ID 14726

M. Bilal
Assignment # 2

1

Q1

A)

Ans:-
Different desktop applications that require the great power of contemporary microprocessor based system are:

Image Processing
Three dimensional rendering
Speech recognition
Video Conferencing
Simulation modeling.

B)

Ans:
The Technices used in Cont Temporary Processor to increase speed are following.

Pipelining:
Pipelining enables a Processor to work Simultaneously on multiple instruction by Performing a different phase for each of the multiple instruction at the same time.

M. Bilal
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Branch Predictions:-
Branch Prediction Potentially increase the amount of work aviable for the Processor to execute.

Superscalar executions:-
This is the ability to issue more than one instruction in every Processor Clock cycle In effect multiple parallel are used.

Data flow analysis:-
The Processor analyzes which instruction are dependent on each other's result or data to Create an optimized Schedule of instruction.

Speculative executions:-
This enables the processor to keep it execution engines as busy as Possible by executing instruction that are likely to be needed.

M. Bilal
ID 14726

D)
Ans:-

Multicore:-
The use of multiprocessor on the same chip provides the potential to increase performance without increasing the clock rate.
Strategy is to use two simpler processor on the chip rather than one more complex processor.
With two processor large caches are justified.

MIC:-
Leap in performance as well as the challenges in developing software to exploit such as large number of core.

GPUs:-
Core design to perform parallel operation on graphic data.

Used as vector processor for a variety of application that require repetitive computations.

M. Bilal
ID 14728

Q2
A)
Anss-

Effect Cpi:-

Cpi = (1*46000) + (2*33000) + (2*16000) + (2*9000) / 100

Cpi = 162000/1000

Cpi = 1620

Mips rates:

Mips rate = 60 MHZ / 1620 * 106

Mips rate = 60 * 106 / 1620 * 106

Mips rate = 60/1620

Execution Time:-

T = Ic / (Mips * 106)

T = 104000/(0.037 * 106)

T = 2811 * 10-3

T = 2.811 sec.

M.Bilal
ID 14726

5

B)
Ans:-

For Machine A:-

CPI = (1*8+3*4+4*2+3*4) * 106 / (8+4+2+4) * 106

CPI = 40 * 106 / 18 * 106

CPI = 2.22

Mips rate = 200 MHZ / 2.22 * 106

Mips rate = 200 * 106 / 2.22 * 106

Mips rate = 90

T = Ic (Mips * 106)

T = 18 * 106 / 90 * 106

T = 0.2 sec.

For Machine B:

CPI = (1*10 + 2*8 + 4*2 + 3*4) * 106 / (10+8+2+4) * 106

CPI = 46/24

CPI = 1.92

Mips rate = 200 MHZ / 1.92 * 106

Mips rate = 200 * 106 / 1.92 * 106

M. Bilal
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MIPS rate = 104
T = IC / (MIPS * 106)

T = 24 * 106 / 104 * 106
T = 0.23 Sec.

c)
a)
Ans: The mips rate could be computed as the following.
mips rate = IC / T * 106
IC = mips rate = T * 106
Now by computing the ratio of the instruction count of the IBM RS/6000 to the VAX 11/780

18 * 1x * 106 / 1 * 12 x * 106

= 18/12
= 1.5

b)
Ans:- Regarding to the VAX 11/780 the CPI = (5MHz) / (1 * 106) = 5 * 106 / 1 * 106

= 5/1 = 5
Regarding to the IBM RS/6000 the CPI = (25MHz) / (18 * 106) = 25 * 106 / 18 * 106
= 25/18 = 1.4.