jun 2016]**
38. Draw the pin diagram of 8051? [D]**[Apr/May 2018]**
39. What are bit manipulation instructions? Give two examples. [D]**[Apr/May 2018]**

PART B

[First Half]

[Architecture of 8051]

1. Describe the architecture of 8051 with neat diagram? (5) [D] **[Nov/Dec 2017] Apr/May 2018]** [D] [**Nov/Dec 2016] [May/Jun 2015,May/Jun 2016]** [**May/Jun 2012]**] [**Jun 2015,Nov/Dec 2014**
2. Draw the functional block diagram of 8051 microcontroller and explain each block. [8] [ID]
3. Draw the pin diagram of 8051 Microcontroller and explain the Input /Output lines in detail.[8] [ID] **[May/Jun 2014]**
4. Explain the features of 8051 microcontroller and compare it with 8086 microprocessor. Write short notes on register set of 8051 micro controller.[13] [D]

Special Function Registers (SFRs)

5. Write the available special function registers in 8051. Explain each register with its format and functions. (13) []D**[Apr/May 2017]**
6. Explain the internal data memory structure of 8051 microcontroller with its SFRs. [8] [D] [**Nov/Dec 2012]**
7. Bring out the features of Special Function Registers of 8051 microcontroller. [7][D]

I/O Pins Ports and Circuits

8. Discuss the ports and its circuits of 8051? (13) [D] **[Nov/Dec 2017]**
9. Draw the data memory structure of 8051 microcontroller and explain. [8] [D] [**Nov/Dec 2014]**
10. Describe the 8051 I/O port structure.[6] [D] Explain the internal and external data memory organization of 8051.[10] [D] **[Nov/Dec 2013]**
11. Describe the functions of the signals present in 8051.[10] [D] **[May/Jun 2013]**
12. With a neat sketch of a Schematic diagram, explain the functions of various signals of 8051.[10] [D]
13. Draw and explain the functions of bits in TMOD and TCON registers of 8051.[10] [D] **[May/Jun 2015]**
14. Explain how 8051 distinguishes between internal and external ROMs.[6] [D]

[Second Half]

[Instruction set - Addressing modes - Assembly language programming]

1. Discuss the types of addressing mode with suitable example in 8051. (8) [D] **[Apr/May 2017]**
2. Write an 8051 assembly language program to multiply the given number 48H and 30H. [D]
3. Write a program to find the number of positive and negative numbers in an array. [D]
4. Write a program to generate Fibonacci series. [D]
5. Write a program to find out the smallest number in an array. [D]
6. Write an 8051ALP to create a square wave of 66 % duty cycle on bit 3 of port 1. (13**)** [D] **[May/Jun 2016]**
7. Write a program to bring in data in serial form and send it out in parallel form in 8051(6) [D] **[MayJun 2015]**
8. Explain about arithmetic and control instruction set of 8051(10)[D] **[MayJun 2015]**

UNIT V - INTERFACING MICROCONTROLLER

PART A

1. What are the types of sensors used for interfacing?
2. Give the priority level of the interrupt sources in 8051?
3. List the 8051 interrupts with its priority. [D] **[Apr/May 2017]**
4. What are the types of sensors used for interfacing? [D] **[Apr/May 2017]**
5. List the 8051 interrupts with its priority? [D] **[Nov/Dec 2017]**
6. Give two examples of sensors and state its uses? [D] **[Nov/Dec 2017]**
7. Define baud rate of 8051? [D] **[May/Jun 2016]**
8. Compare polling and interrupt? [D] **[May/Jun 2016]**
9. Differentiate between timers and counters. Draw the diagram of TCON IN 8051. [D] **[May/June 2015]**
10. Which register is used for serial programming in 8051, illustrate it. [ID] **[May/June 2015]**
11. Mention the features of serial port in mode 0? **[D][Nov/Dec 2015]**
12. How A/D convertor is is interfaced with 8051? **[D][Nov/Dec 2015]**
13. What is the necessity to interface DAC with microcontroller? [ID] **[Nov/Dec 2014]**
14. What is difference between watch dog timer and ordinary timer? [ID] **[Nov/Dec 2013]**
15. What is the need for de-bouncing the keyboard? [D] **[Nov/Dec 2012]**
16. What is the use of 'Vref' pin in the ADC? [D] **[Nov/Dec 2012]**
17. How do you calculate baud rate for serial communication for 8051? [D]
18. Draw the interfacing diagram of LCD with 8051 controller. [D]
19. Sketch the control word for Programmable timer. [D]
20. Write about DMA controller. [D]
21. Write the BSR control word of 8255 to set bit 0 of port C. [D]
22. Define PPI. [D]
23. Write the various interrupts supported by 8051 with priority level and vector address. [D]
24. Draw the data format used while asynchronous serial data transmission/reception is done using 8251. [D] **[Rejinpal]**
25. What is the internal operating frequency of the 8279? How can you derive it from any available clock signal? [D] **[Rejinpal]**
26. Draw the command word format for 8251. [D]
27. Specify the bit of a control word for the 8255.Which differentiates between I/O mode and BSR mode? [D] **[Rejinpal]**
28. Specify the two types of serial communication. [D]

29. List out various applications of microcontroller? [D]
30. Differentiate between timers and countess in 8051?[D]
31. Define baud rate of 8051?[D]
32. What is the function of SM2 bit in the SCON register of 8051?[D]

PART B

[First Half]

Programming 8051 Timers - Serial Port Programming - Interrupts Programming

1. Illustrate the serial communication in 8051, with its special function register? (13) **[Nov/Dec 2017]**
2. Describe about serial port interface of 8051.[4] **[May/Jun 2013]**
3. Explain 8051 serial port programming with examples. (16) **[May/Jun 2016]**
4. What is timer/counter? Explain the 16-bit timer mode and 8-bit auto-reload mode of 8051microcontroller. [8] **[Nov/Dec 2012]**
5. Describe the different modes of timers/ counters operation of 8051 microcontroller [16]**[Nov/Dec 2016]**
6. How to transfer data between a PC and microcontroller using serial communication? Draw the necessary diagrams and explain. [8] **[Nov/Dec 2012]**
7. Program the on-chip timer in 8051 to be an event counter. Use model and display the binary count on P1. Set the initial count to be Zero. [8]

LCD & Keyboard Interfacing

8. How to interface and display an LCD with microcontroller? [8]
9. How do you interface 8051 microcontroller with keyboard? Explain in detail.[8]
10. Write a program to interface a sensor device with 8051 microcontroller. **[Rejinpal**
11. How to interface an LCD display with microcontroller? Explain how to display a character using LCD display. [8] **[May/June 2015,Nov/Dec 2014]**
12. Explain how an LCD and keyboard is interfaced with 8051.[10]
13. Discuss briefly about keyboard/display controller.[16] **[May/Jun 2013]**
14. Discuss briefly about keyboard/display controller.[16] **[May/Jun 2013]**
15. Draw the circuit diagram to interface an LCD with microcontroller and explain how to display the data using LCD. [8] **[May/Jun 2012]**
16. Draw the circuit diagram to interface a keyboard with microcontroller and explain how microcontroller recognizes the key-press. [8] **[Rejinpal]**

[Second Half]

[ADC, DAC & Sensor Interfacing - External Memory Interface-

1. Write a program for generation of unipolar square waveform of 1 KHz frequency using Timer O of 8051 in mode0. Consider the system frequency as 12MHz. **[Apr/May 2017]**
2. Interface the ADC convertor with 8051 and explain with neat diagram? (6) **[Nov/Dec 2017]**
3. Write the assembly language program to execute the ADC conversion? (7) **[Nov/Dec 2017]**
4. Explain the interrupt structure of 8051 microcontroller with suitable diagrams. [8] **[Nov/Dec 2014]**
5. Vin=2.25 V, Vref=5V, Number of data lines are 5. Convert the given analog quantity into its equivalent output digital quantity. [8]
6. Explain the different techniques to convert a digital quantity into its equivalent analog quantity. [8] **[May/Jun 2014]**
7. How do you interface 8051 microcontroller with an ADC? Explain.[8] **[Nov/Dec 2013]**
8. How a DAC is interfaced with 8051?[6] **[May/Jun 2013]**

9. Write brief notes on ADC and DAC along with their interface details.[8]
10. Write a program to generate the square, triangular and trapezoidal waveforms using 8051 microcontroller. [13]**[Rejinpal]**

Stepper Motor and Waveform generation

11. Draw a diagram to interface a stepper motor with 8051 microcontroller and explain. Write a program to make the stepper motor to rotate both clockwise and anticlockwise directions. [15] **[May/Jun 2015] Apr/May 2018] [Apr/May 2017]**

    [OR]

    Draw a diagram to interface a stepper motor with 8051 microcontroller and explain. Write a program to make the stepper motor to rotate both forward and reverse directions with delay. [13] **[Nov/Dec 2016,May/Jun 2016]**
12. Draw and explain the block diagram of alarm controller? [15] [D]**Apr/May 2018]**
13. Draw the block diagram of traffic light control system using 8086. Write the algorithm and ALP for Traffic light control system. [15] [D]**Apr/May 2018]**

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