|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| The below is a given scenario. What will be the values of GPR, SP and STACK after executing the following instructions:  sp🡨FE02  PUSH FFh  POP Z.   |  |  |  |  |  | | --- | --- | --- | --- | --- | | GPR | | Sp | STACK | | | R26 | FFh | FE05 | 15h | | R27 | 05h | FE04 | EFh | | R28 | F0h | FE03 | CDh | | R29 | EFh | FE02 | 54h | | R30 | 15h | FE01 | 66h | | R 31 | 00h | FE00 | 00h | |

***Solution:***

SP=

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| ~~FE02~~ | ~~FE01~~ | ~~FE02~~ | FE03 |  |  |

GPR

|  |  |  |
| --- | --- | --- |
| R26 | FFh |  |
| R27 | 05h |  |
| R28 | F0h |  |
| R29 | EFh |  |
| R30 | ~~15h~~ | FFh |
| R31 | ~~00h~~ | CDh |

Stack

|  |  |  |
| --- | --- | --- |
| FE05 | 15h |  |
| FE04 | EFh |  |
| FE03 | CDh |  |
| FE02 | ~~54h~~ | FFh |
| FE01 | 66h |  |
| FE00 | 00h |  |
|  |  |  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | | GPR | |  | IVT | | | SP | STACK | | | R26 | FFh | # | Address | Source | FE05 | 15h | | R27 | 05h | 5 | 0008h | INT 0 | FE04 | EFh | | R28 | F0h | 6 | 000Ah | INT 1 | FE03 | CDh | | R29 | EFh | 7 | 000Ch | Timer 0 | FE02 | 54h | | R30 | 15h | 8 | 000Eh | Timer 1 | FE01 | 66h | | R 31 | 00h | 9 | 0010h | SPI | FE00 | 00h |   The above is a given Scenario.  SP 🡨 FE00 h.  Program Countger   |  |  | | --- | --- | | **Address** | **Instruction** | | A002h | PUSH AAh | | A004h | POP Y |   Suppose , after this INT 1 & SPI occur at the same time. What will be the values of GPR, SP and STACK.  ***Solution:***  SP=   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | ~~FE00h~~ | ~~FDFFh~~ | ~~FE00h~~ | ~~FE01h~~ | ~~FE00h~~ | FDFFh |   GPR   |  |  |  | | --- | --- | --- | | R26 | FFh |  | | R27 | 05h |  | | R28 | ~~F0h~~ | AAh | | R29 | ~~EFh~~ | 66h | | R30 | 15h |  | | R31 | 00h |  |   Stack   |  |  |  |  | | --- | --- | --- | --- | | FE05 |  |  |  | | FE04 |  |  |  | | FE03 |  |  |  | | FE02 |  |  |  | | FE01 | ~~66h~~ | A0h |  | | FE00 | ~~00h~~ | ~~AAh~~ | 06h | | FDFF |  |  |  |   as int1 has lowest value , so it will execute. |

**Instruction:**

**During push**

**1st insert the value in the stack on the address pointed by SP then decrement SP**

**During POP**

**1st increment the sp the store the value in GPR**