1. Write a program to rotate the left the data byte 84H four times.

PROGRAM STATEMENT

To write an assembly language program to rotate milest the data byte 84H four times.

PROGRAM ANALYSIS

ALGORITHM;

STEP 1: Load the data byte 84H into accumulator.

STEP 2! Rotate left accumulator for four times

STEP 3: Store the content of accumulator in output port OSH.

STEP 4: Terminate the program.

ASSEMBLY LANGUAGE CODE

MVIA, 84H // Load the data byte 84H into accumulate

RLC // Rotate Left Accumulator

RLC

RLC

RLC

OUT 056H // Store the result of accumulator into output post 054

HLT // Terminate the pragram.

Japut

A = 84 1H

Output

Output port, OSH -> 48H

2. Covite a program to rotate right the data byte F7H into two times

PROGRAM STATEMENT

To write an assembly longuage program to rotate right the data byte F7H two times.

PROGRAM ANALYSIS

ALGORITHM:

STEP 1: Load the data byte F7H into accumulator

STEP 2: Rotate accumulator right 2 times.

STEP 3: Store the content of accumulator in output port

ASSEMBLY LANGUAGE CODE

MIVIA, FAH // Load the data byte FAH into accumulated immediately.

RRC 1 Rotale accumulator right

RRC // Rotate accumulator right

HLT // Terminate the program.

JNPUT

OUTPUT

A C F7H

Output port, OSH -> FDH

3. Write a program to rotate left with comy the result of addition (AAH + EEH) three times.

PROGRAM STATEMENT

To ask on assembly longuage program to rotate left cum comy the result of addition (MAH+EEH) three times.

PROGRAM ALGORITHM.

ALGORITHM:

STEP I! load the data type AAH into accumulator.

STEP 2: Load The dota type EEH into registers B

STEP 3: Add the content of accumulater and

register B.

STEP 4: Rotate accumulation left cuth comy, four times.

STEP 5! Display the earnesult of accumulator into

output para OSH.

6: Terminate the program.

ASSEMBLY LANGUAGE CODE

MUI A, AAH // Load the data type AAH into accumulator.

B, EEH // Load the data type EEH into register B. MVI

11 Add the content of accumulater and register B. ADD

// Rotale accumulator left with cong. RAL

RAL

RAL

RAL

OUT OSH // Display result of accumulator into autput part OSH

11 Terminate the program. HLT

Input

AC ANH BG EEH

Output

Output port, USH -> (6H

4. Curite a program to rotate right cum comy the result of Subtraction ($DE_H - FR_H$) two times.

PROGRAM STATEMENT

To covere an assembly longuage program to rotate right with corry the result of subtraction (DEH - FAH) two times.

PROGRAM ANALYBIS

ALGORITHM:

STEP 1! Load the data byte DEH into accumulator.

STEP 2: Load the data byte FA'n into register B.

STEP 3! Subtract the content of accumulator with register B

STEP 4! Rotate accumulator right cuitn corry 2 times.

STEP 5: Store the content of accumulator in Output part OSH.

STEP 6! Terminate the program.

ASSEMBLY LANGUAGE CODE

MVI A, DEH // Load the data type Den into accumulator.

MUI B, FAH // Load The data type FAH into regists B.

SUB B // Subtract the content of accumulator and register B.

RAR // Rotate accumulator right cuitn corry

RAIR // Rotake accumulator agent cuits corry

OUT OSH // Store the contrat of accumulates in cutput post
USH

HLT // Terminote the program.

TUGUE

A C DEH

BL FAH

DUTPUT

Output port, OSII -> 7911

J. CUAP to subtract D7H from A9H

If borrow emists, rotate left outn corry five times. Then subtract coith borrow A9H from accumulator's control.

Otherwise terminate.

PROGRAM STATEMENT

To curte on assembly longuage program to subtract D7H from A9H and if borraw emists, rotate left with correy five times. Then subtract cultin borrow A9H from accumulator's contract Otherwise, terminate the program.

PROGRAM ANALYSIS

ALGORITHM:

STEP 1: Load the data byte ABH into accumulator.

STEP 2: Load The data byte D7 H into register B.

STEP3: Subtract the Content of accumulater cuth register B

STEP 4: Check for complowrow), if no carry jump to X

STEPS: Rotate accumulator left cuitn corry for five times.

STEP 6: Store the result on accumulated into mamony location 200011 STEP 71 Terminate the pregram.

ASSEMBLY LANGUAGE CODE

MVIA, AGH // Load the data byte AGH into accumulator.
MVIB, D7H // Load the data byte D7H into register B.

SUBB // Subtract content of accumulator cum registers B.

JNC X // Jump to X if no corry (boxica)

RAL // Rotate accumulator left outh corry

RAL

RAL

RAL

XI STA 2000H // Stare the result of accumulated onto memory location 2000H.

HLT . // Terminate the program.

BE DAH

Output

2000H→ > H

6. CUMP to add two 1-byte instructions integers 84, and Fith. If comy enists, rotate right cuth comy the accumulator result three times. Otherwise terminate.

PROGRAM STATEMENT

To curite an assembly language program to odd two 1-byte integers 84H and F7H. If costy exists, rotate right cuith costy the accumulated result three times. Other cuise terminate the program.

PROGRAM ANALYSIS

ALGORITHM:

STEP I! Load the data integer 84H into accumulator.

STEP 2: Load the data integer F7 H into register B

STEP 3! Add the content of accumulator cuitn register B.

STEP 4: Check for corry, if no corry jump to X

STEP 5! Rotate accumulated right cuitn copy for throughous

STEP 6: Store the result on accumulator into mamory location 2000H

STEP 7! Terminate The Program.

ASSEMBLY LANGUAGE CODE

MVI A, 84H //Load the clata integer 84H into accumulator.

MVIB, F7H // Load the data integer F7H into register B.

ADD B // Add The content of accumulator cuitin segister B.

JNC X // Jump to X if no comy

11 Rotale right accumulater cuth corry RAR

RAR

RAIZ

X: STA 2000H // Store the result of accumulator into memory lucation 2 CCUH.

// Terminate the program. HLT

JNPUT

AC 84H

BE F7H

OUTPUT

2000H→ EFAH

7. Corite a program to subtract CDH from MBH.

If result is negative, express 2's complement result in original diffrence form in register H. Also, some the sign bit in register L. Then COPY H's content to E. Perform necessary operations to shift E's bit right five times. Perform necessary operations to add E's content out FFH. After that, add couth carry whatever is in 1/2 content with His content Then, rotate right with comy his content 2 times. Otherwise terminate.

PROGRAM STATEMENT

To civite an assembly longuage program to subtract CDH from 1934. If result is negative, express 21's complement result in original difference form in register H. Also, some the sign bit in register L. Then copy His content to E. Perform necessary operations to shift E's bit right five times. Perform necessary operations to odd els content cuta FFH. After that, add outh corry wholever is in als content cult its content. Then, rotate night cuth corry als content 2 times. Otheraise, terminate.

PROGRAM ANALYSIS

STEP 1: Load The date the ABH into accumulator.

STEP 2! Load the data byte CDH into register B.

STEP 31 Subtract the content of accumulate cutth register B.

STEP 4: Check for result if positive or negative.

STEP 5! Take 2's complement of A

STEP 6: Copy result to H.

STEP 7! Set to 1 the sign bit.

STEP 8: Copy content of H to register E.

STEP 0: Shift Els bits right 5 times.

BTEP 10: Add E's content with FFH.

STEP 11: Add cuth comy cuhotever is in Nis content cuth his content.

STEP 12: Rotate right 1/s content 2 times.

STEP 13: Terminate the program.

ASSEMBLY LANGUAGE CODE

MVI A, SABH // Load the data byte ABH into accumulator.
MVI B, CDH // Load the class byte CDH into registry B.
SUB B // Subtract CDH from ABH

JM negative // If result is negative, jump to negative level.

JMP end // If result is Positive, jump to end level.

negative: CMA // Complement content of Accumulator.

ADJ OJH // Add OJH cuth accumulater immediately.

MON H, A 11 Copy content of accumulated to register H.

MUJ L, OJH /1 Set 1 to 1, indicating the negative result.

JMP end // Unranditional jump to end level label.

end: MOU E, H // More the content of register H to register E.

Mou & A.E. 11 More the content of register & to accumulater

RRC // Rotate right accumulator

RRC

R12 C

RR C

RRC ADI FFH

11 Add Acontent immediale alth value FFH.

ADC H // Add outn comy whotever is in Al's content outn H's

RAR // Rotate right accumulater cuth corry

RAR // Rotate right accumulated cuth carry

HLT // Terminate the program

Joput

A C-ABH

BE COH

Outpu+

A> BCH

1. Write a program to multiply too 0 a. by Repetition Addition Method b. by Rotation Method Repetion Addition Mothed PROGRAM STATEMENT To curite on assembly language program to multiply two 8-bit numbers Osh and Osh. a. by Repetiotion Method PROGRAM ANALYSIS ALGORITHM! STEP 1! Load the data byte OCH into accumulator. STEP 2: Load the data byte OSH into register B. STEP 3: Load the data byte O3H into accumulator. STEP 4: Add the content of register B outh accumulater on label STEP 5! Decremensed The content of register C by 1. STEP 6: Jump to x if not zero in register C. STEP 7! Store the content of accumulated on memory location 20501. STEP 8: Terminate the Program. ASSEMBLY LANGUAGE CODE MVI A, OOH //Load OOH into accumulator. MVI B, OSH // Load OSH into register B MUI C, O3H // Load O3H into register C. X: ADDB // Add content of accumulate and register B. 11 Decrease content of register C by 1. DCR C 11 Jump to x if content of C is not Bero. JNZ X STA 2055H // Store the result of accumulator in 2055H. 11 Terminak the program. HLT Japut ACOUM BLOSH CE 03H

Rototo Method

2. Conte a program to divide OF, data byte by O7,4 data byte by repeated subtraction method.

PROGRAM STATEMENT

To cosik on assembly language program to divide OFH data byte by 074 data byte by repeated subtraction method.

PROGRAM ANALYSIS

Algorithm:

STEP 1: Load accumulater cuth data byte OFH.

STEP 2: Load register B outh data byte 07H.

STEP 3: load register c outn data byte OUL1.

STEP 4: Compose A outh B on label X.

STEPS! Jump to 7 if cory.

STEP 6: Subtract content of A cuth 3.

STEP7: Increament content of register C by 1.

STEP 8: Unconditional jump to x.

STEP 6: Store The result of accumulator on mem. location 20564.

STEP 10: Mue tre Content of register C to accumulator.

STEP 11: Store the result of accumulator on mem. location 2055H.

STEP 12: Terminate the Program.

ASSEMBLY LANGUAGE CODE

MNI A, OFH // Lood accumulated cuth data byte OFH.

MUI B, 07H // lood register B cut date byte 07H.

MVI C, OUH // Load regists (cum data byte out.

X! CMPB // Compox A cum B.

11 Tump to lobel y if comy. JCYY

SUB B // Subtract B's content cut 10's content.

INEC // Increoment tre content of register (by 1.

&I JMP X // Unconditional JM ump to X

STA 2055H // Store The Content of accumulator to memory
lucation 2055H.

HLT // Terminate the program.

JNPUT

AE OOH

BE. 05H

CE 03H

OUTPUT

2055H - OZH

205 6H -> OIM

3. Cosite a program to multiply 16 bit number 2022 H by 8-bit number 03 H.

PROGRAM STATEMENT

To cusite a assembly language program to multiply 16 bit number 2022H by 8-bit number 03H.

DROGRAM ANALYSIS

ALGORITHM:

STEP1: Load the 8 bit - multiplier into register 13.

STEP 2: Inticlize 16 bit result to 3000.

STEP3: Load the 16 bit-number into register HL.

STEP 4: Load the high byte of the 16-bit number into accumulation

STEP 5! Sove a copy of the high byte in register D.

STEP 6', load the lower-byte of the 16-bit number into accumulater.

STEP7! Sove a copy of the lower byte in registre E.

STEP 8: Load 8-64 multiplies into register 10.

STEP 9: Double the value of the 8-bit multiplier, for 2 times.

STEP 10'. Add the high-byte of the 16-bit number to the result.

STEP 11: Add the high-byte of the 16-bit numbers to the result with

STEP 12: Load the 8-bit multiplies into ocqists A.

STEP 13! Add the low byt of the 16 bit number to the result.

STEP 15. Add the low byte of the 10 bit number to the result

STEP 15! Store the low byte of the result in memory.

GTEP 10: Increase the memory pointer.

STEP 17! Mar the control of orgists it to Occumulator.

STEP 19! Store the night byte of the result in memory location 200 STEP 20: Terminot the Physian.

ASSEMBLY LANGUAGE CODE

MUI B, O3H // Load the 8 bit multiplier Into registry B Mus c, OOH // Intialize The 16 bit treat to zero. LXI H, 2020H // Load the 16-bit number into registed HL. May at // load the high byte of 16-6+ number into accumulates. Mou Dis // Sove a copy of the high byte in registro D. Mar E, a 11 Gave a copy of the loans byte in registed E. May 9,3 // Lood & bit multiplier into accumulated. ADD A 11 Double tre value of the 8-bit multiplier. ADD A 11 Double the value of the 8-6+ multiplier. ADD H / Add the high of the 16-bit number to the result. ADE D A Add the high byte of the 10-bit number to result with comy. Mou 1013 / Load the 8-bit multiplier into registed to. ARdd the low-byt of the 16-bit number to the result ACC DC // Add the loca-byte of the 16-bit number to the result cuth corre MONM, 1 // Store the low-byt of the result in memory INX H // Jacreament the memory points MON AH I Move the result of registro H to acocumulator STA 2000H // Store the DESUH of accumulater in memory location 2000H.

INPUT BG 03H HLG 2020H CG 00H

11 Terminate the program.

7U9 7U0

2000H -> 20H