UNIVERSITY OF PUNE

[4364]-542

B. E. (Electronics) Examination - 2013

VLSI Design

(2008 Pattern)

Total No. of Questions : 12 **[Total No. of Printed Pages :3]**

[Time : 3 Hours] **[Max. Marks : 100]**

Instructions

*(1) Answer **any 3** questions from each section.*

*(2) Answer **3** questions from Section I and Answer **3** questions from Section II*

*(3) Answers to the **two sections** should be written in **separate answer-books**.*

(4) Neat diagrams must be drawn wherever necessary.

(5) Black figures to the right indicate full marks.

(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

Q1.

a) What is velocity saturation and hot electron effect?

What are their effects? [8]

b) Derive the expressions for Static and Dynamic power dissipations. Compare them. [8]

OR

Q2.

a) Design 4:1 multiplexer using Transmission gate and compare it with conventional method. [8]

b) Why is device sizing so important? Prove that Wp=2.5Wn [8]

Q3.

a) Explain read/write operation of 6T SRAM cell with the help of timing diagrams. [8]

b) Differentiate between SRAM & DRAM technologies. [8]

OR

Q4.

a) Draw the schematic of DRAM cell with the necessary peripherals and explain read/write cycles with the help of timing diagrams. [8]

b) Give the classification of memory with the application each. [8]

Q5.

a) Write a VHDL code for MOD 6 UP/DOWN counter. Also write test bench for it. [9]

b) With suitable examples explain delta delay, inertial delay and transport delay. [9]

OR

Q6.

a) Write a VHDL code for 4:16 DECODER using structural modeling. Also write test bench for it. [9]

b) Explain the utilities of package declaration and package body. Give suitable example. [9]

SECTION II

Q7.

a) Draw the block diagram of CPLD and explain in detail its architecture. [8]

b) Differentiate between FPGA & CPLD. [8]

OR

Q8.

a) Draw the block diagram of FPGA and list its specifications. [8]

b) Explain how half adder logic gets implemented in FPGA and CPLD differently. Explain with suitable schematic [8]

Q9.

a) Explain with block diagrams: Full & Partial Scan path arrangements. [8]

b) What are the different fault models? Explain in detail. [8]

OR

Q10.

a) What is the need of design for testability? With schematic explain different Faults. [8]

b) What is meta-stability? What are the solutions? Draw the necessary schematic. [8]

Q11.

a) What are the challenges in routing? Explain global routing. [9]

b) Draw and explain the off chip connectivity. Why is it so important? What are the techniques? [9]

OR

Q12. Write short notes on the following: [18]

a) Power distribution and optimization.

b) Two phase clocking and clock distribution.

UNIVERSITY OF PUNE

[4364]-551

B. E. (*Electronic Engineering*) Examination - 2013

Robotics & Industrial Automation

(*2008* Course) (Elective-IV)

[Total No. of Questions: *12***]** **[Total No. of Printed Pages :***3***]**

[Time : *3* **Hours]** **[Max. Marks : 100]**

Instructions :

(1) Answer any 3 question 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) Use of logarithmic tables, slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.

(6) Assume suitable data, if necessary.

SECTION-I

Q1	A	Explain the term Work envelop & Work Volume For the following types of robot.	
	1	Cartesian robot	
	2	Cylindrical robot	
	3	Spherical robot	
		Explain the significance of these terms with respect to industrial applications.	10
	B	Explain six degree of freedom associated with the robot?	8

OR

Q2	A	Draw neat sketch showing basic components of Robot system & Explain function of each. Explain the term Degree of freedom related to Robot.	10
	B	Discuss various specification of Robot system in details (any 2)?	8
Q3	A	Explain in details what do you mean by forward kinematics &	8

		reserve kinematics?	
	B	Define Dynamics? Explain the term robot arm dynamics explain advantages of Kane's method used for formulation of dynamical equations.	8
		OR	
Q4	A	What is D-H representation? Discuss D-H Algorithm	8
	B	Write short note on Newton's equation, Euler's equation?	8
Q5	A	List different types of sensors used in robotics? Explain any 2 with neat diagram	8
	B	Write short note on different types of grippers used in robotics?	8
		OR	
Q6	A	Draw & explain four bar mechanism, rack & pinion mechanism?	8
	B	Write short note on (any-2)	8
	1)	Gyroscopes	
	2)	Accelerometer	
	3)	Proximity sensors	
		SECTION-II	
Q7	A	Draw he block diagram of fuzzy controller & explain.	8
	B	Discuss Jacobian for robotics	8
		OR	
Q8	A	Explain with the block diagram different parameters involved in trajectory planning problem? Explain different Steps in Trajectory planning.	8
	B	Explain pick & place operation for robot?	8
Q9	A	Discuss design consideration for vision sensors used in robotics?	8
	B	Explain industrial applications of vision controlled robotics system.	8

OR

Q10	A	With the help of block diagram explain components of video analytics system.	8
	B	Write short notes on	8
	1)	Object recognition	
	2)	Motion detection	
Q11		Write short notes on	18
	A	Different feedback sensors used in robotics.	
	B	Welding automation using robot.	
	C	Inspection system using robot	

OR

Q12	A	Write short note on roll of robotics in industrial automation.	8
	B	Write short note on	10
	1)	Need of automation in industry & relation of automation with productivity.	
	2)	Automatic part inspection using robot.	

[Total No. of Questions:12] **[Total No. of Printed Pages: 2]**

UNIVERSITY OF PUNE

[4364]-557

B. E. (Electronic Engineering) **(Semester II)**

Examination - 2013

SOFT COMPUTING TOOLS (Elective III)(2008 Course)

[Time: *3* Hours] **[Max. Marks: 100]**

Instructions:

1 ***Answer 3*** *questions* ***from Section I and 3*** *questions* ***from Section II***
2 *Answers to the* ***two sections*** *should be written in* ***separate answer-books***.
3 *Neat diagrams must be drawn wherever necessary.*
4 *Use of logarithmic tables, slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.*
5 *Assume suitable data, if necessary.*

SECTION -I

Q.1 A Define Soft Computing? Compare the performance of a computer and that of a biological neural network in terms of speed, processing, size and complexity, storage, fault tolerance and control mechanism. 8

B Write short notes on- 8
i) Hybrid Systems
ii) Neuro - Fuzzy and soft Computing characteristics

OR

Q.2 A Describe in detail fuzzy sets and membership functions. What are different set theoretic operations. 8

B Consider the fuzzy sets X and Y. find algebraic sum, algebraic product, bounded sum and bounded difference 8

$$X = \left\{\frac{0.1}{0} + \frac{0.2}{1} + \frac{0.3}{2} + \frac{0.4}{3} + \frac{0.5}{4}\right\}$$

$$Y = \left\{\frac{0.5}{0} + \frac{0.4}{1} + \frac{0.3}{2} + \frac{0.2}{3} + \frac{0.1}{4}\right\}$$

Q. 3 A Consider the fuzzy sets given by- 10

$$A = \left\{\frac{1}{low} + \frac{0.2}{medium} + \frac{0.5}{high}\right\}$$

$$B = \left\{\frac{0.9}{positive} + \frac{0.4}{zero} + \frac{0.9}{negative}\right\}$$

Find the fuzzy relation R for the Cartesian product of A and B. $A \times B$

If fuzzy set C given by-

$$C = \left\{\frac{0.1}{low} + \frac{0.2}{medium} + \frac{0.7}{high}\right\}$$

Find fuzzy relation S between C and B using Cartesian product. $C \times B$ Also find relation between R and C using max-min composition.

B Define and explain following terms for fuzzy sets- 6
i) Crossover point ii) Bandwidth

iii) Linguistic variable iv)open left, open right, closed.

OR

Q. 4	A	Explain any four fuzzy membership functions with their transfer characteristics.	8
	B	What is Fuzzy Reasoning? Discuss in detail the fuzzy reasoning for i) Multiple rules with multiple antecedents ii) Single rule with multiple antecedents	8
Q. 5	A	Draw and explain block diagram of fuzzy logic controller. What are the steps involved in designing a fuzzy logic controller.	10
	B	What are the advantages of fuzzy logic controller over that of a conventional controller	8

OR

Q. 6	A	Write notes on (any three) i) Synthesis and validation of fuzzy controller ii) Mamdani inference system iii) Sugeno Model iv) Tsukamoto model	18

SECTION II

Q. 7	A	State the various learning rules in neural networks.	8
	B	Using Mc-Culloch-Pitts neuron, implement XOR function. (Consider binary data)	8

OR

Q. 8	A	Train a perceptron for learning binary AND gate function.	8
	B	Explain the architecture and training algorithm used in Adaline	8
Q. 9	A	Explain the application of neural network in communication field.	8
	B	Describe the self organizing map architecture and explain the Kohonen model.	8

OR

Q. 10	A	List the applications of artificial neural networks and explain any two in detail.	16
Q. 11	A	Explain the equivalence between ANFIS and RBFN with conditions.	8
	B	Explain adaptive neuro fuzzy inference system (ANFIS) with architecture.	10

OR

Q. 12	A	Write short notes on (any three) i) Use of ANN in process control ii) Hybrid learning algorithm iii) Advantages of ANFIS over FIS iv) Radial basis function network.	18

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[4364]-541

B. E. Examination - 2013

Electronics System Design

(2008 Course)

Total No. Of Questions: 12 **[Total No. Of Printed Pages: 3]**

[Time: 3 Hours] **[Max. Marks: 100]**

Instructions:

*(1) Answer **three questions** from each section 1 and **three qusetion** from section 2.*

*(2) Answers to the **two sections** should be written in **separate books**.*

(3) Figures to the right indicate full marks.

(4) Neat diagrams must be drawn wherever necessary.

(5) Use of pocket calculator is allowed.

(6) Assume suitable data, if necessary.

SECTION-1

Q. 1. A) Explain the Pilot Production. Why it is necessary in Electronics Product design. (8)

B) State the criteria for selection of frequency bands requirements of Voice and multimedia application. (8)

OR

Q. 2. A) How will you increase the reliability of the system. Difference MTBT and MTTF (8)

B) Explain Industrial product design with the help of case study in detail Explain their classification. (8)

Q. 3. A) Explain different performance factor of DAC. (10)

B) Explain following ADC characteristic: (10)

1. Full-scale-input-range
2. Number of bits
3. Analog and /or digital gain capability
4. Power consumption
5. Through-put timing

OR

Q. 4. A) Explain the following in terms of DAC (10)

I. Resolution
II. Maximum sampling rate
III. Monotonicity
IV. Total harmonic distortion and noise
V. Dynamic rang

B) Take one example of typical instrumentation amplifier and do its error budget analysis (8)

Q. 5. A) Explain the selection of microcontroller for particular DAS Application. Justify selection based on number of IOs (8)

B) Explain the advantage /disadvantages of serial interfacing over Parallel interfacing with microcontroller. (8)

OR

Q. 6. A) Interface hex keypad, LCD, DAC, ADC, four relays with Microcontroller can we interface? If yes draw circuit diagram of no suggest suitable adjustment and draw circuit diagram. (16)

SECTION-2

Q. 7. A) Explain different phase of software design (8)

B) Write noted on- (10)

i. Compiler
ii. Emulator
iii. Simulator
iv. Assembler

Q. 8. A) Write notes on debugging tools and techniques for software (8)

B) Explain the factors that determine the choice between developing Software – (10)

i. Assembly language
ii. High level language

Q. 9. A) What are the different PCB Design issues of analog and mixed signal Circuits. Explain in details. (8)

B) What is EMC and EMI. What are the standards. (8)

OR

Q. 10. A) What are the different PCB Design issues of high speed integrated Circuits. Explain the details. (8)

B) Write a notes on SHIELDING and GUARDING (8)

Q. 11. A) Write a notes on (8)

i. Logic Analyzer ii. Mixed single oscillsocopes

B) Why environmental tasting is necessary? How it is carried out? Explain different factors in detail (8)

OR

Q. 12. A) Carried out DC analysis of any circuit, comment on the stability (8)

B) Explain the mechanism by which the product is either a case for EMI/EMC or not. (8)

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B. E. Electronics Examination - 2013

Advanced Computer Architecture

(2008 Course)

Total No. of Questions : 12 **[Total No. of Printed Pages :3]**

[Time : 3 Hours] **[Max. Marks : 100]**

Instructions :

(1) Solve Q.1 or Q.2,Q.3 or Q.4,Q.5 or Q.6 from section I and Solve Q.7 or Q.8, Q.9 or Q.10,Q.11 or Q.12 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) Assume suitable data, if necessary.

SECTION-I

Q. 1. A) Explain parallel and sequential constructs used in OCCAM Language. (4)

B) How parallelism is achieved in uniprocessor system? (6)

C) Explain different applications of parallel processing. (6)

OR

Q. 2. A) Describe parallel processor approach in uniprocessor. (8)

B) Discuss Feng's classification of parallel computer architecture. (8)

Q. 3. A) How the performance of pipeline processor is measured? (6)

B) Explain job sequencing and collision prevention in pipeline Processor. (6)

C) Explain important architectural features of EPIC. (6)

OR

Q. 4. A) Describe various pipeline hazards. Give hazard detection and Resolution techniques. (8)

B) Describe ultra-SPARC processor architecture with block diagram And features. (10)

Q. 5. A) How does vectorization work? Explain any two vector optimizing Functions. (8)

B) Explain various issues in vector processing. (8)

OR

Q. 6. A) Write short note on : CRAY architecture. (8)

B) Explain the terms : (8)

i. Pipeline chaining
ii. Vector loops

SECTION-II

Q. 7. A) Write a short note on interconnection network of SIMD. (8)

B) Explain the sorting algorithm for array processor. (8)

OR

Q. 8. A) Explain SIMD architecture. (8)

B) Explain the FFT algorithm for array processor. (8)

Q. 9. A) What is memory contention? Explain any three techniques for Reducing memory contention. (10)

B) Differentiate between loosely coupled and tightly coupled Multiprocessor architecture. (8)

OR

Q. 10. A) Explain different methods used to avoid cache coherence problem. (4)

B) Explain different arbitration techniques. (6)

C) Explain the architecture of IBM power4 processor. (8)

Q. 11. A) Write short note on : multithreaded architecture. (8)

B) Discuss in detail latency hiding techniques in multithreaded architecture. (8)

OR

Q. 12. A) What are the issues involved in multithreaded architecture? (8)

B) Differentiate between : (8)

i. Shared memory programming and message passing programming
ii. Synchronous and asynchronous message passing

PUNE UNIVERSITY

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B. E. (Electronics), Examination-2013

Process Automation (2008 Pattern)

[Total No. of Questions: 12] **[Total No. of Printed Pages: 3]**

[Time: 3 Hours] **[Max. Marks: 100]**

Instructions:

*(1) Answer **three** questions from each section.*

*(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 logarithmic tables, slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.

(6) Assume suitable data, if necessary.

SECTION-I

Q1	A	Explain the following control system evaluation criteria.	8
	i.	Minimum area	
	ii.	Quarter amplitude	
	B	List various instrumentation standard signals. Draw a P & I diagram for a simple flow control loop and explain the role of DPT, square root extractor and E to P converter.	8
		OR	
Q2	A	Explain with suitable example following process characteristics:	8
	i.	Process Equation	
	ii.	Process Load	
	iii	Process lag	
	iv	Self Regulation	
	B	Explain with suitable example process control block diagram	8
Q3	A	Explain the following discontinuous controller modes.	8
	i.	Two position	
	ii.	Three position	
	iii	Single speed floating control	
	iv	Multiple speed floating control	
	B	Explain process reaction method of process loop tuning.	10

OR

Q4 A List various continuous and composite controller modes. What is offset error? Explain how integral action can eliminate the offset error. 8

B State the equation for a proportional derivative controller. Explain a OP-AMP based proportional derivative (PD) mode controller. 10

Q5 A Explain different types of control valve noise. 10

B Define valve sizing coefficient C_v. Find the proper C_v and the required valve size for a valve must allow 150 gpm of ethyl alcohol with a specific gravity of 0.8 at maximum pressure of 50psi. Use the following control valve flow coefficient table. 6

Valve size inches	Cv
$^1/_4$	0.3
$^1/_2$	3
1	14
$1\,^1/_2$	35
2	55
3	108
4	174
6	400
8	725

OR

Q6 A Draw control valve characteristics and explain following terms. 10

i. Quick Opening

ii. Linear

iii Equal percentage valve

B Define the term rangeability. An equal percentage valve has a maximum flow of 100 cm^3/s and a minimum of $4cm^3/s$. If the full travel is 3 cm, find the flow at a 2cm opening. 6

SECTION-II

Q7 A Explain feedback control scheme for a steam heated heat exchanger. 8

B Why are adaptive controllers needed? Explain programmed or scheduled adaptive control. 8

		OR	
Q8	A	Explain with neat block diagram the concept of internal model control (IMC).	8
	B	What is selective control? Explain with example override control for the protection of process equipment.	8
Q9	A	Explain feed-forward control for the composition of overhead and bottoms product in a distillation column.	10
	B	Explain classification of industrial robots. List various applications of robots.	8
		OR	
Q10	A	Draw & explain the P&I diagram for cascade control of multiple effect evaporator.	10
	B	Explain Air: Fuel ratio control to maximize combustion efficiency for a burner in a boiler.	8
Q11		Write short notes on	
	A	Alarm Annunciator	8
	B	Strip chart recorder	8
		OR	
Q12	A	Explain with block diagram Distributed control system	8
	B	Explain with neat diagram working principle of a flow totalizer	8

UNIVERSITY OF PUNE
[4364]-543
B. E.(Electronics Engineering)Examination - 2013
EMBEDDED SYSTEM(404203)
(2008 Pattern)

[Total No. of Questions:12] **[Total No. of Printed Pages :3]**
[Time : 3 Hours] **[Max. Marks : 100]**

Instructions :

*(1) Answer **any three** questions from each section.*
*(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 non programmable electronics pocket calculator is allowed.
(6) Assume suitable data, if necessary.

SECTION-I

Q1 a) Explain the role Integrated Development Environment (IDE) in design of Embedded System application. [8]

b) Explain need for different communication protocols in embedded applications. [8]

OR

Q2 a) Explain the software architectures commonly used in Embedded Systems. [8]

b) Explain the Design Metrics and give significance of losses due to delayed market entry. [8]

Q3 a) What is significance of interrupt in embedded application development and also explain the role of Interrupt Vector address and Interrupt Service Routine. [10]

b) Explain various processor technologies. [8]

OR

Q4 a) Explain Memory selection criteria and interfacing aspects for Embedded application. [8]

b) Explain different Embedded processor and give one of the internal Architecture of Embedded processor. [10]

Q5 a) Draw and explain the block diagram of LPC2148 [8]

b) State different on chip peripherals of LPC2148 and describe their significance. [8]

OR

Q6 a) Explain ARM 7 operating modes. [8]

b) Explain the privileged and Non-privileged modes of operation in ARM 7 processor. [8]

SECTION-II

Q7 a) Explain on chip ADC/DAC of LPC is 2148 also write a program for ADC interfacing to display analog input on LCD [10]

b) Explain the tool chain for programming using Embedded C [8]

OR

Q8 a) Write and explain the code for interfacing Keyboard and LCD with LPC 2148. Display the key pressed on LCD. [10]

b) State all the on chip communication protocols of LPC2148 and explain any one in detail. [8]

Q9 a) Give the μcos-II RTOS features. Draw and explain the μcos II Architecture in detail. [8]

b) Explain shared data problem and methods to solve it. [8]

OR

Q10 a) Define RTOS. Explain preemptive and non preemptive Kernel [8]

b) Define the context Switching. What are the steps involved in μcosII [8]

context switching? Why it puts additional burden on OS?

Q11 a) Explain priority inversion with proper timing diagram. Also explain PIP and PCP methods with example. [8]

b) Explain the various kernel objects for interprocess communication in μcos II [8]

OR

Q12 a) Explain the interrupt handling in μcosII and draw the state diagram show interrupt related functions. [8]

b) Explain the tasks involved in Embedded Systems application Cruise control. [8]

[Total No. of Questions: 12] **[Total No. of Printed Pages: 4]**

UNIVERSITY OF PUNE

[4364]-544

B. E. (Electronics) Examination - 2013

Advanced Measurement System (Elective) (2008 Course)

[Time: 3 Hours] **[Max. Marks: 100]**

Instructions:

1 *Answer any three questions from each section.*

2 *Answers to the two sections should be written in separate answer-books.*

3 *Neat diagrams must be drawn wherever necessary.*

4 *Black figures to the right indicate full marks.*

SECTION -I

Q.1	A	Explain different Signal Integrity issues in High frequency digital circuit design.	8
	B	Write important specifications of MSO.	2
	C	Describe use of MSO in debugging signal integrity issues.	6

OR

Q.2	A	Explain testing challenges and solutions for signal integrity issues.	8
	B	Write important specifications for Arbitrary Signal Generator.	2

	C	Draw neat schematic of Arbitrary Signal Generator and explain use of Arbitrary Signal Generator in debugging signal integrity issues.	6
Q. 3	A	Describe working of Logic Analyzer with basic clock diagram	8
	B	Explain selection of an instrument for following applications.	
	i)	Verification of digital data on parallel port for a microcontroller kit	4
	ii)	Measurement of rise time & fall time for a $\overline{RD}$ signal on microcontroller kit	4
		OR	
Q. 4	A	Explain selection of an instrument for following applications.	
	i)	To verify frequency components of the output signal of receiving antenna	2
	ii)	To measure S-parameters for microstrip resomator ckt To measure parameters of Amplitude Modulated Signals.	2
	iii)	To measure VSWR & reflection coefficient of an antenna	2
	iv)		2
	B	Write important specifications of Spectrum analyzer	2
		Explain working of Spectrum Analyzer with neat schematic.	2
Q. 5	A	Explain role of Electronic measurements for Electronic Central Unit [ECU] in an at Automotive system.	6
	B	Describe testing equipments required for testing of serial bus signals.	6

	C	Explain interfacing techniques for: i) Graphic LCD ii) Touch Screen	6
		OR	
Q. 6	A	Write short notes on i) Role of Can bus in Embedded System. ii) GSM modem and AT command iii) Role of RF modules in Embedded System	18
		SECTION II	
Q. 7	A	Explain fundamental test setup for i) Advanced Radar System ii) EMI, EMC Measurements	16
		OR	
Q. 8	A	Write short notes on i) Electromagnetic Compability ii) Microwave Power Measurement iii) Operation of barraters iv) Transmission Cavity wave Meters.	16
Q. 9	A	Explain role of software and Hardware in vertical Instrumentation.	8
	B	Name and Explain any four applications of Vertnal Instrumentation.	8
		OR	
Q. 10	A	Explain in detail Labview based Data Acquision System Design	16

Q. 11	A	Write short notes on	18
		i) Capacitance Meter	
		ii) V to F converter	
		iii) Data logger	
		OR	
Q. 12	A	Draw neat schematic of Universal Counter and explain following with respect to it.	18
		i) Frequency Measurement Mode	
		ii) Periode Measurement Mode	
		iii) Totalizing Mode	
		iv) Ratio Measurement	
		v) Measurement Errors.	

UNIVERSITY OF PUNE

[4364-545]

B.E. (Electronics) Examination-2013

Advanced Power Electronics

(2008 pattern)

Time-Three hours Maximum Marks-100

Total No. of Question=12 [Total no. of printed pages= 3]

Instructions:

(1)Answer 3 questions from Section-I. Answer 3question from Section-II,
(2)Answers to the section II should be written in separate answer books.
(3)Neat diagrams must be drawn whenever necessary.
(4)Figures to the right indicate full marks.
(5)All question carry equal marks.
(6)Assume suitable data wherever necessary.
(7)Use of logarithmic tables,slide-rule,mollier charts,,calculator and steam tables is allowed.

SECTION-I

Q.1

(a)What is the need of converter in the industry?Explain with circuit diagram & waveforms,working 3ϕ IGBT based PWM rectifier .comment on P.f.(10)

(b)Explain the need of 12 pulse converter in industrial application. (8)

OR

Q.2

(a)What are the selection criteria for converters?
Compare 3 pulse with 6 pulse converter.
Comment of P.f & Ripple Factor. (8)

(b)What is the conditioning of power diode rectifier? (6)

(c)Effect of harmonics in converter operation. (4)

Q.3

(a)What are DC droves/Explain with circuit diagram ,working of DC motor speed control technique by using microcontroller.
Comment on P.f , Tq-speed characteristics. (10)

(b)What are cycloconverters?Explain with principle ,circuit diagram & waveform

working of cycloconverter with 3 pulse. State it advantages & disadvantages.(6)

OR

Q.4

(a)What is PLL?Explain with block diagram,speed control technique of DC motor by using PLL for varying Load conditions. Comment on P.f. (8)

(b)What is flux Vector Control of Induction Motor?Explain with block diagram & features working of 3ϕ ,I.M. Justify its need in industry. (8)

Q.5

(a)What is the need of Multilevel inverters in the industry?Explain with circuit diagram ,switching of multilevel inverters. (10)

(b)What are double sided converters?Explain. (6)

OR

Q.6

(a)What is the need of modulation in the industry?Explain any one widely used modulation technique in drive application. (8)

(b)Explain the need of Selective Harmonic elimination technique in multi level inverters. (8)

SECTION-II

Q.7

(a)What is power quality?Explain different types of power line disturbance, preventive & nullifying measurement techniques.Comment on power related quality issues. (12)

(b)What are Z-Source inverters/compare with VSI & CSI. (6)

OR

Q.8

(a)What are resonant converters?Explain with circuit diagram & waveforms working of ZVS Commment on P.f. State its advantages & disadvantages.(10)

(b)What is soft switching& Explain. (3)

(c)What is the effect of series loading in series resonant converter. (5)

Q.9

(a)What are low drop out Regulators?Explain. (8)

(b)Explain the need of hot swappable redundant power supplies in industries.(8)

Q.10

(a)What are battery powered drives?Explain. (8)

(b)What are the limitations of Back to Back converters in wind power plants (WPP)?Explain. (8)

Q.11

(a)What is HVDC?Explain. (10)

(b)HVDC transmission system is rated at 500 mw +- 250 Kv & converters are connected in series. Determine the RMS Current & Peak reverse volt(PRV) of each thyrister. (6)

Q.12 Write a short note on any three. (16)

(i)Photo Voltalic energy conversion systems
(ii)Solar power conditioning.
(iii)Traction drives.
(iv)Matrix converter.
(v)FACTS [Flexible AC X^{ssion}]

UNIVERSITY OF PUNE

[4364]-546

B. E. (ELECTRONICS) Examination 2013

BIOMEDICAL INSTRUMENTATION

(2008 Course)

[Total No. of Questions:12] **[Total No. of Printed pages :3]**

[Time : 3 Hours] **[Max. Marks : 100]**

Instructions :

(1) *Solve 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.

SECTION I

Q.1a) What do you mean by cell? List different functions of cell? [8]

Draw cell structure and explain in detail

b) What do you mean by bio signal ? Explain different sensors used for different bio signal Measurement. [8]

OR

Q.2a) What do you mean by skin contact impedance & motion artifact? [8]

what are the effect of these two white measuring Bio signal?

b) Discuss most important factors to be considered in the design of medical instrumentation [8]

Q.3a) What is roll of Nervous system in living organism? Draw a neuron structure & explain it in detail. [8]

b) Explain α, β,Θ & δ activities in relation with EFG. [8]

OR

Q.4a) Explain the working of brain & function of spinal cord. [8]

b) What is the function of Electromyography? Enlist the types of EMG & Explain the procedure to perform EMG. [8]

Q.5a) Sketch bipolaz limb leads, unipolaz augmented limb leads and comment Explain the basic waveform of the normal ECG. [10]

b) What are effect of artifacts on ECG readings? Explain block diagram of typical ECG machine. [8]

OR

Q.6a) Explain cardiovascular system & elucidate about electrical signal origins it. [10]

b) Write a short note on ECG amplifier with input protection & isolation circuit. [8]

SECTION II

Q.7a) Write a short note on indirect & direct blood pressure measurement method. [8]

b) What are the properties of x-Ray machine? Explain in detail the technique for visualization of x-ray. [8]

OR

Q.8a) With block schemetic, explain finger plethesmography for peripheral pulse monitoring. [8]

b) Give salient feature of electromagnetic blood flow meter. [6]

c) Explain systole & diastole. [2]

Q.9a) Write a short note on life saving devices [8]

i) pacemaker ii) Defibrillators

b) Explain different techni que for electrical safty of medical instruments. [8]

OR

Q.10a) Draw block diagram of EEG machine. Explain in detail. [8]

b) Write advantages & disadvantages of Electronic stethoscope. [8]

Q.11a) What is CT scan ? Compare MRI & CT scan. [10]

b) What are the objective of patient monitoring system? Explain central monitoring system with block diagram. [8]

OR

Q.12a) Explain various application of LASER in medicine. Write general LASER safty guideline. [10]

b) Write short note (any two) [8]

i) Oximeter

ii) Amalgamator

iii) Blood cell counter.

[Total No. of Questions: *12*] **[Total No. of Printed Pages:** *3*]

UNIVERSITY OF PUNE
[4364]-547
B. E. (*Electronics*) Examination – May 2013
MECHATRONICS
(2008 Pattern)(Elective-I (404204)

[Time: *3* **Hours]** **[Max. Marks: 100]**

Instructions:

1. ***Answer*** *three questions from section I and three questions from section II.*
2. *Answers to the* ***two sections*** *should be written in* ***separate answer-books****.*
3. *Neat diagrams must be drawn wherever necessary.*
4. *Assume suitable data, if necessary.*
5. *Black figures to the right indicate full marks.*

SECTION -I

Q.1	A	What are the functions of Mechatronics system? Explain the key elements Of Mechatronics in detail.	[8]
	B	What are different mechanical components? Explain belts and Pulleys in detail	[8]

OR

Q.2	A	Explain the step wise design procedure of any one Mechatronics System.	[8]
	B	State different types of gears. Explain any two types of gears with their applications.	[8]
Q.3	A	What is a model? What are the fundamental components of a mechanical system?	[8]
	B	What are the common structures in Mechatronics?	[8]

Explain any two.

OR

Q. 4	A	What is electrical actuator? Explain solenoids and relays as electrical actuators.	[8]
	B	Write short note on DC motors and servo motors.	[8]
Q. 5	A	State different types of valves. Explain selection criteria for control Valve and draw 3/2 valve, 4/2 valve.	[8]
	B	Explain selection criteria, principle of operation and specifications for force measurement.	[10]

OR

Q. 6	A	Explain variable frequency drives with neat block diagram.	[10]
	B	Write a short note on pneumatic and hydraulic systems.	[8]

SECTION II

Q. 7	A	What are special requirements of Mechatronics that differentiate from classic systems and control design.	[8]
	B	Explain the conceptual design of a mobile robot.	[8]

OR

Q. 8	A	What is integrated modeling? Explain the design of a simple servo system.	[8]
	B	Explain Hill climbing algorithm, Tabu search algorithm, Simulated annealing algorithm and Genetic algorithm.	[8]
Q. 9	A	Explain use of computers and concept of real time in Mechatronics.	[8]
	B	Explain architecture of PLC with neat block diagram.	[8]

OR

Q. 10	A	Write short note on RS-232, RS-422 and RS-485 interfaces.	[8]
	B	Describe General Purpose Interface Bus standard.	[8]
Q. 11	A	Explain data logging functional requirements in detail.	[10]
	B	Explain a data logger for a milk filling plant having conveyer based filling and sealing system.	[8]

OR

Q. 12	A	Discuss working of copying machine with block diagram.	[10]
	B	Explain multichannel data logger with block diagram.	[8]

UNIVERSITY OF PUNE

[4364]-549

B. E. (Electronics) Examination - 2013

ENTREPRENEURSHIP DEVELOPMENT AND BUSINESS PLANNING
Elective-II(404205)

(2008 Course)

[Time: 3 Hours] **[Max. Marks: 100]**

[Total No. of Questions: 12] **[Total No. of Printed Pages: 4]**

Instructions:

1 *Answer any three questions from EACH SECTION*

2 *Answers to the two sections should be written in separate answer-books.*

3 *Neat diagrams must be drawn wherever necessary.*

4 *Black figures to the right indicate full marks.*

5 *Use of logarithmic tables, slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.*

6 *Assume suitable data, if necessary.*

SECTION -I

Q.1	A.	Explain the role of government in market economy?	8
	B.	Explain in detail-the concept of business plan	8

OR

Q.2	A.	Write a note on keeping and accounting.	8
	B.	Explain the demand and supply curve in a market economy. Also example the concept of equilibrium price	8

Q. 3	A.	Explain in detail the concept of financial management with respect to running a successful business.	8
	B.	Explain the value of market research. How will you perform market research?	8

OR

Q. 4	A.	Write a short note on markup price and markdown price with suitable example.	8
	B.	Write advantages and disadvantages of 1. Starting our own business 2. Owning a franchise	8
Q. 5	A.	Manish and Sumedh want to start a business of furniture. Write a partnership agreement in between them.	8
	B.	What are the ways to improve the cash flow	8

OR

Q. 6	A.	Explain how will you choose location for retail and nonretail business.	8
	B.	Is entrepreneurship right for you? Explain how you will decide it?	8

SECTION II

Q. 7	A.	Explain the basic rules of effective business letters.	8
	B.	Explain the following 1. Copyrights 2. Consumer protection Law	8

OR

Q. 8	A.	Explain the concept of primary data. Discuss the various steps of primary market research.	8
	B.	Distinguish between demand based pricing and	8

competition based pricing.

Q. 9	A.	Discuss the advantages and disadvantages of Regional shopping centers.	8
	B.	What is ethics? Why you want to establish an ethical workplace?	8

OR

Q. 10	A.	Explain the concept of opportunity cost with the help of suitable example. Why bank reject the applications of loans?	8
	B.	Explain in brief, the forms of business planning.	8
Q. 11	A.	Explain the concept of lease. Discuss the various kinds of commercial lease.	8
	B.	What is target market? How do you identify your target market?	8

OR

Q. 12	A.	What are the benefits and risks involved when competing globally?	8
	B.	Define advertising. State the advantages and disadvantages of radio advertising and newspaper advertising.	8

[Total No. of Questions: *12*] **[Total No. of Printed Pages: 2]**

UNIVERSITY OF PUNE
[4364]-550
B. E. (Electronics) Examination - 2013
System on chip(2008 Course)
[Time: *3* Hours] **[Max. Marks: 100]**

Instructions:

1 *Answer 3 questions from Section I and 3 questions from Section II.*

2 *Neat diagrams must be drawn wherever necessary.*

3 *Assume suitable data, if necessary.*

SECTION –I

Q.1	A	Classify the types of Pressure sensors.Explain any one pressure sensor in details.	8
	B	Explain basic working principle of accelerometer?	8
		OR	
Q.2	A	Explain in detail necessary ingredients that will be involved in Microsystems Design.	8
	B	Define transducer. How can we categories the transduction principles.	8
Q. 3	A	Write a short note on "Polymer for MEMS and Microsystems."	8
	B	Compare GaAs and silicon with respect to micromachining characteristics.	8
		OR	
Q. 4	A	Explain the concept of i)Mobility ii)Resistivity in context to Piezo crystal.	8
	B	Explain working principle ,advantage and disadvantage of Piezo resistive Micro accelerometers?	8
Q. 5	A	What is thermo resistor?Explain any one in detail.	9
	B	Explain in general optical and silicon properties.	9
		OR	
Q. 6	A	Explain magnetic transducer in detail.	9
	B	Explain working principle of chemical sensors.	9

SECTION II

Q. 7	A	Explain in detail the Built in self test.	8
	B	Explain SoC architecture in detail.What are advantages of SoC design Over VLSI design?	8
		OR	
Q. 8	A	Explain in detail Microsystems technology and applications.	8
	B	Explain in detail new ways for speeding up execution of instructions.	8
Q. 9	A	Explain the synthesis abstraction levels in details.	8
	B	Which different strategies are used in power supply distribution and Body-tie placement?	8
		OR	
Q. 10	A	What are the Pros and Cons of behavioral synthesis?	8
	B	Explain working of CVD?Which new CVD process is used to overcome Drawbacks of CVD process?	8
Q. 11	A	Explain the concept of Hardware software co-design in detail.	9
	B	What are the issues in testing of core based systems on chip?	9
		OR	
Q. 12	A	Explain in detail of Micro system Packaging.	9
	B	Explain the terms. (i)Defects and fault method (ii)Fault simulation.	9

[Total No. of Questions: *12*] **[Total No. of Printed Pages:2]**

UNIVERSITY OF PUNE

[4364]-552

B. E. (*Electronics Engineering*) Examination - 2013

(Computer Network & Security(404207))(2008 Course)

[Time: *3* Hours] **[Max. Marks: 100]**

Instructions:

1. *Answer 3 questions from Section-I and 3 questions from Section-II*
2. *Answers to the two sections should be written in separate answer-books.*
3. *Neat diagrams must be drawn wherever necessary.*
4. *Figures to the right indicate full marks.*
5. *Use of logarithmic tables, slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.*
6. *Assume suitable data, if necessary.*

SECTION -I

Q.1	A	Explain TCP/IP layers and their functions.	8
	B	Differentiate between peer to peer network & client server network	4
	C	Explain the term network architecture with suitable example.	4
		OR	
Q.2	A	Explain different service premitives. Compare connection oriented services & connectionless services.	8
	B	Discuss various principles that are applied to arrive at seven layers of OSI-ISO model. Give reasons for the failure of this model.	8
Q3	A	Explain HTML programming & related TAGS in brief	6
	B	How electronic mail systems work? Explain basic functions in electronic mail.	6
	C	What is URL? Explain its component	4
		OR	
Q. 4	A	Write short note on: 1. FTP 2. TELNET 3. SMTP 4. DNS	16
Q5	A	Write short note on i). DHCP ii). ICMP	6
	B	Explain distance vector routing.	6
	C	What is congestion? Explain any one congestion control technique.	6
		OR	
Q. 6	A	Explain the function of network layers. What services are provided by network layer to transport layer.	6

	B	Draw TCP header. Explain function of each field.	6
	C	Compare IPv4 vs IPv6	6

SECTION II

Q. 7	A	Explain why CSMA/CD cannot be used in wireless LAN	4
	B	Differentiate between bridge & repeater	4
	C	Discuss in brief three methods used to enhance the performance of traditional Ethernet.	8

OR

Q. 8	A	Discuss any two Multiple access techniques.	8
	B	List the different framing methods and explain any one of them in detail.	8
Q. 9	A	What is cable modem? Explain.	6
	B	Compare & contrast a circuit switched and packet switched network.	8
	C	What is DSL? Explain.	4

OR

Q. 10	A	Explain Guided & Unguided Transmission media in detail.	9
	B	Compare various communication satellites.	9
Q. 11	A	What are the pros and cons of providing security?	4
	B	Explain in brief a model for network security.	8
	C	Explain DES algorithm	4

OR

Q. 12	A	What is public key cryptography? Explain RSA algorithm in detail.	8
	B	What is meant by encryption? Describe the private key cryptography.	4
	C	Compare Public key and Private key cryptography.	4

[Total No. of Questions: 12] **[Total No. of Printed Pages:2]**

UNIVERSITY OF PUNE
[4364]-554
B. E. (Electronics Engineering) Examination - 2013
AUDIO AND VIDEO ENGINERRING
(ELECTIVE - III) (2008 Course)

[Time: 3 Hours] **[Max. Marks: 100]**

Instructions:

1 *Answers to the two sections should be written in separate answer-books.*
2 *Black figures to the right indicate full marks.*
3 *Your answer will be valued as a whole*
4 *Neat diagrams must be drawn wherever necessary.*
5 *Use of logarithmic tables, slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.*
6 *Assume suitable data, if necessary.*

SECTION -I

Q.1	A)	Explain why FM is used for sound & AM used for picture in an television system.	[6]
	B)	What is a colour burst signal? why and where is it added.	[4]
	C)	What do you understand by persistence of vision and flicker? How flicker is reduced in television.	[6]
		OR	
Q.2	A)	Draw and explain the vertical details of Composite video signal	[6]
	B)	Explain the terms with suitable sketches. i) Chromaticity diagram. ii) Frequency Interleaving.	[6]
	C)	Explain the concept of weighted factors and over modulation	[4]
Q. 3	A)	Explain how television pattern generator and wobbuloscope are helpful in TV alignment and fault finding.	[8]
	B)	Compare PAL, NTSC and SECAM TV System	[6]
	C)	Explain why (G-Y) is not transmitted in an colour TV transmission.	[4]
		OR	
Q. 4	A)	Draw the block diagram of colour TV receiver and explain its operation	[10]
	B)	Explain the NTSC Encoder & Decoder	[8]

Q. 5	A)	What is MAC encoding? Explain the general format of MAC signal? State the different types of MAC signals	[8]
	B)	With the help of block diagram explain MPEG-2 encoder and Decoder.	[8]
		OR	
Q. 6	A)	Compare Analog and Digital TV	[4]
	B)	Draw the neat block diagram of Digital TV receiver and explain.	[8]
	c)	Compare performance of Interlace and Progressive scanning used in Digital TV	[4]

SECTION II

Q. 7	A	Write a note on i) Video on Demand ii) 3D TV System	[10]
	B)	Explain the direct- to- Home technique for television broadcasting using neat block diagram.	[8]
		OR	
Q. 8	A)	Using schematic diagram of equipment set-up explain the coverage plan for a Marathon Match.	[10]
	B	Explain the following i) HDTV standard and parameters. ii) CCTV	[8]
Q. 9	A)	With the help of a block diagram, Explain Blue-Ray DVD player	[8]
	B)	Enlist and explain the Audio Compression ITU-T Standards	[8]
		OR	
Q. 10	A)	Explain why performance of DVD is superior to other mediums.	[8]
	B)	Drew and explain the block diagram of MP3 player.	[8]
Q. 11	A)	Explain the need of Reverberation Mention reverberation periods and factors on which reverberation time depends.	[8]
	B)	Explain the Satellite Radio receiver with the help of block diagram. Also State its applications.	[8]
		OR	
Q. 12	A)	Write a note on i) Graphic Equalizers and Digital filters ii) Chrodless Microphone system.	[8]
	B)	What are the requirements of a good auditorium for pleasant listening? Give the features of acoustical design of an Auditorium	[8]

[Total No. of Questions: 12] **[Total No. of Printed Pages: 2]**

UNIVERSITY OF PUNE
[4364]-555
B.E. (Electronics)
Examination-2013
IMAGE PROCESSING AND MACHINE VISION
(2008 Course)

[Time: 3 Hours] **[Max. Marks: 100]**

Instructions:

1 Answer three questions from Section I and 3 questions from Section II.
2 Neat diagrams must be drawn wherever necessary.
3 Black figures to the right indicate full marks.
4 Assume suitable data, if necessary.

SECTION I

Q1. (a) Discuss Image formation model. Define illumination and reflectance. (8)
(b) Explain one technique for Image Acquisition in detail (10)

OR

Q2. (a) With the help of a block diagram explain the different steps in image digitization. How is digital image represented? (10)
(b) Explain the phenomena of brightness adaptation and simultaneous contrast. (8)

Q 3. (a) Discuss in brief the various Piecewise linear Transformation Techniques. (8)
(b) Give the matrix of average filter. What are its advantages and disadvantages? (8)

OR

Q 4. (a) Filter the given image F(m,n) using 3x3 averaging using zero padding. (8)

$$F(m,n) = \begin{vmatrix} 1 & 2 & 3 & 2 \\ 4 & 2 & 5 & 1 \\ 1 & 2 & 6 & 3 \\ 2 & 6 & 4 & 7 \end{vmatrix}$$

(b) What is histogram matching? Give its application and advantages. (8)

Q 5. (a) How are discontinuities detected in an image? Explain point detection and (8)

		Line detection.	
	(b)	What is Thresholding? What is the role of illumination in thresholding?	(8)
		OR	
Q 6.	(a)	What is skeletonization? Explain how it can be used for image representation.	(8)
	(b)	Discuss how Hough transform is useful in line detection.	(8)
		SECTION II	
Q 7.	(a)	With the help of neat block diagram explain Lossless Predictive Coding.	(8)
	(b)	Explain the Image Pyramid used for Multiresolution image Analysis	(10)
		OR	
Q8.	(a)	Explain one method of image restoration.	(10)
	(b)	With the help of block diagram explain two-band subband coding and decoding system.	(8)
Q9.	(a)	With the help examples describe shape number for shapes of order 4,6 and 8.	(8)
	(b)	What is Texture? Explain how it can be described with Statistical parameters.	(8)
		OR	
Q10.	(a)	How does Fourier Descriptor help in detecting boundaries? Explain with examples.	(8)
	(b)	Give the set of moments invariant to translation, rotation and scale change.	(8)
Q11.	(a)	Compare Statistical and Syntactical approach for object recognition.	(8)
	(b)	Give the basic terminology used in graph theory. Explain the use of graph theory for object recognition.	(8)
		OR	
Q12.	(a)	Explain support vector approach for pattern recognition.	(8)
	(b)	Explain the terms world co-ordinates, camera co-ordinates and image co-ordinates with respect to single perspective camera.	(8)

[Total No. of Questions: 12] **[Total No. of Printed Pages: 3]**

UNIVERSITY OF PUNE

[4364]-556
B. E. (Electronics) Examination – 2013
Optical and Microwave Communication
(Elective – III) (2008 Course)

[Time: *3* Hours] **[Max. Marks: 100]**

Instructions:

1 ***Answer Q1 or Q2, Q3 or Q4, Q5 or Q6 from Section I and Q7 or Q8, Q9 or Q10, Q11 or Q12 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 *Assume suitable data, if necessary.*

SECTION -I

Q.1 A Define and explain the following terms in context of an optical fiber: 06

1. Numerical Aperture
2. Critical angel and
3. Total internal reflection.

B A step index multimode fiber with numerical aperture of 0.2 supports approximately 100 modes at 850nm wavelength. 06

1. Calculate the diameter of the core.
2. How many mode does the fiber support at 1310nm?
3. What percent of optical power flows in the cladding at 1310nm?

C Compare the performance of laser diode versus light emitting diode versus light emitting diode in fiber optic communication. 06

OR

Q.2	A	Explain the terms dispersion-shifted and dispersion-flattened in case of optical fibers. How does one achieve the same? What is the need of such fibers in communication links?	06
	B	State and explain the desirable properties of a source for optical fiber communication links?	06
	C	Explain the following characteristics of photo detectors: a. Quantum efficiency b. Response time	06
Q. 3	A	A laboratory demonstration setup has a continuous 12km long optical fiber link that has a loss of 1.5dB/km. a. Compute the minimum optical power level that must be launched into fiber to maintain an optical power level of 0.3μW at the receiving end. b. Calculate the required input power if the fiber has a loss of 2.5dB/km	08
	B	Draw a neat diagram of a WDM system and explain the desirable characteristics of each of the passive components in the optical path.	08
		OR	
Q. 4	A	Calculate and compare the rms pulse broadening per kilometer for the following fibers: a. A MMSI fiber with core refractive index 1.49 and relative index difference of 1%. b. A graded index fiber having an optimum parabolic index profile and axial core refractive index of 1.49 and Δ=1%	08
	B	Explain the mechanism of amplification in an EDFA with a suitable energy level diagram. State the performance parameters of EDFA.	08
Q. 5	A	Explain with the help of a neat diagram the setup for liquid level measurement using optical sensors. What parameters would enhance the measurement accuracy of your system?	08
	B	State and explain the requirements from lasers to be used in medical field.	08

OR

Q. 6	A	Write short notes on: a. Measurement of pressure and temperature using optical sensors. b. Medical applications of Lasers.	16
		SECTION II	
Q. 7	A	State and explain the properties of scattering matrix in context of microwave components.	06
	B	Write the s-matrix and explain the significance of the same for H plane and E plane Tee sections.	06
	C	State and explain the applications of hybrid junction.	06
		OR	
Q. 8	A	Draw and explain the working of following microwave components: a. Directional coupler b. Gyrator c. Attenuator and matched terminations	18
Q. 9	A	Draw the structure of a travelling wave tube and explain its working.	08
	B	Explain the principle of mechanism involved in Magnetrons. State applications of Magnetrons.	08
		OR	
Q. 10	A	Draw and explain the principle of a reflex klystron. Explain the concepts of modes in such microwave sources	08
	B	With reference to Klystrons explain the terms: a. Power output b. Efficiency	08
Q. 11	A	Explain the principle of operation of Gunn diode and explain the various modes of its operation.	08
	B	Explain with neat diagram the principle of microwave transistors.	08
		OR	
Q. 12	A	Draw and explain the mechanism of operation of following microwave solid-state devices: a. Schottky diode b. Tunnel diode Also state their application areas	16

[Total No. of Questions: 12] **[Total No. of Printed Pages: 2]**

UNIVERSITY OF PUNE
[4364]-558
B. E. (Electronics) Examination - 2013
ADVANCED COMMUNICATION SYSTEM
(2008 Pattern)(Elective IV

[Time: 3 Hours] **[Max. Marks: 100]**

Instructions:

1 *Answers to the two sections should be written in separate answer-books.*
2 *Black figures to the right indicate full marks.*
3 *Neat diagrams must be drawn wherever necessary.*
4 *Use of logarithmic tables, slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.*
5 *Assume suitable data, if necessary.*
6 *Answer any three questions from Section I and any three questions from Section II*

SECTION -I

Q.1	A	With the help of neat block diagram explain the operation of mobile system.	6
	B	Describe the following w.r.t. mobile environment. i. Propagation ii. Multipath fading	6
	C	Explain various mechanisms to enhance spectral efficiency.	6
		OR	
Q.2	A	With suitable example, explain various propagation paths in cellular mobile system.	6
	B	Describe the operation of cellular system in detail.	6
	C	Why to use 1-mi. intercept?	6
Q. 3	A	Classify the antennas based on the various situations occurred in mobile wave propagation.	8
	B	Explain near end and far end interference.	8
		OR	
Q. 4	A	What is the difference between frequency management and channel assignment? Explain in detail frequency management.	8
	B	Describe delaying a handoff with the help of suitable algorithm.	8
Q. 5	A	Which are the approaches used at the cell site to increase the coverage?	8
	B	Explain how dynamic splitting is superior than permanent splitting.	8
		OR	
Q. 6	A	Describe the advantages of digital cellular system.	8
	B	How cell sites are installed to cover the highway traffic?	8

SECTION II

Q. 7	A	What are Kepler's three laws of planetary motion? Give the mathematical formulation of Kepler's third law.	6
	B	The earth rotates once per sidereal day of 23h56min4.09s. show that the radius of the GEO is 42164.17 km.	5
	C	What do the terms perigee and apogee mean when used to describe the orbit of a satellite orbiting the earth?	5
		OR	
Q. 8	A	With the help of suitable block diagram, explain single conversion transponder for 6/4 GH_Z band.	6
	B	Describe various types of antenna used on satellite.	5
	C	Explain communication subsystem used in satellite.	5
Q. 9	A	A Ku band satellite uplink has a carrier frequency of 14.125 MH_Z and carries a symbol stream at Rs= 16Msps. The transmitter and receiver have RRC filters with a α=0.25. what is the frequency range of the transmitted RF signal?	8
	B	Describe QPSK modulator and demodulator for satellite communication.	8
		OR	
Q. 10	A	What are the various considerations and assumptions while designing the uplink and downlink budget?	8
	B	Geostationary satellites use L, C, Ku and Ka bands. The path length from an earth station to the GEO satellite is 38,500 km. For this range calculate the path loss in decibels for the following frequencies. i. 1.6 GH_Z, 1.5 GH_Z ii. 6.2 GH_Z, 4.0GH_Z iii. 14.2 GH_Z,12.0GH_Z iv. 30.0GH_Z, 20.0GH_Z	8
Q. 11		Write short notes on following (any three) i. FDMA ii. Inter-modulation iii. TDMA frame structure iv. Network architectures in VSAT system	18
		OR	
Q. 12	A	Describe schematic of the typical configuration of VSAT earth station.	6
	B	Assume that the TDMA system uses a 125μs frame time. Find the number of channels that each earth station can send within the TDMA frame when: 1. No time is lost in overheads, preambles 2. A 5 μs preambles is added to the beginning of each earth station's transmission 3. A 5 μs preamble is added to each station's transmission and 2 μs guard band is allowed between every transmission	6
	C	Explain Guard times and synchronization in TDMA networks.	6

[Total No. of Questions: 12] **[Total No. of Printed Pages: 2]**

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B. E. (Electronics) (Elective – IV) Examination - 2013

AUTOMOTIVE ELECTRONIC SYSTEMS (SEM-II) (2008 Course)

[Time: 3 Hours] **[Max. Marks: 100]**

Instructions:

1 *Answer any three questions from Section I and any three questions from Section II*
2 *Attempt not more than six questions of which at least three questions must be from each section*
3 *Answers to the two sections should be written in separate answer-books.*
4 *Neat diagrams must be drawn wherever necessary.*
5 *Black figures to the right indicate full marks.*
6 *Use of electronic pocket calculator is allowed.*
7 *Assume suitable data, if necessary.*

SECTION -I

Q.1 A What is the significance of each of the following actions related to two stroke engine? 8
- i) Intake
- ii) Compression
- iii) Power
- iv) Exhaust

B List the automotive system components and explain each component in brief 6

C List at least two important specifications of battery and explain their significance in brief. 4

OR

Q.2 A Compare Petrol engine with Diesel Engine with proper examples 8

B What is the role of Ignition system of IC Engine? 6

C What is 'Emission Control' 4

Q. 3 A What are the various modes of operation of Hybrid Electric Vehicle(HEV)? 8

B With the help of working Principle, characteristic, limitations and use of following sensors in context with automotive system 8
- i) Temperature sensor
- ii) Vibration sensor

OR

Q. 4 A Justify the selection of sensors for following applications: 8
- i) Anti-collision system
- ii) Vehicle tyres

B With the help of working principle, characteristics, limitations and use of any two types of Actuators, in context with automotive system 8

Q. 5	A	How steering control system works? Explain with proper diagram	8
	B	With appropriate examples differentiate analog and digital control methods in context with automotive system.	8
		OR	
Q. 6	A	What are different strategies of 'Engine Management System' used in automotive systems?	8
	B	Write short notes on: i) Wipers control ii) Remote keyless entry	8

SECTION II

Q. 7	A	What are the selection criterias for processors of Automotive System	8
	B	State and explain hardware and software debugging techniques in context with automotive application	8
		OR	
Q. 8	A	With the help of Interfacing diagram and its 'C' program , explain RPM Indication using Timer/Counter of PIC	8
	B	Compare 'soft real time' with 'hard real time' in context with automotive system	8
Q. 9	A	With the help of proper example justify the relevance of Internet Protocols in automotive applications	8
	B	What are the recent trends in Automotive System Buses such as OBD II and MOST	8
		OR	
Q. 10	A	Compare CAN, LIN and Flex Ray buses	8
	B	Compare architectural features of ARM 9 and ARM cortex in automotive applications	8
Q. 11	A	What are various safety norms and statements used in automotive system?	8
	B	Write short notes on: i) Basic wiring system ii) Multiplex wiring system	8
		OR	
Q. 12	A	Enlist various occupant safety features available in Modern Automotive Systems.	8
	B	Compare 'On-board' and 'off-board' diagnostics in automotive application	8

[Total No. of Questions: 12] **[Total No. of Printed Pages:** 3]

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B. E. (*Electronics*) Examination - 2013

ARTIFICIAL INTELLIGENCE(2008 Course)

(404210)

[Time: *3* **Hours]** **[Max. Marks: 100]**

Instructions:

1 *Answer 3 questions from 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 logarithmic tables, slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.*

6 *Assume suitable data, if necessary.*

SECTION -I

Q.1	A	Give PEAS descriptors for the following: 1.Medical Diagnosis System 2.Interactive English Tutor	12
	B	Explain "Simple Reflex based agent" with the help of diagram or pseudo code.	6
		OR	
Q.2	A	State uniformed search algorithms. Explain any one in detail.	8
	B	Explain steepest ancient hill climbing and stimulated annealing in detail.	10
Q. 3	A	Explain Minimax search procedure with alpha beta giving proper example.	8
	B	Solve the following crypt arithmetic problem by using constraint satisfaction method.	8

BASE + BALL = GAMES

OR

Q. 4	A	Write pseudo code for A * algorithm.	8
	B	Compare BFS & DFS search methods.	8
Q. 5	A	Explain the working of Unification algorithm with suitable example.	8
	B	Explain following first order logic symbols with suitable example. $\forall, \exists, \Rightarrow, \wedge, \vee, \Leftrightarrow, \neg, =$	8

OR

Q. 6	A	Represent the following sentences by First order logic calculus. i) Some dogs bark ii) All dogs have four legs iii) All barking dogs are irritating iv) No dogs purr.	8
	B	State the rules and steps for converting a given well predicate logic statements to clausal from.	8

SECTION II

Q. 7	A	Explain in detail the single layer feed forward artificial neural network architecture.	8
	B	Explain any two earning methods.	10

OR

Q. 8	A	Explain the role of Neural Network in learning. In relation to multiplayer network mention the weight update equation.	10
	B	Generate an expert system for a two wheeler service.	8
Q. 9	A	Draw the valid fork labeling , L labeling , T labeling and arrow labeling to label 3 – D figures using Waltz's algorithm.	8
	B	Explain Waltz algorithm with example and comment on its limitations.	8

OR

Q. 10	A	Draw a neat diagram of an expert system and explain the functioning of the major components.	8
	B	Explain Perception confined to Vision and speech recognition.	8
Q. 11	A	With suitable example explain ambiguity and method of	8

		disambiguation.	
	B	Parse each of the sentences using top-down and bottom-up approach. i) Mary watered the plants ii) The brown dog ate the bone.	8
		OR	
Q. 12	A	Explain pragmatic parsing.	8
	B	Explain Probabilistic language models.	8

[Total No. of Questions: *12*] **[Total No. of Printed Pages:** *2*]

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B. E. (*Electronics***) Examination - 2013**

Nanotechnology in Electronics(2008 Course)

[Time: *3* **Hours]** **[Max. Marks: 100]**

Instructions:

1 ***Answer any three questions from each Section.***

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.*

SECTION -I

Q.1	A	Explain in detail the fundamental science behind Nanotechnology.	08
	B	List the different tools for measuring Nanostructures and explain spectroscopy in detail.	08
		OR	
Q.2	A	Explain the following tools to make Nanostructures. 1. Nanosacle Lithography 2. Dip pen Nanolithography	08
	B	What are the different challenges for tools to imagine nanobehavior?	08
Q. 3	A	Explain the floating gate non volatile and silicon nanocrystal non volatile memory.	08
	B	Write short note on Novel dielectric material for future transistor.	08
		OR	
Q. 4	A	Draw and explain the process flow for integrating a nanocrystal memory with standard CMOS technology.	08
	B	Differentiate between NAND and NOR memory.	08
Q. 5	A	Write short note on 1. Magic number 2. Semiconducting Nanoparticles	10
	B	List the properties and uses of Nanotubes.	08
		OR	

Q. 6	A	Explain the nature of carbon bond and write short note on the concept of Hybridization .	10
	B	Explain the following applications of carbon nanotube in detail. 1. Computers 2. Fuel cells	08

SECTION II

Q. 7	A	Explain fabrication techniques used for MEMSs.	08
	B	How Scanning Tunneling Microscopy can be used to build NEMSs.	08
		OR	
Q. 8	A	Write short on molecular and super molecular switches.	08
	B	Differentiate between NEMS and MEMS.	08
Q. 9	A	What are the different limiting performance of CMOS technology.	08
	B	Explain the nanoelectronics for advance computation.	08
		OR	
Q. 10	A	Explain the tools of manufacturing of micro and nano fabrication optical lithography.	08
	B	What is nanoelectronics? Explain the challenges initiated by nanoelectronics	08
Q. 11	A	Explain various application of sensors in nanotechnology.	8
	B	Explain biomedical application in detail (any two).	10
		OR	
Q. 12	A	List out application of Nanotechnology in optics and explain it in detail.	8
	B	Write short notes on (any two) 1. Memories 2. Transformation and Storage 3. Soft molecule electronics.	10

[Total No. of Questions: *12*] **[Total No. of Printed Pages: 3]**

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B. E. (*Computer & Electronics***)/ Examination - 2013**

Information Security(2008 Course)

[Time: *3* **Hours]** **[Max. Marks: 100]**

Instructions:

1 ***Answer any 3 questions from each Section.***

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 *Assume suitable data, if necessary.*

SECTION -I

Q.1	A	List and explain OSI security services.	8
	B	Explain the following OSI security mechanisms: (i)Digital signature (ii)Access control (iii)Data Integrity (iv)Authentication exchange	10
		OR	
Q.2	A	Explain the significance of information security from legal,ethical and professional point of view in an organization.	8
	B	Differentiate between a block cipher and a stream cipher.What are two general approaches to attack a cipher?	10
Q. 3	A	Explain differential and linear cryptanalysis with suitable examples.	8
	B	Explain block cipher modes of operation.	8
		OR	
Q. 4	A	Explain 3-DES algorithm with example.	8
	B	Explain AES algorithm with example.	8

Q. 5	A	What are the three broad categories of applications of public key cryptosystems?	8
	B	Explain RSA algorithm and its application.	8
		OR	
Q. 6	A	List four general categories of schemes for the distribution of public keys?	8
	B	Explain Diffie-Hellman key exchange.	8
		SECTION II	
Q. 7	A	What is message authentication code?	8
	B	What types of attacks are addressed by the message authentication?What is the difference between a message authentication code and a one way hash function?	8
		OR	
Q. 8	A	Explain MD5 algorithm with suitable example.	8
	B	What are the properties of digital siganatures?What requirements should a digital signature satisfy?	8
Q. 9	A	Describe the Transport and Tunnel modes of IPSec.	8
	B	Describe the difference types of Intrusion detection system.	8
		OR	
Q. 10	A	What are differences in SSL and TLS? Explain in detail?	8
	B	What services are provided by IPSec? Explain the ESP header format used in IPSec?	8
Q. 11		Write a short note on any three. (i)PEM & PGP (ii)S/MIME (iii)Radix 64 (iv)Electronic commerce security	18
		OR	
Q. 12	A	Write a short note on secure electronic transaction with a neat diagram show secure electronic commerce components.	8
	B	What is Radix 64 (R64) conversion? Explain with suitable example.	10