Code No. 6275 / O

FACULTY OF ENGINEERING

B.E. 4/4 (ECE) II - Semester (Old) Examination, April / May 2014

Subject : Systems Automation and Control (Elective – III)

Time : 3 Hours

Max. Marks: 75

Note: Answer all questions of Part - A and answer any five questions from Part-B. **PART – A** (25 Marks)

1	Write about light sensors.	(3)
2	Does a straingage bonded to a component have any influence on the stresses that	(3)
3	An inverting amplifier has an input impedance of 2 kQ. Determine the feedback	(3)
•	resistance needed to give a voltage gain of 100.	(2)
4	What is an Instrumentation Amplifier?	(3)
5	Propose a model for the metal wheel of a railway carriage running on a metal track.	(2)
67	Differentiate between armature controlled and field controlled DC motor.	(3)
1	6 What is the form of differential equation for this system?	(2)
8	Define gain margin and phase margin.	(2)
9	Write the program instructions for the program given as .	(2)
	11×400 T450 7430 11-1450 11-1450 11-1450 11-1450 11-1450 1-14500 1-1450 1-14500 1-14500 1-14500 1-14500 1-14500 1-14500 1-14500	
10	What are the configurations in operating stepper motor?	(3)
	PART – B (50 Marks)	
11	(a) Explain the static (steady state) characteristics of transducers.(b) What are the advantages and disadvantages of plastic film type of potentiometer compared with the wire wound potentiometer?	(6) (4)
12	(a) How is an OPAMP used as a (i) Integrator (ii) Differentiator	(6)
	(b) Explain briefly flash type A/D converter.	(4)
13	Describe and compare the characteristics of (a) Proportional control (b) Proportional plus integral control (c) Proportional plus integral plus derivative control	(10)
14	(a) Derive differential equations for a permanent magnet DC motor.(b) Explain building – block for thermal system.	(6) (4)
15	Explain the basis of ladder programming used in PLC.	(10)
16	With necessary diagrams, explain automatic car parking system.	(10)
17	Write short notes on the following: (a) Various movements of robots (b) Stages in designing a mechatronic systems	(10)

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FACULTY OF ENGINEERING

B.E. 4/4 (ECE) II - Semester (Old) Examination, April / May 2014

Subject : Television Engineering (Elective-III)

Time : 3 Hours

Max. Marks: 75

(10)

Note: Answer all questions of Part - A and answer any five questions from Part - B. PART – A (25 Marks)

1	Why FM is preferred to AM for sound signal transmission?	(2)
2	Justify the choice of rectangular frame with width to height ratio of 4/3 for television	
	transmission and reception.	(2)
3	Why are the front porch and back porch intervals provided before and after the	
	horizontal sync pulse?	(2)
4	Write the differences between image orthicon, vidicon and plumbicon camera tubes.	(3)
5	Explain negative modulation in television system.	(2)
6	Draw and explain the basic circuit of EHT supply.	(3)
7	Explain the terms Hue, saturation, luminance and chrominance.	(3)
8	Mention the advantages and disadvantages of PAL system.	(3)
9	Write the special features of HDTV system.	
10	What are the salient features of TV receiver?	(2)
PART – B (50 Marks)		

11	What do you understand by interlaced scanning ? Show that it reduces flicker and conserve bandwidth.	(10)
12	Sketch composite video signal waveform for atleast three successive lines and indicate.	(10)
	(a) Extreme white level (b) Blanking level	
	(c) Pedestal height (d) Sync pulse level	
	And Justify the choice of $P/S = 10/4$.	
13	Draw the cross-sectional view of image orthicon camera tube and explain how it	

- 13 Draw the cross-sectional view of image orthicon camera tube and explain how it develops video signal when light from any scene is focused on its face plate. (10)
 14 With a neat block diagram, explain the operation of TV transmitter. (10)
- 15 Explain with a suitable block diagram the encoding process in the PAL colour
- system. Why is the colour burst signal transmitted after each scanning line. (10)
- 16 Draw the layout of a typical television studio and explain how the picture and sound signals are processed in the control room.

17	Write short notes on the following:		
	(a) TV transmitting aerial	(b) CATV	(5 + 5)

Code No. 6535 / N

FACULTY OF ENGINEERING

B.E. 4/4 (ECE) II - Semester (New) (Main) Examination, May 2014

Subject : Nano Technology (Elective – III)

Time : 3 hours

Max. Marks: 75

2

3

2

Note: Answer all questions from Part-A. Answer any FIVE questions from Part - B. PART – A (25 Marks)

- 1 Give examples of a quantum dot.
- 2 What are the major disadvantages of infrared spectroscopy?
- 3 What is meant by top-down and bottom-up approaches?
- 4 What are the uses of TEM in the study of nanosystems?
- 5 List out the methods used for preparing carbon nanotubes.
- 6 What are the architectural characteristics of carban nanotubes?
- 7 Why objects in nanoscale can not be seen by the visible light?
- 8 What are the characteristics of electromagnetic radiation?
- 9 List out the applications of nanotechnology.
- 10 What are nano sensors?

PART – B (50 Marks)

11	 a) Explain size dependence of properties of structures. b) What do you mean by quantum data? Explain tetrahedrally banded comisenducts 	
	structures.	5
12	 a) Compare electrostatic force microscope and magnetic force microscope. b) Describe in detail Fourier transform infrared spectrum. 	5 5
13	 a) Classify electromechanical systems and explain. b) List out the applications of NMEMS and explain any one in detail. 	5 5
14	Explain molecular circuit and schematics of electron orbital energy levels for polyphenylene based molecular rectifying node.	10
15	Describe three layer hierarchically distributed architecture for large scale multimode NEMS and MEMS.	
16	Explain carbon nanotubes and its applications in detail.	10
17	Write short notes on :	

- a) Photoemission and X-ray spectroscopy
- b) Preparation of quantum nanostructures

Code No. 6536 / N

FACULTY OF ENGINEERING

B.E. 4/4 (ECE) II - Semester (New) (Main) Examination, April / May 2014

Subject : Global Positioning System (Elective – III)

Time : 3 hours

Max. Marks : 75

Note: Answer all questions from Part-A. Answer any FIVE questions from Part - B. PART - A (25 Marks)

1 2	What is GPS? Define Julian Day.	2 2
3	What are the various error sources in GPS?	3
4	What is mean by global coordinate system?	2
5	Differentiate B/W (between) Spoofing and Anti Spoofing.	3
6	Write some GPS data formats.	3
7	Mention the new GPS signals and their frequencies that are planned to be introduced in	_
-	near future.	2
8	What is the principle of DGPS?	3
9	What is the orbital period for GLONASS system?	2
10	write operating frequencies for GALILEO system.	3
	PARI - B (30 Marks)	
11	Derive an expression for satellite position in the orbital coordinate frame.	10
12	a) Write about GPS system architecture?	5
	b) Write the factors affecting the DOP.	5
13	Explain about	10
	a) Conventional Terrestrial Reference System	
	b) Conventional Inertial Reference system	
14	Write about code phase measurements	10
• •		10
15	Write about RINEX observation and navigation data formats.	10
16	Explain about GAGAN architecture and its implement.	10
17	Write short notes on each for various types of GPS integration systems.	10

Code No. 6537 / N

FACULTY OF ENGINEERING

B.E. 4/4 (ECE) II - Semester (New) (Main) Examination, May 2014

Subject : Neural Networks and Fuzzy Logic (Elective – III)

Time : 3 hours

Max. Marks : 75

Note: Answer all questions from Part-A. Answer any FIVE questions from Part - B. PART – A (25 Marks)

- 1 Describe the basic model of a neuron.
- 2 Define Hebbian learning rule.
- 3 Explain in brief the ADALINE network.
- 4 How are weights assigned in BAM network?
- 5 List out the applications of neural networks.
- 6 Explain self organizing model.
- 7 Explain fuzzy sets and its operation.
- 8 Define linguistic variables.
- 9 What are fuzzy integrals?
- 10 Explain how stability is attained in fuzzy control system.

PART – B (50 Marks)

11	a)	Explain with a neat diagram the functionality of a biological neuron.	5
	b)	Explain MC Culloach pits model with a diagram.	5
12	a)	Explain back propagation algorithm and discuss its limitations.	5
	b)	Explain the BAM algorithm. What are its advantages?	5
13	Exp	plain the Hopfield networks with its topology algorithm and applications.	10
14	a)	Explain fuzzy sets and discuss the properties of fuzzy sets.	5
	b)	Explain about fuzzification and defuzzification in detail.	5
15	a)	Explain the basic structure and operation of fuzzy logic control system.	5
	b)	List out the applications of fuzzy control system.	5
16	a)	Draw the diagram of ADALINE networks and explain the algorithm.	5
	b)	Discuss about recurrent neural networks.	5

- 17 Write short notes on any two :
 - a) Radial basis function networks
 - b) Applications of neural networks in Robotics
 - c) Max min, Max product composition on fuzzy relations.