DHARMSINH DESAI UNIVERSITY, NADIAD
FACULTY OF TECHNOLOGY
B.TECH. SEMESTER V [INFORMATION TECHNOLOGY]
SUBJECT: (IT-506) ADVANCED MICROPROCESSOR ARCHITECTURE

Examination	**: Second Sessional**	**Seat No.**	**: _____**
Date	**: 06/09/2018**	**Day**	**: Thursday**
Time	**: 11:45 to 1:00**	**Max. Marks**	**: 36**

INSTRUCTIONS:
1. Figures to the right indicate maximum marks for that question.
2. The symbols used carry their usual meanings.
3. Assume suitable data, if required & mention them clearly.
4. Draw neat sketches wherever necessary.

Q.1 Do as directed.

(a) Which of the following is/are true about the 80386 TSS descriptor? **[2]**
(1)It is system segment descriptor. (2)If B=0, the TSS is available. (3)Minimum value of LIMIT is 00067h. (4)The TSS descriptor is stored only in the LDT.

(b) If the instruction LIDT loads the limit 01FFh and base 00210000h, what are the starting and ending addresses of IDT table? How many GATE descriptors can be stored in the table? **[2]**

(c) What are the memory models of C language? Which is the default memory model used by turboc3 compiler? **[2]**

(d) Assume that the base address of the GDT is 00011000h and the selector in the TR is 2108h.What is the address range of TSS descriptor? **[2]**

(e) In Protected mode of 80386 all memory segment must start with nibble zero. State true/false & justify. **[2]**

(f) Offset part of the far CALL/JMP instruction is ignored if selector part is pointing to call gate descriptor. State true/false & justify. **[2]**

Q.2 Attempt ***Any Two*** from the following questions. **[12]**

(a) In multiuser/multitasking system, OS should be protected from user program and user program should be isolated from each other and they should be protected from each other. Explain in detail the support provided by 80386 in PM to implement the above requirements. **[6]**

(b) **(I)**Write a program to convert given Celsius value to Fahrenheit using the interfacing of C module with assembly module. The C modules passes a Celsius value to assembly module and assembly module return Fahrenheit value to C module and print it on screen. **[4]**
(II) What is the mechanism available to run 8086 type program in protected mode of 80386? Explain in brief. **[2]**

(c) **(I)**Assume that the base address of LDT is 00120000h and GDT base address is 00100000h. If value loaded into the CS register is 1007h, What is the RPL? Is the segment descriptor in the GDT or LDT? What is the address of the segment descriptor? **[2]** **[2]**
(II) Explain the mechanism supported by 80386 in PM for protecting specific ports from unauthorized access by specific tasks.
(III) Specify the major hardware features provided in Pentium processor on chip. **[2]**

Q.3 (a) If a far pointer of a user CALL instruction consists of 48-bit virtual address as 200800002000h, what is the starting physical address of segment descriptor? The content of GDTR is 2AB4587320FFh. If GDT contains following descriptor: **[6]**

		Byte
0F	F0	6
8C	00	4
FE	60	2
03	FF	0

Describe above segment descriptor in detail. Will processor allow to execute the CALL instruction? Justify your answer. What is the starting physical address of the subroutine?

(b) What will be the minimum size of Limit for IDT to avoid an exception when type 12h interrupt arrives in 80386 in PM? Show your calculation. The following is the Interrupt Gate Descriptor whose content is as follows : **[6]**

		Byte
00	0F	6
9E	00	4
00	90	2
00	00	0

Is this a valid Interrupt Gate Descriptor? Justify your answer and suggest necessary correction(s), if any. Now if GDTR=000080000080h and selector of this gate descriptor when loaded in CS register, will there be any exception? If no, why? If yes, do the correction in the content of GDTR so that there would not be any exception.

OR

Q.3 (a) Selector of the following descriptor must be loaded into which segment register of 80386 in PM and why? Which are all the checks 80386 will do and will there be exception(s) due to this checks? **[6]**

		Byte
00	8F	6
F1	13	4
FF	C3	2
FF	FF	0

Now if following instruction is executed in PM of 80386 :
MOV [000FFFFFh],12345678h
Will there be any exception? Justify your answer. If any exception, suggest the modification in the descriptor to avoid that exception.

(b) Assuming that Selector= 1005h, EBX=000012CDh, descriptor pointed by selector is **[6]**

		Byte
00	C0	6
F1	13	4
FF	C3	2
FF	FF	0

Selector of this descriptor must be loaded into which register of 80386 in PM? Find out index number of descriptor pointed by selector. Now If CR0=80000001 and CR3=23455XXXh, the Page table address in the PDE0= 45345XXXh, the PDE1= 4567XXXh, the page Frame address in the PTE319=67345XXXh. PTE321=67333XXXh.Calculate The physical address of the page directory, page table and page frame.