B Tech. ECE 7th Sem Dec. 2018

University Institute of Engineering & Technology

(Recognised Under Section 2(f) and 12B of UGC)

Kurukshetra University, Kurukshetra

THEORY EXAMINATION - DECEMBER 2018		Write Your Roll No-_____	
B.TECH.-ECE	SEMESTER-7TH	TIME-3 Hours	MAX.MARKS-75
COURSE NO. - ECE-401	COURSE TITLE - Microcontroller and Embedded System Design		

Note: All questions in Part-A and Part-B are compulsory. Attempt any four questions from Part-C selecting at least one from each unit.

PART-A (15 Marks)

Q. No. – 1 Answer the following questions. **15x1=15**

(i)	List the criteria for choosing a microcontroller.
(ii)	List applications of embedded system in various areas.
(iii)	List advantages and disadvantages of various types of memories used in microcontrollers.
(iv)	What is the key feature of Harvard architecture?
(v)	When do we need an RTOS?
(vi)	How stacks are accessed in the 8051?
(vii)	What are the advantages of CMOS (technology) based microcontrollers (devices)?
(viii)	Which 8051 ports need pull-up registers to function as an I/O port? How to configure port as an input and output?
(ix)	A switch is connected to pin P1.7 and a LED to pin P2.0. Write a program to get the status of the switch and send it to the LED.
(x)	Show how the CPU would subtract 05H from 43H?
(xi)	How can a timer be configured as counter? What will be the frequency of timer clock if the crystal frequency is 12MHz?
(xii)	Which SFRs in the 8051 are used to control UART operation and which bit is used to double the baud rate?
(xiii)	What is the resolution of 8 bit ADC for input analog voltage range 0 to 5 volt? What will be the digital output for V_{IN}= 1.28V and V_{REF} pin is open?
(xiv)	What is an H-Bridge? Why it is used?
(xv)	List applications of Stepper and DC motor.

PART-B (20 Marks)

	UNIT-I	
2	What is an embedded system? Explain various types of processors and microcontrollers embedded into a system?	**5**
	UNIT-II	
3	Write the meaning of each flag of IE and IP registers. Explain what is the purpose of IP and IE registers?	**5**
	UNIT-III	
4	Assuming that XTAL=11.0592 MHz, write a program to generate a square wave of 2kHz frequency on pin P1.5.	**5**
	UNIT-IV	
5	Explain how to interface temperature sensor with 8051?	**5**

PART-C (40 Marks)

	UNIT-I	
6	Explain in detail various hardware units, software tools and devices are used for designing an embedded system.	**10**
7	Explain design process of "Digital Camera" and what are the digital hardware unit and software components require for designing a "Digital Camera"?	**10**
	UNIT-II	
8	Draw pin diagram of 8051 and discuss the functions of each pin?	**10**
9	Show with the help of diagram, how a timer work and describe the operation and to configure a timer as an interval timer?	**10**
	UNIT-III	
10	Write a program to toggle all the bits of Port 1 by sending to it the values 55H and AAH continuously. Put a time delay in between each issuing of data to Port1. Find the size of time delay, if the crystal frequency is 11.0592MHz.	**10**
11	Draw architecture diagram of PIC16C74 microcontroller and explain the core and peripheral features of PIC16C74 microcontroller.	**10**
	UNIT-IV	
12	Interface the DAC0808 with the 8051 and write a program to generate a sine wave.	**10**
13	Design a system which contains a 16-key matrix keyboard and 8 LEDS interfaced with 8051. Develop a program to detect the key press and key identification. The binary code of the pressed key should be displayed on LEDs.	**10**

Univer

COURSE NO. - ECE-403

Note: All questions in
Part-C selecting at le

Q. No. – 1 Answer

(i)	Describe Ima
(ii)	Discuss Brig
(iii)	Define Col
(iv)	Draw Bloc
(v)	Define N
(vi)	List vari
(vii)	List va
(viii)	Give
(ix)	Defi
(x)	Lis
(xi)	Di
(xii)	D
(xiii)	
(xiv)	
(xv)	

University Institute of Engineering & Technology

(Recognised Under Section 2(f) and 12B of UGC)

Kurukshetra University, Kurukshetra

Roll No. -

THEORY EXAMINATION – DEC 2018	
B.TECH - ECE	**SEMESTER - VII**

TIME – 3 Hrs.

M.M. - 75

COURSE NO. - ECE-403

COURSE TITLE - Digital Image Processing

Note: All questions in Part-A and Part-B are compulsory. Attempt any four questions from Part-C selecting at least one from each unit.

PART-A (15 Marks)

Q. No. – 1 Answer the following questions. **15x1=15**

(i)	Describe Image Data Compression.
(ii)	Discuss Brightness and Contrast.
(iii)	Define Color Image Representation.
(iv)	Draw Block Diagram of Digitization and Display of images.
(v)	Define Nyquist Rate.
(vi)	List various Spatial operations on an Image.
(vii)	List various Point operations on an Image.
(viii)	Give examples of Computer Vision Apllications.
(ix)	Define Sobel Edge operator.
(x)	List Regnerative Features for Shape Feature extraction.
(xi)	Differentiate 4 and 8 level connectivity.
(xii)	Discuss tempelate matching for image segmentation.
(xiii)	Define Digital Negative.
(xiv)	Define COMB Filter.
(xv)	Explain Histogram of an image.

PART-B (20 Marks)

	UNIT-I	
2	Explain typical Digital Image Processig system with th help of suitable diagram.	**5**
	UNIT-II	
3	Illustrate Image Quantization and its impact on Image Size.	**5**
	UNIT-III	
4	Describe Spatial Averaging and Low Pass Filtering with 3x3 window filter.	**5**
	UNIT-IV	
5	Define various egedetecion operators.	**5**

PART-C (40 Marks)

	UNIT-I	
6	Explain Image Enhancement, Restoration and Image Analysis	**10**
7	Explain Simultaneous Contrast and Mach Band effect of Human eye.	**10**
	UNIT-II	
8	Why we do samplingof images? Explain Samping Theorem in detail.	**10**
9	Explain Quantization. Discuss Lloyd Max Quantizer in detail.	**10**
	UNIT-III	
10	What do you understand by Point Operations on Digital Image. Discuss various Point operations.	**10**
11	Distinguish Histogram Equalization and Histogram Modification with suitable real life examples.	**10**
	UNIT-IV	
12	Explain various Spatial Feature Extraction Algorithsms.	**10**
13	Explain various Boundary Extraction Algorithsms with suitable example.	**10**

Roll No. -

University Institute of Engineering & Technology *Kurukshetra University, Kurukshetra*		
THEORY EXAMINATION – DECEMBER 2018		**TIME – 3 Hrs.**
B.TECH – Electronics & Communication Engineering	**SEMESTER – VII**	**M.M. - 75**
COURSE NO. - ECE-405	**COURSE TITLE –POWER ELECTRONICS**	

Note: All questions in Part-A and Part-B are compulsory. Attempt any four questions from Part-C selecting at least one from each unit.

PART-A (15 Marks)

Q. No. – 1 Answer the following questions. 15x1=15

1)	Write down the three application of power electronics.
2)	Discuss reverse recovery time and reverse recovery current.
3)	Draw V-I characteristics of power diode.
4)	Define static induction generator in short.
5)	Define latching and holding currents.
6)	Write down the various methods for protection of SCR against overcurrent.
7)	Discuss the need of commutation.
8)	Differentiate between current and voltage commutation.
9)	Explain reversal of voltage across the capacitor during commutation.
10)	What is the need for series combination of SCR.
11)	Describe the principle of operation of converter.
12)	Explain force commutated thyristor inverter.
13)	What do you mean by AC voltage controller?
14)	List some of its industrial applications of AC voltage controller.
15)	Draw the waveforms for three phase to single phase cycloconverter.

PART-B (20 Marks)

	UNIT-I	
2	Draw the static drain characteristics and transfer characteristics curves for an N-channel enhancement type MOSFET.	5
	UNIT-II	
3	Discuss what would happen if gate is made positive with respect to cathode during reverse blocking of an SCR.	5
	UNIT-III	
4	Explain the effect of source impedance on the performance of converters.	5
	UNIT-IV	
5	What do you mean by cycloconverter? Distinguish between circulating and non-circulating type of cycloconverter.	5

PART-C (40 Marks)

	UNIT-I	
6	What do you mean by power electronics converter? Discuss its various types in brief.	10
7	Explain the Static and dynamic characteristics of IGBT?	10
	UNIT-II	
8	Discuss how SCRs suffer from unequal voltage distribution across them during their turn-on and turn-off process.	10
9	Explain the need of commutation in thyristor circuits. What are the different methods of commutation schemes? Discuss one of them, involving two thyristor, with a neat schematic and waveforms.	10
	UNIT-III	
10	Explain the operation of a single phase fully controlled bridge converter connected with R-L load. Show the possible waveforms of the output voltage, SCR current & source current for a firing angle and Considering ripple free output current.	10
11	With the help of a circuit schematics describe principle of step up chopper. Obtain the expression for average output voltage in terms of duty ratio.	10
	UNIT-IV	
12	Explain the principle and working of Integral cycle controller with various waveforms and equations.	10
13	Describe the operating principle of single-phase to single phase step-down cycloconverter with the help of mid-point configuration in continuous mode of operation.	10

University Institute of Engineering & Technology

(Recognised Under Section 2(f) and 12B of UGC)

Kurukshetra University, Kurukshetra

Roll No. -

TIME – 3 Hrs.

THEORY EXAMINATION – DEC 2018		
B.TECH - ECE	SEMESTER - 7th	M.M. - 75

COURSE NO. - ECE-429

COURSE TITLE - Consumer Electronics

Note: All questions in Part-A and Part-B are compulsory. Attempt any four questions from Part-C selecting at least one from each unit.

PART-A (15 Marks)

Q. No. – 1 Answer the following questions. **15x1=15**

(i)	List the characteristics of microphones.
(ii)	Describe the primary difference between longitudinal and traverse waves.
(iii)	Differentiate between hedphones and headsets.
(iv)	Explain the difference between a microphone and a loudspeaker.
(v)	What are the different methods of achieving four channel sound?
(vi)	List different type of scannning.
(vii)	Define Aspect Ratio.
(viii)	Define Gamma
(ix)	Differentiate additive primaries and subtractive primaries.
(x)	List most popular video formats.
(xi)	What is significance of a video responder?
(xii)	Differentiate between a wireless and a line communication system.
(xiii)	Explain PBX Switching.

(xiv)	List the inputs and outputs of Washing Machines.	
(xv)	Differentiate between all air and an all water air conditioning system.	

PART-B (20 Marks)

	UNIT-I	
2	Explain the law of reflection of sound and explain how echo may be prduced.	5
	UNIT-II	
3	Discuss basic elements of Television System.	5
	UNIT-III	
4	Explain the basic xerographic process.	5
	UNIT-IV	
5	What do you understand by Air Conditioning System? Explain its components.	5

PART-C (40 Marks)

	UNIT-I	
6	What are different type of headphones based on their construction? Explain in detail.	10
7	Discuss various control circuits of modern system.	10
	UNIT-II	
8	Discuss the concept of dispersion of colours from white light. Differentite between a monoochrome and a colour picture tube.	10
9	What are various disc recording mediums. Xplainwith the help of block diagram video disc matering and replication.	10
	UNIT-III	
10	Discuss various principles of switching system. Explain four digit step-by-step automatic exchange.	10
11	Discuss in detail various Automated Teller Machines.	10
	UNIT-IV	
12	Explain Digital Clock with the help of block diagram.	10
13	Explain the working of a domestic refrigerator.	10

University Institute of Engineering & Technology

(Recognised Under Section 2(f) and 12B of UGC)

Kurukshetra University, Kurukshetra

THEORY EXAMINATION – DECEMBER 2018		Write Your Roll No:_____	
B.TECH.-ECE	SEMESTER-7TH	TIME - 3 Hours	MAX. MARKS-75
COURSE NO. - ECE-431	COURSE TITLE - Robotics		

Note: All questions in Part-A and Part-B are compulsory. Attempt any four questions from Part-C selecting at least one from each unit.

PART-A (15 Marks)

Q. No. – 1 Answer the following questions. **15x1 = 15**

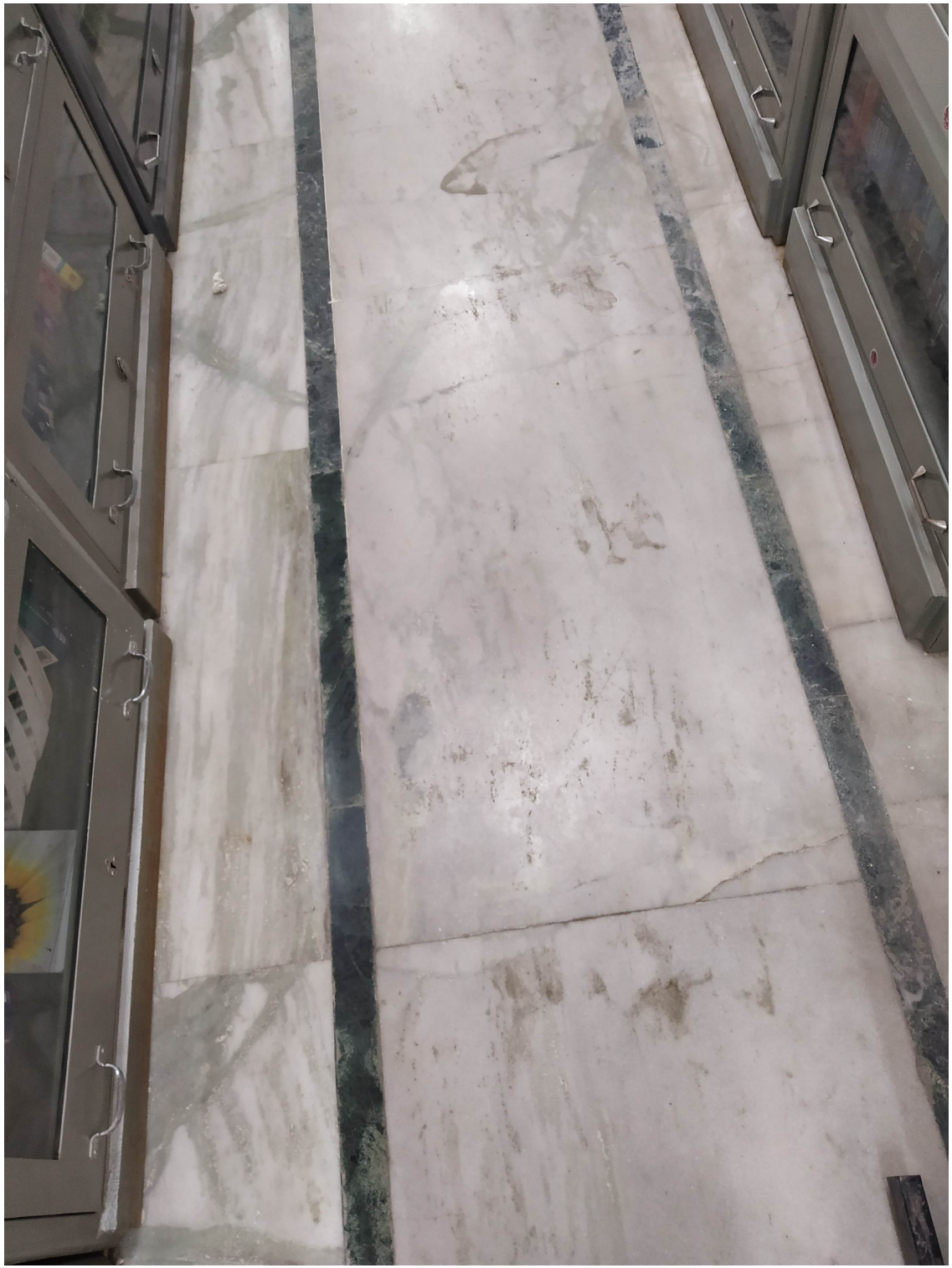
(i)	What is a robot and automation? Give an example for each.
(ii)	Write conversion formulas for step angle to step per revolution and sps to rpm.
(iii)	What kind of power sources are used for industrial robots?
(iv)	What is an end effectors and what function does it serve?
(v)	What is an RCC and IRCC devices?
(vi)	What is sensor and what are the basic reasons sensors are used in a workcell?
(vii)	What purpose do internal, external and interlock sensors serve in a robot?
(viii)	What is the function of sniff sensors?
(ix)	List the six different types of proximity sensors with their uses.
(x)	What is the purpose of vidicon cameras and solid-state cameras?
(xi)	What is a computer numerical control? How is an industrial robot similar to numerical control?
(xii)	Why are expert systems called "expert"? Comment on their capabilities.
(xiii)	What are the two advantages of using computer-based programming terminals?
(xiv)	What are the two main robot programs and what are their functions?
(xv)	What are robot safety standards and who are the trade associations dedicated to their promotion?

PART-B (20 Marks)

	UNIT-I	
2	Draw the block diagram of servo system. Explain the working operation of servo motor control. What are the advantages and disadvantages of closed loop control?	5
	UNIT-II	
3	Describe how touch and tactile sensors operates?	5
	UNIT-III	
4	What is artificial intelligence? Describe the elements of AI and its use in industry.	5
	UNIT-IV	
5	Describe briefly the impact of automation in manufacturing and result of this significant progress.	5

PART-C (40 Marks)

	UNIT-I	
6	Describe briefly different basic components of an industrial robot?	**10**
7	Compare the five styles of manipulators according to the advantages and disadvantages of each configuration, work envelope, and typical applications.	**10**
	UNIT-II	
8	Describe the function and uses of following sensors: (i).Resolvers (ii) Strain Gauge (iii) Micro switches (iv) Taste sensors	**10**
9	Describe briefly the operation of a machine-vision system?	**10**
	UNIT-III	
10	Draw the block diagram of PLC. Explain the function of each components of a PLC.	**10**
11	Explain different methods used to enter the programming command into the controller memory.	**10**
	UNIT-IV	
12	Describe the industrial robot applications of material-handling, processing operations, and assembly operations?	**10**
13	Explain what are the future applications of robots? Why should we challenge the future of technology and what is considered a safe, healthy, and efficient automated workplace?	**10**



B Tech ECE 7th

(10)

16

University Institute of Engineering & Technology

(Recognised Under Section 2(f) and 12B of UGC)

Kurukshetra University, Kurukshetra

Roll No. -

THEORY EXAMINATION – DECEMBER 2017	TIME – 3 Hrs.
B.TECH - ECE	SEMESTER – 7th

M.M. - 75

COURSE NO. - ECE-401

COURSE TITLE - Microcontroller and Embedded System Design

Note: All questions in Part-A and Part-B are compulsory. Attempt any four questions from Part-C selecting at least one from each unit.

PART-A (15 Marks)

Q. No. – 1 Answer the following questions. **15x1=15**

(i)	Define an Embedded System. Give an example.
(ii)	List different microprocessor and Microcontroller embedded into a system.
(iii)	Explain purpose of reset circuit, Power-up-reset and watchdog-timer reset.
(iv)	List applications of Embedded System.
(v)	No. of address lines are required to address 2K x 8 bit memory.
(vi)	Explain purpose of PSW register.
(vii)	What are the uses of timers of 8051 microcontrollers?
(viii)	Define the term Interrupt, Interrupt Service Routine, and Interrupt Vector Table.
(ix)	Discuss what happens if interrupts INT0, TF0 and INT1 are activated at the same time.
(x)	Explain function of IE register.
(xi)	What is an assembler directive? List most common assembler directive.
(xii)	Differentiate between mnemonics MOV, MOVX and MOVC.
(xiii)	What is meant by term "addressing modes"? List addressing modes supported by the 8051 with suitable example.
(xiv)	A stepper motor has a step angle of 2°, the number of pulses required to rotate the motor by 360° is.
(xv)	What are the applications of ADCs and DACs?

PART-B (20 Marks)

	UNIT-I	
2	Explain how RISC core improve the performance of a microcontroller?	5
	UNIT-II	
3	Briefly explain function of $\overline{EA}$, $\overline{PSEN}$, ALE pins of 8051 microcontroller.	5
	UNIT-III	
4	Discuss core features and peripheral features of PIC16C74 microcontroller.	5
	UNIT-IV	
5	Interface a 4x4 matrix keyboard with 8051 microcontroller and discuss step by step procedure to detect the key press (key closure) and key identification.	5

PART-C (40 Marks)

	UNIT-I	
6	(a). Explain what are the different ways of classifying the microcontrollers? (b). With the help of diagram, explain why 'Harvard architecture' is more preferred over 'Princeton architecture'?	10
7	Discuss design process of 'Automatic Chocolate Vending Machine' (ACVM).	10
	UNIT-II	
8	Design architectural block diagram and explain various features of 8051 microcontroller.	10
9	Briefly explain purpose and function of each flags of following registers: (i). TCON (ii). TMOD (iii). SCON (iv).PCON	10
	UNIT-III	
10	Write program; calculate result and flags affected, using two 16-bit numbers 42E1H and 255CH for the following operation: (i). Add (ii). Subtract	10
11	Write a program to transfer the message "YES" serially at 9600 baud, 8-bit data, 1 stop bit. Do this continuously.	10
	UNIT-IV	
12	Interface 16 x 2 LCD module with the 8051 microcontroller and develop a program to display message 'NO' (by sending command and data to LCD using time delay).	10
13	Draw interfacing diagram to connect the microcontroller 8051 with DC motor. Assume a switch SW (ON-OFF) is connected to port P2.0.Write a program to monitor the status of switch. If it is Low, apply 25% DC power, otherwise, apply 50% power to the motor using PWM technique.	10

15

University Institute of Engineering & Technology

(Recognised Under Section 2(f) and 12B of UGC)

Kurukshetra University, Kurukshetra

Roll No. -

THEORY EXAMINATION – DECEMBER 2017	
B.TECH - ECE	SEMESTER - VII

TIME – 3 Hrs.

M.M. - 75

COURSE NO. - ECE-403

COURSE TITLE - DIGITAL IMAGE PROCESSING

Note: All questions in Part-A and Part-B are compulsory. Attempt any four questions from Part-C selecting at least one from each unit.

PART-A (15 Marks)

Q. No. – 1 Answer the following questions. 15x1=15

(i)	What do you mean by image enhancement?
(ii)	Define image fidelity.
(iii)	Describe sampling theory.
(iv)	What is image quantization?
(v)	What do you understand by spatial operations?
(vi)	What do you understand by transform operations?
(vii)	Define histogram.
(viii)	What is image segmentation?
(ix)	Differentiate between the edge and the boundary of an image.
(x)	What are shape features?
(xi)	Describe the image perception.
(xii)	What do you mean by image reconstruction?
(xiii)	Differentiate between colour image enhancement and gray scale image enhancement.
(xiv)	What is histogram equalization?
(xv)	Name some point operations.

PART-B (20 Marks)

	UNIT-I	
2	Explain the image data compression techniques.	5
	UNIT-II	
3	Discuss the practical limitations in image sampling and reconstruction.	5
	UNIT-III	
4	Describe the multispectral image enhancement.	5
	UNIT-IV	
5	Describe some spatial feature extraction techniques.	5

PART-C (40 Marks)

	UNIT-I	
6	What is digital image processing? Draw the block diagram of digital image processing and explain its applications.	10
7	Describe the colour vision model in detail.	10
	UNIT-II	
8	Explain Lloyed-Max quantizer.	10
9	Discuss the 2-dimensional sampling theorem for image processing. Explain the process in context with image reconstruction.	10
	UNIT-III	
10	Discuss some spatial and transform operations in detail for image enhancement.	10
11	Explain colour image enhancement operations.	10
	UNIT-IV	
12	Describe some edge detection techniques in detail.	10
13	Discuss some boundary extraction techniques in detail.	10

University Institute of Engineering &
(Recognised Under Section 2(f) and 12B of UGC)
Kurukshetra University, Kurukshetra

Roll No. -

THEORY EXAMINATION – DECEMBER 2017

TIME – 3 Hrs.

B.TECH - ECE	SEMESTER - VII

M.M. - 75

E NO. –ECE-405 | COURSE TITLE - POWER ELECTRONICS

ote: All questions in Part-A and Part-B are compulsory. Attempt any four questions from art-C selecting at least one from each unit.

PART-A (15 Marks)

Q. No. – 1 Answer the following questions. 15x1=15

(i)	Explain the term Thyristor. What are its various types ?
(ii)	Explain the significance of Latching current ?
(iii)	Explain the significance of Power MOSFET over conventional ?
(iv)	Explain the principle of operation of Cycloconverter.
(v)	Explain the significance of Firing Angle.
(vi)	Discuss, how gate triggering is done in Thyristors ?
(vii)	Explain how Power diode is different from normal p-n diode?
(viii)	Draw the firing circuit of Thyristor.
(ix)	What are the various types of Thyristor Commutations?
(x)	Define Holding current ?
(xi)	What are the various methods of Thyristor Triggering?
(xii)	Define Forward Break Over voltage of SCR.
(xiii)	Define the term Thyristor protection.
(xiv)	What is the principle of operation of Chopper?
(xv)	Differentiate between series and parallel operation of a Thyristor ?

PART-B (20 Marks)

	UNIT-I	
2	Describe the basic structure of a Power Diode and describe its VI characteristics.	5
	UNIT-II	
3	Explain the terminal characteristics and switching characteristics of the Thyristors.	5
	UNIT-III	
4	Describe the principle of operation of Phase Controlled Rectifiers with suitable diagram.	5
	UNIT-IV	
5	Explain the principle of operation of single phase AC voltage controller with R load.	5

PART-C (40 Marks)

	UNIT-I	
6	Explain the various Power semiconductor devices ? Describe the VI characteristics of Power MOSFET .	10
7	Explain the significance of Power electronics Converters ? Analyse their relative advantages and disadvantages.	10
	UNIT-II	
8	Explain the two-transistor model of a Thyristor with suitable diagram. Distinguish Between various firing and commutation methods of the Thyristor.	10
9	Distinguish between Class A, B, C and D commutation circuits of Thyristors.	10
	UNIT-III	
10	Discriminate between single phase symmetrical and asymmetrical semi Converters.	10
11	Distinguish the various types of Chopper circuits. Describe in detail the principle of working of step-up Choppers?	10
	UNIT-IV	
12	Illustrate the main application of Cycloconverter? Differentiate between the principle of operation of step-up and step-down Cycloconverters.	10
13	Develop and derive the output Voltage equation for a Cycloconverter.	10