

[Total No. of Questions: 12]

[Total No. of Printed Pages: 3]

UNIVERSITY OF PUNE

[4363]-10

T. E. (Electronics/electronics and Telecommunication Engg)

Analog Integrated Circuit Design and Application (2003 Course)

[Time: 3 Hours]

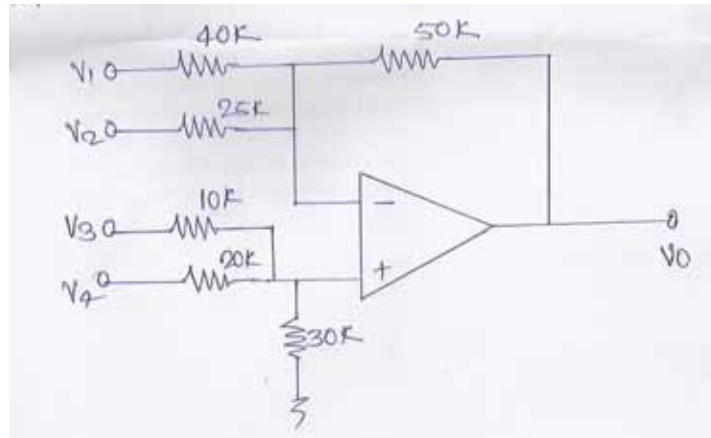
[Max. Marks: 100]

Instructions:

- 1 Answers to the **two sections** should be written in **separate answer-books**.
- 2 Neat diagrams must be drawn wherever necessary.
- 3 Figures to the right indicate full marks.
- 4 Use of logarithmic tables and electronic pocket calculator is allowed.
- 5 Assume suitable data, if necessary.

SECTION -I

- | | | | |
|-----------|---|--|----|
| Q.1 | A | Define & Explain following Opamp parameters with their measurement techniques.
1. Input Bias Current. 2. Input Offset Current
3. Input Offset Voltage 4. CMRR
5. PSRR 6. Slew Rate | 12 |
| | B | Explain the frequency response of opamp? | 6 |
| OR | | | |
| Q.2 | A | What is frequency compensation? Explain internal and external frequency compensation in detail | 10 |
| | B | Explain virtual ground concept with opamp circuits? | 8 |
| Q. 3 | A | Explain the summing and differential amplifier using opamp with derivation of output voltage. | 8 |
| | B | Design the opamp ckt which can give the output as.
$V_0 = 2V_1 - 3V_2 + 4V_3 - 5V_4$. | 8 |
| OR | | | |
| Q. 4 | A | Find the output of following circuit. | 8 |



- B An integrator using opamp has following component values. $R_1 = 1k$, $R_f = 100k$ and $C_f = 0.1\mu f$. A 1kHz square wave applied to integrator. The amplifier uses $\pm 15V$ supply and output saturates at $\pm 14V$ if input alternates between $\pm 5V$ then
- 1) Determine the maximum Change in o/p
 - 2) Determine the maximum slew rate.
- Q. 5 A Design a circuit (Window Comparator) to monitor an input voltage. Turn the indicator when input goes outside the range of 4.5V - 5.5V 8
- B Write short note on 8
- 1) Peak detector
 - 2) Clipper and clamper using opamp
- OR**
- Q. 6 A A system uses ON-OFF temperature controller. Temperature is to be maintained between $25^\circ C$ to $30^\circ C$, the temperature transducer generates the voltage of 0.5v at $25^\circ C$ and 30 V at $25^\circ C$. heater is operated through relay of 12V, 100mA. Design suitable circuit opamp. 10
- B Define and explain following performance parameters of sample and hold circuit. 6
- 1) Aperture time
 - 2) Acquisition time
 - 3) Hold step
- SECTION II**
- Q. 7 A Draw and explain function generator using IC8038? 6
- B Draw and explain operation of square wave generator using Op-amp with waveforms? Derive the expression for frequency and duty cycle generated? Explain the modification for Duty cycle control? 10
- OR**
- Q. 8 A Explain frequency to voltage converter and draw the 8

		neat diagram using VFC32?	
	B	Design a FSK generator using IC 555 for logic 1 = 1070Hz and Logic 0=1270Hz	8
Q. 9	A	Compare active and passive filters?	6
	B	Explain the Band pass and Band stop filter? How higher order can be obtained?	6
	C	Give the advantages and disadvantages of active filter	6
		OR	
Q. 10	A	Design Band Stop filter for $F_1=500\text{Hz}$ and $F_2=5\text{KHz}$	6
	B	Draw and explain the operation of Sallen and Key LPF filter using op-amp.	6
	C	Explain the various approximations used in active filters?	6
Q. 11	A	Discuss various techniques for analog multiplier? Explain the following applications of multipliers 1) Squaring Circuit 2) Frequency doublers	8
	B	Design a PLL for lock range $F_1=20\text{KHz}$, $F_c=5\text{KHz}$, $F_0=40\text{KHz}$? Explain it as FM/FSK demodulator	8
		OR	
Q. 12	A	Explain what is PLL with its operation? Explain the following parameters 1) Lock Range 2) Capture Range 3) Pull in Time	8
	B	Design a VCO as FM generator using 566 for $\Delta f=10\text{KHz}$ and $f_c=100\text{KHz}$? Draw the suitable circuit.	8

[Total No. of Questions: 12]

[Total No. of Printed Pages: 2]

UNIVERSITY OF PUNE

[4363]-13

T. E. (E & TC) Examination – 2013

Advanced Microprocessor (2003 Course)

[Time: 3 Hours]

[Max. Marks: 100]

Instructions:

- 1 *Answer 3 questions from each section-I & section-II*
- 2 *Answers to the two sections should be written in separate answer-books.*
- 3 *Neat diagrams must be drawn wherever necessary.*

SECTION –I

- | | | | |
|-----------|---|--|----|
| Q.1 | A | Compare the features of 8086,80286,80386,80486 & Pentium processor. | 08 |
| | B | Explain evolution of Intel 8086 to Pentium with focus on clock speed, concurrent operation of ED & BIU. | 08 |
| OR | | | |
| Q.2 | A | Describe interrupt structure of 8086. | 08 |
| | B | Write assembly language program to count length of string "University" | 08 |
| Q. 3 | A | Explain Multitasking. How it is achieved in 80386? | 08 |
| | B | Draw programmer's model of 80386 in protected mode & explain in details. | 08 |
| OR | | | |
| Q. 4 | A | Explain with example how logical address is calculated. Assume suitable data. | 08 |
| | B | Explain real mode of 80386. | 08 |
| Q. 5 | A | Draw and explain the functional block diagram of DMA controller. | 08 |
| | B | How characters are displayed in CRT? Explain. | 10 |
| OR | | | |
| Q. 6 | A | What is key debouncing and scan codes in keyboard of personal computer and how scan codes are generated when key is pressed. | 08 |
| | B | Write short note on
i. CD-ROM interface | 10 |

ii. VGA

SECTION II

Q. 7	A	What are hardware and software blocks in USB devices? Explain data transfer control between host and USB device.	08
	B	Write short note on i. PCI bus ii. VXI bus	08
OR			
Q. 8	A	Explain the interface of input port to EISA bus.	08
	B	Interface 8bit ADC to a comp port.	08
Q. 9	A	What is device driver? Explain the structure of MS-DOS devices driver	08
	B	Explain the concept of shell & shell programming	08
OR			
Q. 10	A	What is process? Explain the concept of process management in details.	08
	B	Explain the concept of file management in operating system.	08
Q. 11	A	Compare RISC and CISC processor.	08
	B	Explain the programmer model of ARM core	10
OR			
Q. 12	A	Describe various modes of operation of ARM core. Explain CPSR & SPSR in details.	10
	B	Explain any four instructions of ARM in details.	08

UNIVERSITY OF PUNE
[4363]-11
T. E. (E &TC) Examination 2013
DIGITAL DESIGN AND COMPUTER ORGANIZATION
(2003 Pattern)

[Total No. of Questions:]

[Time : 3 Hours]

Instructions :

[Total No. of Printed pages :3]

[Max. Marks : 100]

- (1) Answer *any 3 questions* from each section- I and 3 questions from Section- II.
 - (2) Answers to the *two sections* should be written in *separate answer-books*.
 - (3) *Black figures to the right* indicate full marks.
 - (4) *Neat diagrams must be drawn wherever necessary.*
 - (5) *Use of electronics pocket calculator is allowed.*
 - (6) *Assume suitable data, if necessary.*
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SECTION-I

- Q1. a) Draw and explain block diagram of Mealy and Moore machine. [8]
- b) Explain the working of serial adder with the help of a state diagram. [8]

OR

- Q2. a) What are the static and dynamic hazards? Explain how static hazards are eliminated. [6]
- b) Explain ASM chart notations in detail. [6]
- c) Draw FSM state machine to detect an overlapping sequence -1101- [4]

- Q3. a) Explain the difference between signal and variable. [6]
b) Explain entity and process. [4]
c) Write VHDL code for 4:1 multiplexer. [6]

OR

- Q4. a) Write VHDL code for 4- bit up counter with reset input. [8]
b) Explain different modeling styles of VHDL. [8]
- Q5. a) Draw a flow chart and explain the Booth's Algorithm used for signed number multiplication. [8]
b) Explain the concept of look ahead carry generator .Explain its advantages. [6]
c) Draw Von Neumann Architecture. [4]

OR

- Q6. a) Explain different IEEE standards for representing floating point numbers. [8]
b) Represent the following in single precision format [6]
i) -1.5 ii)15
c) What are the rules to perform multiplication and division of floating point numbers. [4]

SECTION –II

- Q7. a) Explain with suitable example execution of a complete instruction using single bus organization. [12]
- b) Differentiate between stack and queue. [4]

OR

- Q8. a) Explain following addressing modes with suitable examples. [12]
- i) Immediate addressing mode.
 - ii) Direct addressing mode.
 - iii) Indirect addressing mode.
 - iv) Register addressing mode.
 - v) Index mode.
 - vi) Auto increment mode.
- b) Explain the role of stack in execution of subroutines. [4]
- Q9. a) Explain an interrupt structure with suitable example (any processor). [8]
- b) Explain memory mapped I/O and I/O mapped I/O. [8]

OR

- Q10. a) List out different system buses along with their features. [8]
- b) Explain different bus arbitration methods. [8]
- Q11. a) Explain different types of RAMs in detail. [8]

b) What are the differences between SRAM and DRAM? Explain need of refreshing in case of DRAM. [6]

c) Explain memory hierarchy. [4]

OR

Q12. a) Explain with neat sketch, concept of cache memory and also explain the role of cache controller. [10]

b) Explain functioning of CD-ROM and DVD. [8]

UNIVERSITY OF PUNE

[4363]-7

T. E. (Electronics & Telecommunication)-Examination 2013

MECHATRONICS(304185)

(2003 Pattern)

[Total No. of Questions:12]

[Total No. of Printed pages :2]

[Time : 3 Hours]

[Max. Marks : 100]

Instructions :

- (1) Answers **any 3** questions from each section*
- (2) Answers to the **two Sections** should be written in **separate answer-books***
- (3) Neat diagram must be drawn wherever necessary.*
- (4) Figures to the right indicate full marks.*
- (5) Assume suitable data, if necessary.*
- (6) Use of logarithmic tables slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.*
- (7) Assume suitable data, if necessary.*

SECTION-I

- Q.1 a) Define the term Mechatronics. Explain the role of mechatronics in design of elevator system in detail. [10]
b) Explain different types of error involved in the measurement system. [8]
How to reduce these error.

OR

- Q.2 a) Explain the term static characteristics and dynamic characteristics. [10]
Explain the terms
i) Speed of Response ii) measuring lag iii) Fidelity
b) Justify with suitable examples scope and importance of mechatronics [8]
with respect to interdisciplinary approach
- Q.3 a) Explain construction and working of LVDT. [8]
b) List any four Sensors used for pressure measurement. compare their [8]
different characteristics.

OR

- Q.4 a) Explain with the help of wheatstone bridge arrangement, how output [8]
voltage is calibrated in terms of force in case of cantilever beam load cell.
b) Enlist different specifications of a temperature transducer for selecting [8]

it for typical application. Explain fibre optic temp transducer.

- Q.5 a) Explain the role of instrumentation amplifier in signal conditioning. [8]

what is the use of wheatstone's bridge? Justify with proof.

- b) Enlist the features of PIC microcontroller? Draw an interfacing of keyboard (4×3) with PIC 16F84 also make provision of displaying the key pressed. [8]

OR

- Q.6 a) Give performance parameters for selection of DAC. Draw an interfacing to interface temperature level and displacement (mechanical) sensors with 89C51 processor. [8]

- b) Draw and explain in depth PLC architecture with different functions? Draw the ladder diagram to implement AND and X- or gates. [8]

SECTION II

- Q.7 a) Draw the block diagram of magnetic tape recording and reproducing system. Explain its working. [8]

- b) With a neat block diagram Explain data logger and its functions. Briefly explain the function of each block. [8]

OR

- Q.8 a) With necessary timing diagram Explain the communication procedure in IC² bus [8]

- b) Enlist different components of data acquisition system. with neat diagram explain multichannel DAS. Give typical application of DAS. [8]

- Q.9 a) Define the term actuator. Explain electropneumatic actuator in detail. [8]

- b) Define the term control valve. Explain different factors for selection of control valve. [8]

OR

- Q.10 a) List the different specifications of stepper motor. Explain in detail stepper motor as electrical actuators. [8]

- b) Explain construction and working of double acting cylinder. [8]

- Q.11 a) Define the term strain gauge. Explain in detail how strain gauge is used in weighing machine. [9]

- b) Discuss Rotary optical encoder as mechatronics design approach. [9]

OR

- Q.12 a) Define SKIP control of CD player as a mechatronics design approach. [9]

- b) Design a Robotics walking machine that will execute different motions [9]