

- 1- *If a floppy disk is rotating at 300 revolutions per minute and the machine can execute 40 instructions in a microsecond.*
- a- *How many instructions can the machine perform during the disk's latency time?*
 - b- *Compare the latency time of the floppy disk with that of a typical hard disk drive spinning at 60 revolutions per second.*

- 2- a- *Explain the function of the following dedicated CPU registers: PC register, IR register, SP register*
- b- *Design a 4 bits general purpose register with the following Operational Table:*

<i>S1</i>	<i>S0</i>	<i>Function</i>
<i>0</i>	<i>0</i>	<i>Load external data</i>
<i>0</i>	<i>1</i>	<i>Shift left</i>
<i>1</i>	<i>0</i>	<i>Shift Right</i>
<i>1</i>	<i>1</i>	<i>Decrement</i>

- 3- a- *Using a minimum number of 0-address instructions, write a program that is equivalent to :*

$$Z = A*B + C*D + E*F$$

b- *Define:*

- i- Router*
- ii- Virtual Memory*
- iii- Software Utility*
- iv- Booting Procedure*