Total No. of Questions - 9] Total Pages : 3

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5227

B.Tech. IVth Semester Examination

SYSTEM ANALYSIS AND DESIGN (CSE/IT)

Paper–IT-(ID)-4004

Time : Three Hours] [Maximum Marks : 100

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/ continuation sheet will be issued.

Note : Attempt *five* questions in all, selecting *one* question each from Section A, B, C and D, and Q. No. 9 of Section E (compulsory).

SECTION–A

1. (a) Describe the various tools used for feasibility and cost analysis.

(b) What is System planning ? Explain. 10+5

2. (a) Discuss the importance of various phases of system development life-cycle.

(b) What is the role of system designers ? 10+5

SECTION–B

3. Explain various symbols used in ER-diagrams. Draw an ER diagram for a drug store. 15

4. (a) Discuss the techniques used to collect the requirements.

(b) What are Functional diagrams ? Give an example. 10+5

SECTION–C

5. Compare and construct between the following :

(a) Input design and Output design.

(b) System design and Database design. 15

6. (a) Explain various processing methods w.r.t. system architecture.

(b) What are the goals of physical database design ? 10+5

SECTION–D

7. (a) What is the need of documentation ? What are the different types of documentation ?

(b) Distinguish between debugging and testing. 10+5

8. (a) Give the structure of the maintenance term.

(b) Discuss various user training aids available. 8+7

SECTION–E

(*Compulsory*)

9. Answer *all* the following in brief :

(a) What is the difference between System planning and System analysis ?

(b) List various types of systems.

(c) What are the different levels of testing ?

(d) What is Adaptive maintenance ?

(e) Give a data flow diagram for a departmental store.

(f) How do system analysis and design relate to each other?

(g) What are the main components of a database and the role of each component ?

(h) Define Operational feasibility.

(i) What is Coding ? Explain.

(j) How do you manage the performance of a system ?

10×4=40

[Total No. of Questions - 9] [Total No. of Printed Pages :3]

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5647

B.Tech. IVth Semester Examination

System Analysis and Design (CSE/IT)

Paper - IT(ID) 4004

Time Allowed : 3 Hours **Maximum Marks : 100**

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary / continuation sheet will be issued.

Note : Attempt **one** question from each section. Section E is **compulsory.** All questions carry equal marks.

Section - A

1. What is system Analysis and Design? Discuss the duties of Systems Analyst.

2. Describe Library as a system. What is the input, the output, the boundary, the components, their interrelationships, the constraints, the purpose, the interfaces, the environment? Draw a diagram of this system.

Section - B

3. Discuss the importance of data flow diagrams? What is the difference between a data flow diagram and context diagram.

4. A.car rental company wants to develop an automated system that would handle car reservations, customer billing and car auctions. Usually a customer reserves a car, picks it up and then returns if after certain period of time. When car is returned, the customer receives a bill and pays the specified amount. In addition to renting out cars, every six months of so, the auto rental company auctions the cars that have accumulated over 20,000 miles. Draw the E R Diagram for the system.

Section - C

5. What input design? Discuss the importance of Human computer interaction.

6. What are the various system design tools? Explain with example.

Section - D

7. What are the steps in the implementation of the system? Explain with example.

8. Discuss the importance of documentation and its needs.

Section - E

9. a) What are various attributes of Software Quality?

   b) What is the difference between Inspections & Walkthroughs?

   c) What is a Validation Techniques?

d) Explain in brief various Software Testing strategies.

e) What are the different objectives kept in mind while doing integration testing?

f) For designing a Railway ticket reservation system which language out of Structured language & OOL should be chosen?

g) At what place are the Alpha Beta testing is done?

h) What is the difference between integration and module testing?

i) What are the training needs for the system implementation?

j) What is a parallel run?

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Total No. of Questions - 9] Total Pages : 3

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5026

B.Tech. IVth Semester Examination

SYSTEM ANALYSIS AND DESIGN (CSE/IT)

Paper : IT (ID)-4004

Time : Three Hours] [Maximum Marks : 100

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/ continuation sheet will be issued.

Note : Attempt *one* question from each section. Section E is compulsory.

SECTION–A

1. What are the various types of the System ? Explain with example.

2. What is Preliminary investigation ? Outline the fact finding techniques.

SECTION–B

3. What are the different methods of collecting user requirements ? Explain with example.

4. With an example explain how ER diagrams can be used for modelling ?

SECTION–C

5. Sushmita is trying to decide what graduate programs she will apply to. She wants to stay in South India, but if a program is considered one of the top 10 in the country, she is willing to move to another part of the country. Sushmita is interested in MBA, MIT and MIS programs. An MBA program must have atleast one well known faculty member and meet her location recruitment's before she will consider applying to it. Use a decision tree and decision table to represent this logic.

6. What is Output design ? Discuss the importance of Human computer interaction.

SECTION–D

7. What are the documentations requirements for the system ? Explain with example.

8. What are the steps in the implementations of a system ? Explain with example.

SECTION–E

9. Answer the following questions :

(i) Define Environment of a system.

(ii) List the four skills needed by the successful systems analyst.

(iii) What is Data dictionary ?

(iv) List any *three* traditional methods of collecting systems requirements.

(v) Define Prototyping for a system.

(vi) What is Reusability of code ?

(vii) What is meant by Scalability ?

(viii) List out the three characteristics of Usability.

(ix) What is Module coupling ?

(x) What are the steps in Information collection ?

Total No. of Questions - 9] Total Pages : 2

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5306

B.Tech. IVth Semester Examination

SYSTEM ANALYSIS AND DESIGN (CSE/IT)

Paper : IT (ID)–4004

Time : Three Hours] [Maximum Marks : 100

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/ continuation sheet will be issued.

Note : Attempt *one* question each from Section A, B, C and D. Section E is compulsory.

SECTION–A

1. What are the various types of the system ? Explain with example.

2. What is Preliminary investigation ? Outline the fact finding techniques.

SECTION–B

3. How ER diagrams can be used for modelling of a system ?

4. What is User interface design of a system ? Explain the various types of user interfaces for a system.

SECTION–C

5. What is Input design ? Discuss the importance of human-computer interaction.

6. How the testing plans are made for a system ? Explain.

SECTION–D

7. What are the documentation requirements for the system ? Explain with example.

8. What are the steps in the implementation of a system ? Explain with example.

SECTION–E

9. (i) What is Data dictionary ?

(ii) What is Probabilistics system ?

(iii) What is Black box system ?

(iv) What is Alpha testing ?

(v) What is social feasibility of a system ?

(vi) What is a HIPO diagram ?

(vii) What is Recovery system ?

(viii) What is Decision tree ?

(ix) What are the various information gathering techniques ?

(x) What is the major duty of a system analyst ?

(2056) Total Pages : 3

6066

B. Tech. 4th Semester Examination

COMPUTER ARCHITECTURE (CSE/IT)

Paper–IT-(ID)-4001

(New Syllabus)

Time : Three Hours

Maximum Marks : 100

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : *Answer five questions in all, selecting one question from each* **Section.** *Question No. 9 (Section–E) is* ***compulsory.***

Section–A

1. What is Amdahl's law ? Discuss in detail. 15

2. What do you mean by addressing modes ? Discuss various addressing modes of the machine you are familiar with. 15

Section–B

3. What do you mean by pipeline hazards ? Discuss various types of hazards ? 15

4. Explain in detail the basic pipeline for DLX. 15

Section–C

5. Explain the multilevel hierarchy of memory. Differentiate between memories on the basis of memory retention and access mode. 15

6. Write short notes on following :
   (i) RAID
   (ii) UNIX file system performance
   (iii) SASD (Sequential Access Storage Device) Vs DASD (Direct Access Storage Device) 15

Section–D

7. What do you mean by computer network ? What are the uses of computer network ? Discuss various network topolo 15

8. Write short notes on :
   (i) Distributed shared Memory architectures
   (ii) Synchronization. 15

Section–E

9. Explain the following terms :
   (i) Cache memory

(ii) Memory protection

(iii) Linkage between an I/O bus and I/O device

(iv) Fiber optics

(v) Application domain

(vi) Performance metrics for communication mechanisms

(vii) MIPS R4000 Pipeline

(viii) Advantages of MIMD machine

(ix) TCP/IP

(x) Routers.

4×10=40

Total No. of Questions - 9] Total Pages : 3

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5225

B.Tech. IVth Semester Examination

COMPUTER ARCHITECTURE (CSE/IT)

Paper–IT(ID)-4001

Time : Three Hours] [Maximum Marks : 100

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/ continuation sheet will be issued.

Note : Attempt *five* questions in all, selecting *one* question each from Section A, B, C and D, and Q. No. 9 of Section E (compulsory).

SECTION–A

1. (a) Explain quantitative principles of computer design. 8

(b) Discuss an encoding technique for an instruction set. 7

2. (a) Draw block diagram of memory hierarchy, and explain it. 7

(b) Explain classification of instruction set architecture. Also discuss memory addressing techniques. 8

SECTION–B

3. What is Pipeline architecture ? Discuss how pipeline is implemented, with reference to MIPS R4000 pipeline. 15

4. (a) Discuss the concept of instruction level parallelism and its advantages. 10

(b) Explain how data hazards can be reduced. 5

SECTION–C

5. (a) A block set associative cache consist of a total 128 cache blocks with 2 blocks per set. The main memory contains 4 K blocks with 16 words per block. Draw a figure explaining the mapping and show the partitions of an address into TAG, SET and Word. 10

(b) Explain how cache misses can be reduced. 5

6. (a) Discuss two storage devices in detail. 10

(b) Explain how communication takes place between I/O device and memory. 5

SECTION–D

7. Discuss what is an interconnection network and its advantages ? Also describe two schemes–Time shared common bus and Cross bar switch for inter-connecting network. 15

8. (a) Discuss characteristics of Multiprocessors. 5

(b) What do you mean by Shared memory architecture ? Explain difference between Shared and Distributed memory architectures. 10

SECTION–E

(Compulsory)

9. Explain *all* the following briefly :

(a) Cache penalty.

(b) RAM & ROM.

(c) Set associative mapping.

(d) Memory protection.

(e) Multistage switching network.

(f) Cache hit–ratio.

(g) Memory table.

(h) UNIX file system performance.

(i) Synchronization in Multiprocessor.

(j) DLX architecture characteristics. 4×10=40

[Total No. of Questions : 9] [Total No. of Printed Pages :3]
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5645

B.Tech. IVth Semester Examination

Computer Architecture (CSE/IT)

Paper - IT(ID) 4001

Time Allowed : 3 Hours **Maximum Marks : 100**

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary / continuation sheet will be issued.

Note : Answer ***five*** questions in all, selecting ***one*** question each from *section*. Question No. 9 *(Section E)* is ***compulsory.***

Section - A

1. What is Amdahl's law? Discuss in detail. **(15)**

2. a) Illustrate the functioning of 'Instruction Execution cycle'. **(7½)**

b) What is specified by addressing modes? Explain immediate, relative and indexed mode with examples. **(7½)**

Section - B

3. What do you mean by pipeline hazards? Discuss the different classes of hazards? **(15)**

4. Write short note on **(15)**

i) MIPS R 4000 Pipeline

ii) ILP

Section - C

5. Define virtual memory. How it is implemented? Explain in detail. **(15)**

6. Write short note on following: **(15)**

i) RAID

ii) UNIX file system performance.

iii) SASD (Sequential Access Storage Device) Vs DASD (Direct Access Storage Device).

Section - D

7. What do you mean by transmission media? Discuss various types of transmission media. Give their merits and demerits. **(15)**

8. a) What are the performance metrics for communication mechanism in multiprocessor? **(08)**

b) What are the advantages of different communication mechanisms? **(07)**

Section - E

9. Explain following terms: (4×10=40)

i) Displacement addressing mode

ii) Locality of reference

iii) Switch topology

iv) Magnetic disk

v) Data type for DLX

vi) Hit Time

vii) TCP/IP

viii) Cache performance

ix) Advantages of MIMD machine

x) Cache hit and cache miss.

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Total No. of Questions : 9] Total Pages : 3

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B.Tech. IVth Semester Examination

COMPUTER ARCHITECTURE (CSE/IT)

Paper : IT-ID-4001

Time : Three Hours] [Maximum Marks : 100

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/ continuation sheet will be issued.

Note : Answer *five* questions in all, selecting *one* question each from Sections A, B, C and D. Q. No. 9 (Section E) is compulsory.

SECTION–A

1. (a) Discuss the different trends in Computer usage and Implementation technology. 7½

(b) Discuss the different factors required in measuring the performance. 7½

2. What do you mean by Addressing modes ? Discuss various addressing modes of the machine you are familiar with. 15

SECTION–B

3. What is Pipelining ? Discuss the basic pipeline for DLX. 15

4. What do you mean by Dynamic scheduling ? Discuss the Tomasulo approach in detail. 15

SECTION–C

5. (a) Define principle of "Locality of reference". Write short note on the concept of cache memory. 7½

(b) What is the purpose of an I/O interface ? Explain the linkage between an I/O bus and I/O device. 7½

6. (a) Discuss the different Storage devices in detail. Why CD-ROM is more reliable than floppy disc ? 10

(b) Explain the communication process between I/O and CPU. 5

SECTION–D

7. Write short notes on the following :

(i) Switch topology.

(ii) Fat tree topology.

(iii) Ring topology. 15

8. What is Multiprocessor cache coherence ? Discuss the various basic schemes for enforcing coherence. 15

SECTION–E

9. Explain the following terms :

(i) Interrupt cycle.

(ii) MPP network.

(iii) Routers.

(iv) Data hazards.

(v) Components of Fibre optic network.

(vi) Advantages of Dynamic scheduling over Static scheduling.

(vii) Memory protection.

(viii) Uses of Computer network.

(ix) Cache coherence.

(x) Advantages of MIMD machine. 4×10=40

Total No. of Questions - 9] Total Pages : 5

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5031

B.Tech. IVth Semester Examination

PROBABILITY/STATISTICS/QUEUEING THEORY (I.T.)

Paper : AS-4001

Time : Three Hours] [Maximum Marks : 100

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/ continuation sheet will be issued.

Note : Attempt *five* questions in all by selecting *one* question from each Section A, B, C and D. Section E is compulsory. All questions from questions 1 to 8 carry equal marks (15 each) and Q. 9 carries 40 marks.

SECTION–A

1. (a) If A and B are any two events, then prove that

$$P(A \cup B) = P(A) + P(B) - P(A \cap B)$$

What happens if A and B are mutually exclusive ?

(b) In a PC factory, machines A, B and C manufacture respectively 25%, 35% and 40% of the total. Of their output 5, 4 and 2 per cent are defective PCs. A PC is selected at random from the product and is found to be defective. What is the probability that it was manufactured by machine B ?

(c) Prove addition theorem of Mathematical expectation.

2. (a) Find the Standard deviation and Mean of the discrete distribution :

x :	8	12	16	20	24
$P(x)$:	$\frac{1}{8}$	$\frac{1}{6}$	$\frac{3}{8}$	$\frac{1}{4}$	$\frac{1}{12}$

(b) Find the Mean, Variance and the Coefficients β_1, β_2 of the distribution $dF = Kx^2e^{-x}dx$, $0 < x < \infty$.

(c) State and prove Chebychev inequality.

SECTION–B

3. (a) Calculate the Mean, Variance, the Coefficients β_1, β_2 and moment generating function of Poisson's distribution.

(b) Fit a Binomial distribution to the data

x :	0	1	2	3	4	5	6
f :	6	20	28	12	8	6	0

4. (a) Write p.d.f. of Normal distribution. Prove that for a normal distribution:

Mean deviation $\simeq \frac{4}{5} \times$ Standard deviation.

(b) In a distribution exactly normal, 7% of the items are under 35 and 89% are under 63. What are the Mean and Standard deviation of the distribution ?

SECTION–C

5. (a) Find the Correlation coefficient between x and y from the data :

x :	78	89	97	69	59	79	68	57
y :	125	137	156	112	107	138	123	108

(b) The lines of Regression in a bivariate distribution are given by $x+2y=5$ and $2x+3y=8$ and $\sigma x^2=12$.

Find (i) the coefficient of correlation, (ii) σy^2, and (iii) the mean of the distribution.

6. (a) Find Mean, Median, Mode, Lower and Upper quartiles from the data :

Marks	: 0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80
No. of students (f) :	15	20	25	24	10	33	71	51

(b) The three variables X_1, X_2 and X_3 are measured from their means : $\sigma_1=2.7$, $\sigma_2=2.4$, $\sigma_3=2.7$

$r_{12}=0.28$, $r_{23}=0.49$, $r_{31}=0.51$

Calculate $r_{13.2}$. If $X_4=X_1+X_2$, obtain r_{42}, r_{43} and $r_{43.2}$.

SECTION–D

7. (a) Show that the average number of units in a M/M/1 system is equal to $\frac{\rho}{1-\rho}$. Also show that the average length of the waiting line is $\rho^2/(1-\rho)$.

(b) Write notes on :

(i) Jackson's theorem.

(ii) Imbedded Morkov chains.

(iii) Delay and Waiting times.

8. (a) Enumerate different types of Queueing models and give steady state solution of one of them.

(b) At what average rate must a clerk at a supermarket work in order to ensure a probability of 0.90 that the customer will not have to wait longer than 12 minutes. It is assumed that there is only one counter, to which customers arrive in a Poisson fashion at an average rate of 15/hour. The length of service by the clerk has exponential distribution.

SECTION–E

9. Answer the following questions :

(a) Find the probability that a leap year selected at random, will contain 53 Sundays.

(b) Write short note on expected values of Random variables.

(c) Obtain mean and variance of Geometric distribution.

(d) "The mean of a binomial distribution is 5 and its Standard deviation is 3." What is the fallacy, if any, in this statement ?

(e) Show that for any discrete distribution the standard deviation is not less than the mean deviation from the mean.

(f) What are the merits and demerits of Median ?

(g) Define Correlation, Rank correlation and Partial correlation.

(h) Define Transient and Steady states.

(i) Explain Poisson's queueing systems.

(j) For the case of two channels, Poisson's arrivals and exponential service, show that the probability of both channels being empty is $\frac{2\mu - \lambda}{2\mu + \lambda}$.

Total No. of Questions - 9] Total Pages : 3

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5030

B.Tech. IVth Semester Examination

DIGITAL COMMUNICATION (IT)

Paper : EC-4010

Time : Three Hours] [Maximum Marks : 100

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/ continuation sheet will be issued.

Note : Attempt *five* questions in all, selecting *one* question each from Sections A, B, C and D. Section E is compulsory.

SECTION–A

1. (a) State and prove Sampling Theorem. Give its applications. 10

(b) Explain Quantization of a signal with the help of suitable example. 10

2. (a) Find the Nyquist rate and Nyquist interval for the signal

$$x(t) = \frac{1}{2\pi} \cos(4000\,\pi t) \cos(1000\,\pi t).$$ 10

(b) Discuss the noise effects of Delta modulation. 10

SECTION–B

3. (a) Explain advantages and disadvantages of Differential phase shift keying. 10

(b) Explain the generation of quadrature PSK signal. Also compare it with DPSK signal. 10

4. (a) Explain the power spectral density of BPSK and QPSK signals. 10

(b) Explain the Binary frequency shift keying receiver. 10

SECTION–C

5. (a) Derive the probability of error of the matched filter. 10

(b) Prove that for a matched filter, the maximum signal component occurs at $t = T$ and has magnitude equal to E (energy of signal). 10

6. (a) Explain the block diagram of a Correlator. 10

(b) Derive the probability of Error of the optimum receiver. 10

SECTION–D

7. (a) Derive an expression for o/p signal to noise ratio in PCM. 10

(b) What are the effects of Thermal noise on the signal ? 10

8. (a) Explain the difference between Message switching, Packet switching and Circuit switching. 10

(b) What do you mean by ISDN ? Discuss its main features. 10

SECTION–E

9. Answer the following questions :

(a) Compare the Delta modulation and Adaptive modulation.

(b) What is Quantization error ? Explain.

(c) Compare Uniform quantization and Non-uniform quantization.

(d) Derive the bandwidth of BPSK signal.

(e) Explain advantages and disadvantages of BPSK signal.

(f) What is White noise ? Describe.

(g) How Matched filter differs from Optimum filter ?

(h) Draw block diagram of PCM receiver.

(i) Compare LAN and MAN.

(j) What is ATM ? Discuss its important features. 20

Total No. of Questions - 9] Total Pages : 3

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5028

B.Tech. IVth Semester Examination

OPERATING SYSTEM CONCEPTS (IT)

Paper : IT-4002

Time : Three Hours] [Maximum Marks : 100

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/ continuation sheet will be issued.

Note : Attempt *five* questions in all, selecting *one* question from each Section A, B, C and D and all the sub-parts of the question in Section E. Use of Non-programmable calculator is allowed.

SECTION–A

1. Define the following :

(i) Parallel systems.

(ii) Distributed systems.

(iii) System calls. 5×3=15

2. Explain the following :

(i) CPU scheduling.

(ii) Operating system services.

(iii) Co-operating processes. 5×3=15

SECTION–B

3. Explain the following :

(i) Deadlock prevention.

(ii) Threat monitoring.

(iii) Goals and domain of Protection. 5×3=15

4. Explain the following :

(i) Deadlock avoidance.

(ii) Capability based systems for protection.

(iii) Security measures in Windows NT. 5×3=15

SECTION–C

5. Define the following :

(i) Paging.

(ii) Thrashing.

(iii) Disk reliability. 5×3=15

6. Explain the following :

(i) Segmentation with paging.

(ii) Any two page replacement algorithms.

(iii) Swap-space management. 5×3=15

SECTION–D

7. Describe the following :

(i) Directory structure.

(ii) File Allocation methods. 7½×2=15

8. Explain the following :

(i) File system structure.

(ii) File Access methods. 7½×2=15

SECTION–E

9. Attempt all the questions :

(i) What are the issues in Inter-process communication ?

(ii) What are the states in which a process can be in ?

(iii) What are the advantages of Threads ?

(iv) What are Deadlocks ? How can they be handled ?

(v) What is the need of Encryption and Decryption ?

(vi) What are the disadvantages of Contiguous allocation?

(vii) Discuss the Disk structure.

(viii) What is the significance of Cache memory ?

(ix) Discuss the role of Operating system in file system management.

(x) What are the efficiency considerations in File system interface ? 10×4=40