

**FACULTY OF ENGINEERING****B.E. 4/4 (Civil) I – Semester (Main & Backlog) Examination, December 2017****Subject: Concrete Technology****Time: 3 Hours****Max.Marks: 75****Note: Answer all questions from Part A and any five questions from Part B.****PART – A (25 Marks)**

- |   |   |
|---|---|
| 1 Define quality and workability of concrete.                   | 2 |
| 2 Draw the stress strain curve for concrete and explain.        | 3 |
| 3 Differentiate between the nominal mix and design mix.         | 3 |
| 4 What is target strength? Explain.                             | 2 |
| 5 Give any three advantages of mineral and chemical admixtures. | 3 |
| 6 What is maturity concept?                                     | 3 |
| 7 What do you understand from high strength concrete?           | 3 |
| 8 What are the difficulties in high strength concrete?          | 2 |
| 9 What is recycled aggregate concrete?                          | 2 |
| 10 Explain self compacting concrete.                            | 2 |

**PART – B (5x10 = 50 Marks)**

- |   |    |
|---|----|
| 11 a) Explain the factors effecting the workability of the concrete.  | 5  |
| b) State the methods of grading of aggregates (CA & FA) and state its influence on properties of concrete.    | 5  |
| 12 a) Explain control mix concrete.   | 4  |
| b) Design a mix for M30 grade concrete assuming all the physical properties of the concrete making materials. | 6  |
| 13 a) Differentiate between mineral and chemical admixtures and explain with suitable examples.               | 5  |
| b) Discuss the advantages of plasticizers and super plasticizers.   | 5  |
| 14 Discuss in detail the applications of fly ash concrete and ready mixed concrete.                           | 10 |
| 15 Explain the applications of high strength concrete and high density concrete.                              | 10 |
| 16 a) Explain the advantages of fiber reinforced concrete.  | 5  |
| b) Briefly explain the applications of ferro cement concrete.   | 5  |
| 17 Discuss in detail the design principles and applications of self compacting concrete.                      | 10 |

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**FACULTY OF ENGINEERING**

B.E. 4/4 (EEE) I-Semester (Main &amp; Backlog) Examination, December 2017

Subject: Electrical Machine Design

Time: 3 Hours

Max. Marks: 75

*Note: Answer all questions from Part-A & any FIVE questions from Part-B***PART – A (25 MARKS)**

1. Give the classification of insulating materials. [2]
2. Compare soft and hard magnetic material. [3]
3. What is magnetic leakage and leakage co-efficient. [3]
4. Define thermal resistance. [2]
5. List the factors that influence the separation of D and L of a dc machine. [3]
6. Define specific magnetic loading. [2]
7. What are the salient features of a distribution transformer. [2]
8. What do you mean by stacking factor? What is its usual value. [3]
9. Draw the flow chart for analysis method for CAD. [3]
10. Mention the advantages of digital computer for CAD of electrical machines. [2]

**PART-B (50 MARKS)**

11. Explain the following materials in brief.
  - a) Sheet steel
  - b) Alloys of copper
  - c) Solid core material. [10]
12. A 175 MVA, 20 pole water wheel generator has core of length 1.72 m and a diameter of 6.5 m. the stator (open) have a width of 22 mm, the slot being 64 mm and air gap length at the centre of pole is 30 mm. there are 41 radial ventilating ducts each 6 mm wide. The total mmf per pole is 27000 A. the mmf required for the air gap is 87% of the total mmf per pole. Estimate the average flux density in the air gap if the field factor is 0.7. [10]
13. a. List the various types of enclosures for rotating machines and explain in brief. [5]  
 b. Derive the expressions for calculating of quantity of cooling medium. [5]
14. Explain the tentative design of field system, derive all necessary equations and mention the assumptions made wheel design. [10]
15. a. Derive the output equation of 3- phase transformer. [5]  
 b. Estimate the main dimensions including winding conductor area of a 3 phase delta – star core type transformer rated at 300 KVA, 6600/400V, 50Hz. A suitable core with 3 steps having a circumscribing circle of 0.25m diameter and leg spacing of 0.4m is available.  $EMF / \text{turn} = 8.5 \text{ V}$ ,  $\delta = 2.5 \text{ A/mm}^2$ ,  $k_w = 0.28$  and  $s_f = 0.9$  (stacking factor). [5]
16. a. Derive the output equation of an 3- phase induction motor. [5]  
 b. What are the advantages and disadvantages of designing the alterations with higher flux density? [5]
17. Explain the different approaches of computer aided design electrical machines with help of neat flow charts. [10]

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**FACULTY OF ENGINEERING****B.E. 4/4 (ECE) I – Semester (old) Examination, December 2017****Subject: Mobile Cellular Communication****Time: 3 Hours****Max.Marks: 75****Note: Answer all questions from Part A and any five questions from Part B.****PART – A (25 Marks)**

- |    |   |   |
|----|---|---|
| 1  | Define frequency re-use. How to determine a co-channel cell.  | 3 |
| 2  | What is cross talk? How to minimize it?   | 3 |
| 3  | Differentiate between FDD and TDD.  | 2 |
| 4  | Compare pure ALOHA and slotted ALOHA.   | 2 |
| 5  | What is IS-95? Discuss.   | 3 |
| 6  | Write the services of GSM.  | 2 |
| 7  | Find the far-field distance for an antenna with maximum dimension of 1m and operating frequency of 900 MHz. | 2 |
| 8  | Define fading.  | 2 |
| 9  | Write a short note on personal area networks.   | 3 |
| 10 | Compare 1G, 2G and 2.5G.  | 3 |

**PART – B (5x10 = 50 Marks)**

- |    |  |   |
|----|--|---|
| 11 | a) Briefly explain operation of a basic cellular system.   | 5 |
|    | b) What are the factors influencing the hand-offs? Explain.  | 5 |
| 12 | a) Explain partition losses (same floor) for indoor propagation model.   | 5 |
|    | b) Briefly discuss types of small-scale fading.  | 5 |
| 13 | a) Explain TDMA frame structure and derive an expression for efficiency of TDMA.   | 7 |
|    | b) If a normal GSM time slot consists of 6 trailing bits 8.25 guard bits, 26 training bits, and 2 bursts of 58 bits of data find the frame efficiency. | 3 |
| 14 | a) Draw the GSM architecture with various interfaces and explain.  | 5 |
|    | b) Differentiate between GSM forward and reverse channels.   | 5 |
| 15 | a) Briefly explain 3G W-CDMA.  | 5 |
|    | b) How a cellular telephone call is made? Discuss.   | 5 |
| 16 | a) Discuss practical link budget design using path loss models.  | 5 |
|    | b) Explain cell splitting and cell sectoring.  | 5 |
| 17 | Write a short note on the following:   |   |
|    | a) Trunked radio system.   | 5 |
|    | b) CSMA  | 5 |

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**FACULTY OF ENGINEERING**

B.E. 4/4 (M/P/AE) I - Semester (Main &amp; Backlog) Examination, December 2017

Subject: Operations Research

Time: 3 Hours

Max. Marks: 75

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

- 1 What are the areas of application of OR?
- 2 Define and illustrate graphically the following terms:  
(i) Optimal Solution (ii) Feasible Solution (iii) Unbounded solution
- 3 What is duality? What is the significance of dual variables in an LP model?
- 4 State the conditions to be satisfied in order to apply the dual simplex method.
- 5 How do you confirm that a Assignment problem has multiple optimal solution?
- 6 What are situations in which replacement of items becomes necessary?
- 7 What is meant by saddle point in game theory?
- 8 How do you resolve a degeneracy in Transportation problem?
- 9 State the Johnson-Bellman principle.
- 10 Define (i) Reneging (ii) Balking (iii) Jockeying

**PART – B (50 Marks)**

- 11 Use Simplex method to solve the following LPP

$$\text{Minimize } Z = 2x_1 + 3x_2 + x_3$$

$$\text{Subject to } x_1 - 2x_2 + 3x_3 \geq -4$$

$$2x_1 + 5x_2 - 7x_3 \leq 8$$

$$x_1, x_2, x_3 \geq 0$$

- 12 Use Big-M method to solve the following LPP.

$$\text{Maximize } Z = 3x_1 - x_2$$

$$\text{Subject to } 2x_1 + x_2 \geq 2$$

$$x_1 + 3x_2 \leq 3$$

$$x_2 \leq 4$$

$$x_1, x_2 \geq 0$$

- 13 For the following travelling salesman problem find the best route to come back to the starting point so as to minimize the distance travelled.

		To				
		A	B	C	D	E
From	A	$\infty$	4	10	14	2
	B	12	$\infty$	6	16	14
	C	16	14	$\infty$	8	14
	D	24	8	12	$\infty$	10
	E	2	6	4	16	$\infty$

..2..

14 Evaluate the optimum solution for the following TP.

		Warehouses					Supply
		D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	D <sub>5</sub>	
Origin	O <sub>1</sub>	4	2	3	2	6	8
	O <sub>2</sub>	5	4	5	2	1	12
	O <sub>3</sub>	6	5	4	7	3	14
	Demand	4	4	6	8	8	

15 Determine the optimal replacement policy, based on the following data, where initial cost of the machine is Rs. 8,00,000.

Year (end)	1	2	3	4	5	6
Resale Price	50,000	33,000	20,000	11,000	6,000	1,000
Maintenance cost	10,000	12,000	15,000	20,000	30,000	50,000

16 Solve the following game whose payoff matrix is given below:

$$\begin{matrix}
 & \text{B} \\
 \text{A} & \begin{pmatrix} -6 & 7 \\ 4 & -5 \\ -1 & -2 \\ -2 & 5 \\ 7 & -6 \end{pmatrix}
 \end{matrix}$$

- 17 (a) In a repair shop having a single mechanic, Customers arrive at a rate of 4 per hour. If it takes the mechanic 6 minutes on an average to inspect one item. Find the
- Proportion of time the mechanic is idle
  - Probability that there is at least one customer
  - Average number of customers in the shop
  - Average time spent by a customer in the shop
- (b) Write short notes on following Multi objectives Optimization Techniques:
- PQO
  - MPSO

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**FACULTY OF ENGINEERING****B.E. 4/4 (CSE) I - Semester (Main & Backlog) Examination, December 2017****Subject : Principles and Applications of Embedded Systems****Time : 3 Hours****Max. Marks: 75****Note: Answer all questions from Part-A and any five questions from Part-B.****PART – A (25 Marks)**

- 1 Compare the TWO basic Portability mechanisms of ISA.
- 2 Write the uses of Accelerator and Unified Cache.
- 3 List the reasons for maintaining two separate memories for program and data in Harward architecture.
- 4 Compare Interrupts driven I/O over Busy-wait-I/O.
- 5 What is SoC ? What is the key role of it in Embedded Computing?
- 6 Why to maintain TCB? Write the various fields of it using a neat diagram.
- 7 Name the advantages of EDF algorithms.
- 8 Define Multirate Embedded Application. Give examples.
- 9 What is Emulation? Give examples for it.
- 10 What is debugging? Why debugging is difficult for embedded systems?

**PART – B (50 Marks)**

- 11 (a) Discuss the Design challenges of embedded system applications.  
(b) Explain the process of requirements gathering and specification for GPS moving map.
- 12 (a) Describe how the mechanisms of address translation and memory unit management are implemented in advanced processors.  
(b) Explain how concurrency controlle is achieved during DMA controlling.
- 13 Consider task 'Cale-A' and 'Cale-B' are an Interrupt Service Routine (ISR) sharing the variable X. Assume the frequent problems related to data sharing and suggest the solutions.
- 14 (a) Illustrate the various categories of Multiprocessor architecture with neat figure.  
(b) How would you Schedule following processing using RMS algorithm and explain steps?

Process	Execution time	Period
P1	2	5
P2	4	6
P3	8	13

- 15 (a) Describe the various design principles of RTOS.  
(b) What are the goals of a Embedded system testing process? Explain the test system with one example.
- 16 (a) Explain Memory organization is ARM and SHARC processors.  
(b) Name the hardware and software factors that might be considered while choosing the computing platforms. Explain the reason for each.
- 17 Write short notes on any **two** of the following:
  - (a) Write short notes on interrupts
  - (b) Write short notes on CAN bus protocol
  - (c) Explain Debugging Techniques

**FACULTY OF INFORMATICS****B.E. 4/4 (IT) I-Semester (Main & Backlog) Examination, December 2017****Subject : Intellectual Property Rights (Elective-II)****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 Define special rights of Authors.                  | 2 |
| 2 What is plagiarism?                                | 3 |
| 3 What are the duties of a Patentee?                 | 3 |
| 4 What are the essentials of Possession?             | 3 |
| 5 Examine the protection against unfair competition. | 3 |
| 6 Define international copyright.                    | 2 |
| 7 Discuss the surrender of a Patent.                 | 2 |
| 8 What is piracy of Design?                          | 2 |
| 9 Define cyber squatting.                            | 2 |
| 10 What are non-registrable layout designs?          | 3 |

**PART – B (50 Marks)**

- |  |    |
|--|----|
| 11 Effective enforcement of Intellectual Property encourages the economic development – Comment. | 10 |
| 12 Who is the owner of copyright? How can the ownership of copyright be transferred?             | 10 |
| 13 Examine the provisions of the Paris Convention in respect of trademarks and designs.          | 10 |
| 14 Explain the element of 'Public interest in the Indian Patent system'?                         | 10 |
| 15 How is a design registered in India? What are the essential conditions of registration?       | 10 |
| 16 Explain the essential elements of legal rights.   | 10 |
| 17 Write about the following :   | 10 |
| a) Product patenting of Medicines in India   |    |
| b) GATT  |    |

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## FACULTY OF INFORMATICS

**B.E. 4/4 (IT) I-Semester (Main & Backlog) Examination, December 2017**

**Subject : Wireless and Mobile Communications (Elective-II)**

**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 List the differences between 2G and 3G.   | 2 |
| 2 Explain cellular concept and mention its main advantage.  | 3 |
| 3 Explain the effect of frequency of radio waves with regards to signal penetration into buildings. | 3 |
| 4 What is path loss? Mention some examples leading to path loss.                                    | 2 |
| 5 Explain the concept of FHSS.  | 3 |
| 6 Mention the advantages of spread spectrum.  | 2 |
| 7 Explain briefly the three basic services of GSM.  | 3 |
| 8 Explain the difference between FDMA and TDMA.   | 2 |
| 9 Explain fast retransmit/fast recovery of mobile transport layer.                                  | 3 |
| 10 Explain selective retransmission.  | 2 |

### PART – B (50 Marks)

- |  |    |
|--|----|
| 11 Discuss handoff strategies and capacity of cellular systems.  | 10 |
| 12 a) Explain frequency reuse. Mention its advantages.   | 4  |
| b) Briefly explain ground wave, sky wave and line of sight propagation.                                  | 6  |
| 13 a) Discuss three basic propagation mechanisms.  | 5  |
| b) Explain reflection, blocking and refraction with respect to radio wave propagation.                   | 5  |
| 14 a) Explain the difference of fast and slow frequency hopping spread spectrum. Mention its advantages. | 5  |
| b) Explain CDMA and mention its advantages over FDMA and TDMA.   | 5  |
| 15 Explain the concept of mobile IP with diagrams.   | 10 |
| 16 Explain traditional TCP, snooping TCP and mobile TCP. List its advantages and shortcomings.           | 10 |
| 17 Write short notes on the following :  |    |
| a) Give three examples of wireless communication systems   | 3  |
| b) Optimization  | 4  |
| c) Selective retransmission  | 3  |

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**FACULTY OF INFORMATICS****B.E. 4/4 (IT) I – Semester (Main & Backlog) Examination, December 2017****Subject : Ad-hoc and Sensor Networks (Elective-II)****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  | Write about the functions of beacon frames.                              | 3 |
| 2  | What is the effect of partition on TCP?                                  | 2 |
| 3  | Define location based routing.   | 2 |
| 4  | Differentiate between broadcasting, multicasting and geo-casting.        | 3 |
| 5  | Write about ADDV.  | 2 |
| 6  | Write the QOS parameters in Ad-hoc Wireless Networks.                    | 3 |
| 7  | Write the applications of Adhoc sensor networks.                         | 2 |
| 8  | What are the data dissemination techniques in sensor networks?           | 3 |
| 9  | Write about issues in Adhoc-Wireless Networks.                           | 3 |
| 10 | Write about classification of MAC protocols for Adhoc-Wireless Networks. | 2 |

**PART – B (50 Marks)**

- |       |  |     |
|-------|--|-----|
| 11 a) | Explain about characteristics of MANET.  | 5   |
| b)    | What are the current challenges in Adhoc-and sensor networking?  | 5   |
| 12    | Why routing is different in MANET compared to wired network? Discuss about proposed solutions and algorithms?  | 10  |
| 13    | Explain the challenges in using TCP over MANETS. Discuss about the working of any one TCP proposed for MANETS. | 10  |
| 14 a) | List various applications WSN's? Discuss any two applications in detail.                                       | 5   |
| b)    | Describe about the Sensor Network Hardware with a neat diagram.  | 5   |
| 15    | Discuss various performance metrics used in practice to determine the performance of MAC protocol for WSN's.   | 10  |
| 16    | Explain in detail about the following two protocols with respect to MANET's.                                   | 5+5 |
| a)    | CEDAR  |     |
| b)    | ODMRP  |     |
| 17    | Write a short notes on any two :   | 5+5 |
| a)    | Co-operation in MANET's  |     |
| b)    | Key Management   |     |
| c)    | QOS issue in Adhoc Network   |     |

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**FACULTY OF INFORMATICS**

**B.E. 4/4 (IT) I-Semester (Main & Backlog) Examination, December 2017**  
**Subject : Distributed Systems (Elective-II)**

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  | Define Distributed system? Why is middleware very important?                                    | 3 |
| 2  | What is meant by Scalable System?   | 2 |
| 3  | List out main applications of message passing interface.  | 2 |
| 4  | Explain the principle in remote procedure calls between a client and server.                    | 3 |
| 5  | What is concurrent server?  | 2 |
| 6  | Define Name resolution.   | 2 |
| 7  | How is security addressed in Globe system?  | 3 |
| 8  | What is the difference between remote objects and distributed objects?                          | 3 |
| 9  | What are the responsibilities of QoS manager in multimedia systems?                             | 3 |
| 10 | What are three parameters used when it comes to processing and transporting multimedia streams? | 2 |

**PART – B (50 Marks)**

- |    |   |        |
|----|---|--------|
| 11 | List out the challenges of distributed system? Explain in detail.   | 10     |
| 12 | a) Write the design issues of RMI.<br>b) Explain about message oriented transient communication.  | 5<br>5 |
| 13 | a) Describe general issues while designing server.<br>b) Explain about iterative name resolution mechanism.   | 5<br>5 |
| 14 | a) Explain about Globe Distributed shared objects.<br>b) Explain Naming Feature in CORBA.   | 5<br>5 |
| 15 | a) Explain about Resource scheduling for resource management in distributed multimedia system.<br>b) What is the importance of low latency communication in distributed multimedia systems? | 7<br>3 |
| 16 | a) Explain about agent technology and use of agents in distributed systems.<br>b) Explain about hierarchical approach in mobile entities.   | 5<br>5 |
| 17 | Write short notes on :<br>a) Threads in Distributed system<br>b) Security in DCOM   | 10     |

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**FACULTY OF ENGINEERING****B.E. 4/4 (ECE) I - Semester (New) (Main) Examination, December 2017****Subject: Embedded Systems (Elective – II)****Time: 3 Hours****Max. Marks: 75****Note: Answer all questions from Part A and any five questions from Part B.****PART-A (25 Marks)**

1. Differentiate between Embedded System and General purpose computing system? 3M
2. List the applications of Embedded Systems 2M
3. Explain any three data processing instruction of ARM processor 3M
4. Draw and explain the configuration of CPSR register 2M
5. Discuss about PCI/PCI-X Buses 3M
6. Distinguish between Synchronous, Iso-synchronous and Asynchronous communication 2M
7. What is a locator? 2M
8. Differentiate between cross compiler and cross assembler 3M
9. Why is host system used for most stages of development, test and simulation 2M
10. What is a logic analyzer? What is the use of logic analyzer during the development phase? 3M

**PART - B (50 Marks)**

11. a) Describe various hardware components of embedded system 6M  
b) Discuss about the challenges in embedded systems 4M
12. a) With the help of a neat diagram, explain the architecture of ARM core 7M  
b) Differentiate between RISC and CISC processors 3M
13. a) Discuss in detail about USB Bus 6M  
b) Describe TCP/IP protocol 4M
14. a) Explain in detail about the development process of an embedded system with the help of a design cycle? 6M  
b) Discuss about ROM Emulator 4M
15. a) Describe a case study of Automatic vending machine 8M  
b) How is the final system different from a target system 2M
16. a) Explain about the design process in Embedded System 6M  
b) Explain the 5-stage pipeline of ARM9 processor 4M
17. a) Describe I2C protocol 5M  
b) Explain about In-circuit emulator 5M

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# FACULTY OF ENGINEERING

B.E. 4/4 (ECE) I – Semester (New) (Main) Examination, December 2017

Subject: Entrepreneurship (Elective – III)

Time: 3 Hours

Max.Marks: 75

Note: Answer all questions from Part A and any five questions from Part B.

## PART – A (10x2.5 = 25 Marks)

- 1 Define (SSI) Small Scale Industries
- 2 Define Ancillary Industries
- 3 Define Personality
- 4 Define Entrepreneurship
- 5 Define Leadership
- 6 Define Partnership
- 7 Define Project Management
- 8 Define three time estimates in Network Analysis
- 9 What is change behaviour?
- 10 Given the project activities – construct Network Diagram.

Activity	A	B	C	D	E	F	G
Predecessor	0	0	A	A	B	C	D,E

## PART – B (5x10 = 50 Marks)

- 11 a) Explain the forms of Business Ownership with atleast two advantages and disadvantages in each form. 5
- b) What are the sources of ideas? Give an example. 5
- 12 a) What are the characteristics of an entrepreneur? 5
- b) Define objectives of Small Scale Industries. 5
- 13 a) Define project formulation and explain the concept of financial analysis and its contribution in project formulation. 5
- b) Explain demand and supply gap with an example. 5
- 14 a) Define Women Entrepreneurship. What are the characteristics of Women Entrepreneurship? 5
- b) Explain the sources of project financing in India. 5

Code No. 517

- 15 a) Briefly discuss behavioural aspects of an entrepreneur. 5  
 b) Define Network analysis. Differentiate between PERT & CPM. 5
- 16 a) Explain the leadership concepts. 5  
 b) Construct network diagram and determine critical path method. 5

Activity	A	B	E	F	G	H	I	J	K
Immediate predecessor	--	A	B	E	D,F	E	H	G,I	J
Duration	13	8	11	10	8	6	7	14	18

- 17 Construct Network diagram and determine EP critical path method. Find out ES, EF, LS, LP and float. 10

Activity	A	B	C	D	E	F	G	H	I	J	K
Immediate predecessor	--	--	A	B	C	C	C,D	F,G	E	I	H
Optimistic	2	8	7	6	9	10	11	6	4	3	1
Pessimistic	4	8	11	6	11	18	11	14	6	5	1
Most likely	3	8	11	6	11	18	11	14	6	5	1

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**FACULTY OF ENGINEERING****B.E. 4/4(ECE)I-Semester(New) (Main) Examination, Dec, 2017****Subject : Digital Signal Processor & Archit. (Elective-II)****Time : 3 hours****Max. Marks : 75****Note : Answer all questions from Part-A and any Five Questions from part-B****PART – A**

1. Define dynamic range and resolution. 2M
2. Using 16 bits for the mantissa and 8 bits for the exponent, what is the range of numbers that can be represented using the floating point format similar to IEEE-754? 3M
3. Write the features of TMS320C54x DSP processor? 2M
4. What is the role of ARAU0 and ARAU1 in the architecture of TMS320C54x processor? 3M
5. How interrupts are handled by TMS320C54x processor? 3M
6. Describe any two application specific instructions. 2M
7. What is mean by duplicate filter banks in ADSP 218 x processor? 2M
8. What are the major blocks of ADSP218 x architecture? 3M
9. What are the peripherals available on C54x DSP processor? 3M
10. How many address lines are required to access all locations of an 16K X 16 SRAM? 2M

**PART – B**

11. a) Explain , how scaling prevents overflow in butterfly computations. 5M  
b) Describe briefly about sources of errors in DSP processor. 5M
12. a) Explain about architectural features of basic DSP with various computational blocks. 5M  
b) With a neat block diagram explain the functions of address generation unit of DSP architecture. 5M
13. a) Explain the circular addressing mode with an example for TMS320C54x DSP processor 6M  
b) Describe the operation of the following instructions of TMS 320 C 54 xx processor, with an example. 1) MAC; 2) RPT ; 3) MPY. 4M
14. a) Explain MAC unit of ADSP218 processor with block diagram. 5M  
b) Explain the DIVSQ instruction of ADSP218x processor with block diagram. 5M
15. a) Explain an interface between an A/D converter and the TMS320C54XX processor in the programmed I/O mode. 6M  
b) Briefly explain parallel I/O interface. 4M
16. a) Describe the MAC unit of TMS 320C54 xx processor with a neat block diagram. 5M  
b) Explain the concept of pipelining and how pipeline depth is measured? 5M
17. Write short notes on:
  - a) Interrupts of TMS320C54xx processors. 5M
  - b) Memory space of TMS320C54xx processor. 5M

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**FACULTY OF ENGINEERING****B.E. 4/4 (ECE) I - Semester (New) (Main) Examination, December 2017****Subject: Optimization Techniques (Elective - II)****Time: 3 Hours****Max. Marks: 75****Note: Answer all questions from Part - A and any five questions from Part - B.****PART-A (25 Marks)**

1. Differentiate between Feasible, Infeasible and optimal points. 3
2. What is sensitivity analysis. 2
3. State two advantages of direct methods over gradient based methods. 3
4. If a point satisfies all the KT conditions, we can say that the point is  
A). optimal B). not optimal C). May be optimal D). None 2
5. State the conditions for which the cutting plane method is more efficient. 2
6. What are the advantages of complex search method. 3
7. Explain the criteria for selection of the initial temperature in Simulated Annealing. 2
8. State the advantages of Monte Carlo method. 3
9. Explain the significance of cross over. 3
10. State the schema theorem 2

**PART – B (50 Marks)**

11. a) List the applications of Optimization Techniques 5
- b) A city requires at least 4 buses between 12pm and 4am, 8 buses between 4am and 8am, 10 buses between 8am and 12am, 7 buses between 12am and 4pm, 12 buses between 4pm and 8pm and 4 buses between 8pm and 12pm. Formulate a LPP to minimize the number of buses that can handle the transportation needed if every bus can operate only 8 successive hours, a bus can start only over successive 4-hour interval. 5
12. a) Using simplex algorithm, maximize the function  $F=19x_1+7x_2$  6  
Subject to  

$$7x_1+6x_2 \leq 42$$

$$5x_1+9x_2 \leq 45$$

$$x_1 - x_2 \leq 4$$

$$x_1, x_2 \geq 0.$$
- b) What is the effect in the solution if the right side value is changed from 4 to 7. 4
13. a) Compare Fibonacci and Golden section methods. 4
- b) Find the minimum value of the function  $f(x)= 2x^2+ 10x+10$  in the interval (0,5) using Golden section method. (Show atleast two iterations). 6
14. a) State the significance of K-T conditions for NLP problem. 4
- b) Check whether the point  $(0,6)^T$  is a K-T point or not for the problem. 6

Minimize  $f(x) = x_1^2 + x_2 - 6$   
 subject to  $x_2 \geq x_1$   
 and  $x_1 \geq 0$

15. Using the Complex search method, minimize 10  
 $f(x) = x_1^2 + 2x_2^2$  subject to  $x_1^2 + x_2^2 = 5$  and  $0 \leq x_1, x_2 \leq 4$   
 Choose  $\alpha = 0$  and all termination parameters equal to 0.01.
16. a) State the Metropolis criteria. 4  
 b) Minimize  $f(x) = x_1 + 2x_2^2$  Using Simulated Annealing method with initial point  $(1, 1)^T$   
 subject to  $0 \leq x_1, x_2 \leq 3$  Choose initial temperature,  $T=100$  and  $\epsilon = 10^{-3}$ . 6
17. Consider the problem, Maximize  $F = 3x_1 + x_2^2$ ,  $0 \leq x_1, x_2 \leq 4$   
 a) How many bits are required to decode the variables to an accuracy of 3 decimal places using GA. 5  
 b) Consider the 12 bit length chromosome. Let the first 7 bits represent the variable  $x_1$  and the last 5 bits represent  $x_2$ . Evaluate the fitness function given in (a). 5  
 $v_1 = [1\ 1\ 0\ 1\ 0\ 0\ 1 : 0\ 1\ 1\ 0\ 1]$

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**FACULTY OF ENGINEERING****B.E. 4/4(ECE)I-Semester(New) (Main) Examination, Dec, 2017****Subject : System Automation &Control (Elective - II)****Time : 3 hours****Max. Marks : 75****Note : Answer all questions from Part-A and any Five Questions from part-B****PART – A**

1. How can we provide protection to circuits? (2)
2. Differentiate between natural and forced response. (2)
3. Illustrate and mention the building blocks in the thermal system. (3)
4. Give the basic symbols and their meaning in ladder programming of the PLC. (2)
5. What do you mean by linearity error? (2)
6. Draw the block diagram of the structural elements of industrial control. (3)
7. What is the overall transfer function of a negative feedback system with  
 $G(s)=4/s(s+1)$  and  $H(s) =1/s$  . (2)
8. Give the block diagram of an actuator system. (3)
9. Graphically illustrate the effect of pole location on the transient response of  
a first and second order system. (3)
10. Briefly describe the industrial robot SCARA. (3)

**PART – B**

11. Explain in detail the type of automation systems. (10)
12. Explain in detail the mathematical model of a mechanical system. Illustrate  
using the example of a car moving on a road. (10)
13. Explain in detail the low and high pressure measurement using sensors. (10)
14. Explain in detail the working of a domestic washing machine. (10)
15. a) What are the various profiles used to calculate the trajectory in motion control? (5)  
b) Write in detail about the feedback devices and motion I/O in motion controller. (5)
16. a) Give the architecture of 8051 and explain it in detail. (7)  
b) Write an ALP to add two numbers stored in memory. Result should be stored  
back in the memory. (3)
17. Write short notes on: (10)
  - a) Force and torque measurement
  - b) Grippers
  - c) Hierarchical structure in industrial automation systems.

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**FACULTY OF ENGINEERING****B.E. 4/4(ECE), I Semester (NEW) (Main) Examination, Dec, 2017****Subject: Internet of Things(Elective - II)****Time: 3 hours****Max. Marks: 75****Note: Answer all questions from Part-A and any Five Questions from part-B****PART – A**

Answer all questions

1. Enlist three applications for IoT for smart transportation. [2]
2. Briefly explain the objective of smart energy using IoT. [3]
3. What is Hadoop, how is it used in handling Big Data. [3]
4. Why is https more secure than http. [2]
5. What are the various techniques in debugging an Arduino. [3]
6. Briefly explain additive and subtractive manufacturing with example. [2]
7. Write an instruction to store data in flash memory. [2]
8. What are the various data types in python? Give example. [3]
9. What is WAMP? Give the structure of WAMP session between client and router. [3]
10. Enlist any three amazon web services for IoT. [2]

**PART – B**

11. a) What is cloud computing and its components. What are the various service models in cloud computing. [7]  
b) Briefly explain the IoT equation. [3]
12. a) Draw the IPv4 header frame format and explain each field in it. [7]  
b) What is a MAC address, explain with example. [3]
13. a) Explain the various low power communication technologies used in IoT devices. [7]  
b) Explain the axis movement of CNC mills. [3]
14. a) Enlist the features of python as a multi paradigm programming language. [7]  
b) Explain the MQTT protocol and elaborate the role of a message broker in MQTT. [3]
15. a) Write a python program for controlling LED with a switch for Raspberry Pi . [6]  
b) What are the various business models for IoT? [4]
16. a) What are the hardware features of Raspberry Pi board. [7]  
b) Give the structure of publish-subscribe messaging using WAMP-Autobahn framework. [3]
17. Write short note on: [4+3+3]
  - a) Memory allocation in HEAP
  - b) DHCP
  - c) Xively IoT cloud

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