VARDHAMAN COLLEGE OF ENGINEERING
(AUTONOMOUS)
Two Year M. Tech II Semester Regular Examinations September - 2012
(Regulations: VCE-R11)
COMPUTER NETWORKS
(Computer Science and Engineering)

Time: 3 hours **Max Marks: 60**

Answer any FIVE Questions. All Questions carry equal marks
All parts of the questions must be answered in one place only

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1 a) List the 7 layers in OSI hierarchy and their functions. Why such a hierarchical approach to networking is is utilized.   8M

   b) Consider a wired point-to-point network. List some performance measures.   4M

2 a) Explain the concept of Multiple Access Protocols and give few examples. Explain why researchers proposed new protocols and reason why they are better.   8M

   b) Q: Can I deploy a LAN without IP address? If yes, how are the nodes addressed in such a LAN?   4M

3 a) Consider a wired point-to-point network. All the nodes use the shortest path routing (with hop count metric/cost).
   Q: What is the maximum delay experienced by packets (in the data structure associated with such a network……ignore queuing, propagation and processing delays)   6M

   b) With an example explain the Bellman-Ford algorithm (let there be at least 8 nodes)   6M

4 a) Explain the operation / details of TCP   4M

   b) Explain the reasons why congestion control is needed (with TCP). Explain some congestion control methods with TCP.   8M

5 a) What is the difference between peer-to-peer system and client-server system / network? Give couple of examples of peer-to-peer networks.   7M

   b) Name few application layer based protocols in the internet.   5M

6 a) Explain how Mobile Internet (Mobile IP) protocol works.   6M

   b) Explain details of IEEE 802.11 based wireless network(in terms of the MAC protocols)   6M

7 a) List down some optical networking devices / components and briefly explain their operation.   4M

   b) Explain the concept of WDM used in optical networks.   8M

8 a) Explain the need for VPN's.   6M
   Q: Is it necessary that every node of a VPN should have an IP address. Explain your answer.

   b) What are the design challenges in multimedia networking?   6M

VARDHAMAN COLLEGE OF ENGINEERING
(AUTONOMOUS)
Two Year M. Tech II Semester Regular Examinations September - 2012
(Regulations: VCE-R11)
OPERATING SYSTEMS
(Computer Science and Engineering)

Time: 3 hours   **Max Marks: 60**

Answer any FIVE Questions. All Questions carry equal marks
All parts of the questions must be answered in one place only

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1 a) What are the different states of a process? Explain about the events that cause the transitions among those states. **6M**

   b) What are the relative advantages and disadvantages of kernel level threads over user level threads? **6M**

2 a) Explain about the functionality of monitor construct and write a solution to dining philosophers problem using monitor. **6M**

   b) Consider the following set of processes, with the length of CPU burst times, arrival times and priorities. **6M**

Process	Burst Time	Arrival Time	Priority
P1	10	0	5
P2	12	1	4
P3	6	3	4
P4	8	3	3
P5	13	4	1

Compute average waiting time, turnaround time, response time of the following scheduling algorithms:

i.   FCFS   ii.   Non preemptive SJFS
iii. Non preemptive Priority   iv. Preemptive Priority
v.   SRTF

3 a) Write an algorithm for deadlock detection and trace it with an example. **6M**

   b) Give different methods of recovery from deadlock situation. **6M**

4 a) Describe different structures of page tables. What are the advantages of paging? **6M**

   b) What is working set model? How it is useful for determining the memory requirements of a process. **6M**

5 a) Write about the disk layout of Unix file system. **6M**

   b) Describe different free space management techniques in a file system. **6M**

6 a) What are the different design issues of a distributed system? **6M**

   b) What are the steps involved in a remote procedure call (RPC)? **6M**

7 a) Compare different algorithms for achieving mutual exclusion in a distributed system. **6M**

   b) Explain the working of bully algorithm for election of a coordinator. **6M**

8 Explain about Chandy-Misra-Haas algorithm for detection of deadlocks in a distributed system. What are its drawbacks? **12M**

VARDHAMAN COLLEGE OF ENGINEERING
(AUTONOMOUS)
Two Year M. Tech II Semester Regular Examinations September - 2012
(Regulations: VCE-R11)
CLOUD COMPUTING
(Common to Computer Science and Engineering, Software Engineering)

Time: 3 hours   Max Marks: 60

Answer any FIVE Questions. All Questions carry equal marks
All parts of the questions must be answered in one place only

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1	Explain any six benefits of Software as Service in Cloud computing?	12M
2	List the different cloud applications available in the market? Briefly explain the scenarios/situations of "when to not use clouds".	12M
3	a) Explain the tasks performed by Google applications engine?	6M
	b) Write a short note on IBM offerings towards Cloud computing?	6M
4	Explain the different operational and economical benefits of using clouds?	12M
5	a) Describe any six design principles of Amazon S3 Cloud computing model?	6M
	b) What is REST in Web services? List the different benefits of REST.	6M
6	a) What is SaaS in Cloud computing? Explain different categories of SaaS?	6M
	b) List the prevalent companies and their offerings towards software plus services via Cloud computing?	6M
7	What is the need of virtualization? Define Server virtualization, Application virtualization, Presentation Virtualization.	12M
8	Discuss the various migration issues of the organization towards Clouds?	12M

VARDHAMAN COLLEGE OF ENGINEERING
(AUTONOMOUS)
Two Year M. Tech II Semester Regular Examinations September - 2012
(Regulations: VCE-R11)
DATA WAREHOUSING AND DATA MINING
(Common to Computer Science and Engineering, Software Engineering)

Time: 3 hours   Max Marks: 60

Answer any FIVE Questions. All Questions carry equal marks
All parts of the questions must be answered in one place only

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1   A Spatiotemporal data stream contains information that changes over time, and is in the form of stream data (i.e., the data flow in and out like possible infinite streams).
   a)   Present three application examples of spatiotemporal data mining.   3M
   b)   Identify and discuss the major challenges in spatiotemporal data mining.   3M
   c)   Using one application example, sketch a method to mine one kind of knowledge from   6M
        such stream data efficiently.

2   Suppose that the data for analysis includes the attribute age. The age values for the data tuples are 13,15,16,16,19,20,20,21,22,22,25,25,25,25,30,33,33,35,35,35,35,36,40 45,46,52,70.
   a)   Use smoothing by bin means to smooth the data, using a bin depth of 3. Illustrate your   4M
        steps.
   b)   How might you determine outliers in the data?   4M
   c)   What other methods are there for data smoothing.   4M

3   In Data ware house technology, a multiple dimensional view can be implemented by a relational database technique (ROLAP), or by a multidimensional database technique (MOLAP) or by a hybrid database technique (HOLAP)
   a)   Briefly describe each implementation technique.   6M
   b)   For one technique, explain how each of the following functions may be   6M
        implemented.
                    (i). The generation of a data ware house. (ii). Roll-up and Drilldown
                    (iii). Incremental updating

4   Association rule mining often generates a large number of rules. Discuss effective methods   12M
     that can be used to reduce the number of rules generated while still preserving most of the
     interesting rules.

5   What is associative classification? Why is associative classification able to achieve higher   12M
     classification accuracy than a classical tree method? Explain how associative classification
     can be used for text document classification?

6   Design a Privacy preserving clustering method so that a data owner would   12M
     be able to ask a third party to mine the data for quality clustering without worrying
     about the potential inappropriate disclosure of certain private or sensitive
     information stored in the data.

7   The concept of micro clustering has been popular for on-line maintenance of clustering   12M
     information for data streams. By exploring the power of micro clustering, design an
     effective density based clustering method for clustering evolving data streams.

8   TF-IDF has been used as an effective measure in document classification.
   a)   Give one example to show that TF-IDF may not be always a good measure in document   6M
        classification.
   b)   Define another measure that may overcome this difficulty.   6M

VARDHAMAN COLLEGE OF ENGINEERING
(AUTONOMOUS)
Two Year M. Tech II Semester Regular Examinations September - 2012
### (Regulations: VCE-R11)
RELIABILITY ENGINEERING
(Power Electronics and Electric Drives)

Time: 3 hours **Max Marks: 60**

Answer any FIVE Questions. All Questions carry equal marks
All parts of the questions must be answered in one place only

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1 a) Write down the properties of Binomial distribution   6m
   b) A die is thrown 6 times. Evaluate individual and cumulative probabilities of various possible events if getting of Two is treated is success in each trail. Hence find the probability of getting two at least once and probability of two not getting.

2 a) Derive the relationship between f(t), F(t), h(t), R(t).   6M
   b) Consider a system consisting of 6 identical units of each having a failure rate of 0.2   6M
       failures per year.
       i.   Evaluate the probability of success of the system if it is fully redundant configuration for a period of 1000 hours.
       ii. Evaluate the probability of system surviving at least 4 out of 6 units must be success for a period of 1000 hours. Assume the exponential distribution with constant hazard rate function for the probability of components.

3 a) Write short notes on Bath Tub curve   6M
   b) Consider a system comprising of 4 identical units with having the failure rate of 0.1   6M
       f/yr. Evaluate the probability of the system surviving '5' years, if at least 2 units must operate successfully.

4 a) A parallel system has identical components having a reliability of 0.5. What is the   6M
       minimum number of components if the system reliability must be at least 0.99?
   b) A system consists of 4 components is parallel system requires that at least 3 out of 4 6M
       must functions.
       i) What is the system reliability if each component has a reliability of 0.9 and
       ii) What is the system reliability if 5 components are there to perform the same functions?

5 Consider the system shown in the figure below is which success requires that at least one of 12M
   the path AC, BD, AED, BEC is good. Evaluate a general expression for system success and the
   reliability of the system if each component has reliability of 0.99.

6
12M

1/2

3/4
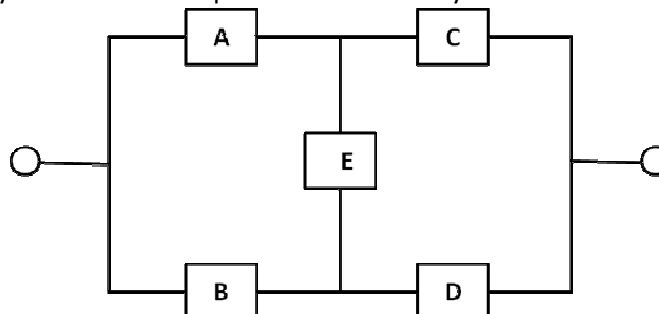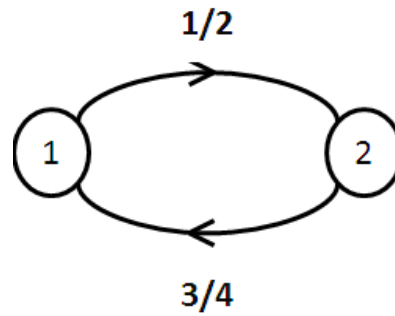
In one component repairable model with stats space diagram and the corresponding rates of transition are shown. If stats 2 is an absorbing stats evaluate the expected number of intervals the system can resides in other state. And also derive the formula used.

7 Evaluate the limiting state probabilities using STPM approach for the given example   12M

λdt

μdt
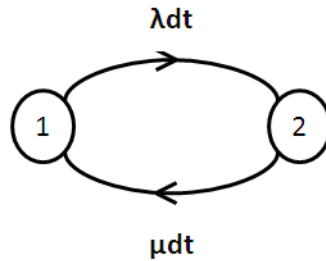
8 The failure rates of three components are 0.05 f/yr, 0.01 f/yr and 0.02 f/yr respectively.   12M
And their average repair times are 20 hours, 15 hours and 25 hours respectively. Evaluate the system failure rate, average repair time and unavailability if all the three components must operate for system success. And derive the formulas used.

VARDHAMAN COLLEGE OF ENGINEERING
(AUTONOMOUS)
Two Year M. Tech II Semester Regular Examinations September - 2012
(Regulations: VCE-R11)
SOFTWARE QUALITY ASSURANCE AND TESTING
(Software Engineering)

Time: 3 hours   **Max Marks: 60**

Answer any FIVE Questions. All Questions carry equal marks
All parts of the questions must be answered in one place only

1	a)	Define the Software Quality Assurance. Give some of basis for Software Quality.	8M
	b)	Explain the software process with respect to Software Quality Assurance.	4M
2	a)	Discuss in detail the software configuration management	8M
	b)	Write a short notes on reviews and audits	4M
3	a)	What are various Software Quality metrics? Explain?	6M
	b)	Explain with example the software complexity metrics.	6M
4	a)	What is structured engineering. Explain with an example.	6M
	b)	Discuss the methodology which improves the software quality.	6M
5	a)	Who are different members in critical groups in the testing process?	8M
	b)	Write short notes on errors faults and failures.	4M
6	a)	Write a short notes on origins of defects.	6M
	b)	Explain the defect classes and the defect repository.	6M
7	a)	Explain with help of an example between white box and black box testing strategies.	8M
	b)	What are different contents under which white box and black box testing techniques to evaluate a COTS component.	4M
8	a)	Explain in detail the test adequacy criterion hierarchy and its criteria (Axioms)	8M
	b)	Write short notes on covering code logic paths.	4M

VARDHAMAN COLLEGE OF ENGINEERING
(AUTONOMOUS)
Two Year M. Tech II Semester Regular Examinations September - 2012
(Regulations: VCE-R11)
SOFTWARE ARCHITECTURE AND DESIGN PATTERNS
(Software Engineering)

Time: 3 hours   **Max Marks: 60**

Answer any FIVE Questions. All Questions carry equal marks
All parts of the questions must be answered in one place only

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1. a) What is software architecture? Explain.   6M
   b) Explain the Architectural patterns, Reference models, and Reference Architectures.   6M

2. Draw the process flow diagram for the Cost Benefit Analysis Model (CBAM) and discuss the case study of NASA ECS project.   12M

3. Explain the product lines architecture and discuss the reasons that makes software product lines difficult   12M

4. Discuss the motivation, applicability, participants, collaborations, consequences, implementation and known uses of Builder and Singleton patterns   12M

5. Draw the structure and also discuss the motivation, applicability, participants, collaborations, consequences, and implementation of bridge and composite patterns.   12M

6. Discuss the motivation, applicability, participants, collaborations, consequences, implementation, known uses and related patterns of interpreter and iterator patterns.   12M

7. Draw the structure and also discuss the motivation, applicability, participants, collaborations, consequences, and implementation of observer and state patterns.   12M

8. Describe the three views of Celsius Tech architecture case study.   12M

VARDHAMAN COLLEGE OF ENGINEERING
(AUTONOMOUS)
Two Year M. Tech II Semester Regular Examinations September - 2012
(Regulations: VCE-R11)
WIRELESS COMMUNICATIONS AND NETWORKS
(Common to Digital Electronics and Communication Systems and Wireless and Mobile Communications)

Time: 3 hours　　　　　　　　　　　　　　　　　　　　　　　　　　　　Max Marks: 60

Answer any FIVE Questions. All Questions carry equal marks
All parts of the questions must be answered in one place only

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1　a)　A spectrum of 30MHz is allocated to a wireless FDD cellular system which uses two　　4M
　　　　25KHz simplex channels to provide full duplex voice and control channels, compute the
　　　　number of channels available per cell if a system uses
　　　　　　i.　Five-cell reuse
　　　　　　ii.　Seven-cell reuse
　　　　　　iii.　10-cell reuse
　　b)　Discuss Hand off strategies in detail　　8M

2　a)　Give a note on several variations of the CSMA strategy.　　6M
　　b)　In IS-95 CDMA system, if W=1.25MHz, R=9600bps and N=14 users　　6M
　　　　　　i.　Calculate E_b/N_o
　　　　　　ii.　When no voice activity is there, calculate E_b/N_o for omnidirectinal antennas
　　　　　　iii.　If voice activity = 3/8 and three sector antennas are used, calculate the total
　　　　　　　　number of users per cell.

3　　Give a detailed note in traffic routing in wireless networks　　12M

4　a)　Describe the two data-only mobile services developed to provide packet radio　　8M
　　　　connectivity throughout a network.
　　b)　What is common channel signaling? What are the advantages of common channel　　4M
　　　　signaling over conventional signaling?

5　a)　Give the format for mobile IP agent advertisement message and describe each field in　　8M
　　　　detail.
　　b)　What is WTP? What are the transaction classes provided by WTP that may be invoked　　4M
　　　　by WSP or another higher-layer protocol.

6　a)　List and briefly describe the three categories of wireless LAN products　　6M
　　b)　Give the format of IEEE 802.11 MAC frame and explain each field.　　6M

7　a)　Explain the three error correction schemes used by Bluetooth at the baseband level.　　6M
　　b)　List and describe the three types of logical channels provided by L2CAP.　　6M

8　a)　Explain in detail the three categories of mobile data networks　　6M
　　b)　Draw and explain the packet transfer on the uplink and downlink in GPRS.　　6M

VARDHAMAN COLLEGE OF ENGINEERING
(AUTONOMOUS)
Two Year M. Tech II Semester Regular Examinations September - 2012
(Regulations: VCE-R11)
LOW POWER CMOS VLSI DESIGN
(Digital Electronics and Communication Systems)

Time: 3 hours **Max Marks: 60**

Answer any FIVE Questions. All Questions carry equal marks
All parts of the questions must be answered in one place only

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1	a)	Explain different sources of power dissipation in digital CMOS circuit	6M
	b)	Explain	6M
		i. Sub threshold Swing	
		ii. Effects of short channel length	

2 a) If $y = \overline{x_1} x_2 x_3 + x_1 \overline{x_2} x_3 + x_1 x_2 \overline{x_3}$, Determine a(y). 8M

  b) Express $P(x_{2T} x_T x_0), P(x_{2T} \overline{x_T} x_0) and P(x_{2T} x_0)$ in terms of probabilities $P(P_x)$ and normalized activities $a(a_x)$. 4M

3 Explain 12M
  i. Average power estimation in combinational circuits
  ii. Average power estimation in sequential circuits.

4	a)	Explain the algorithmic level transforms for low power	6M
	b)	With appropriate example, explain the drawback of power reduction using parallelism.	6M

5 Explain 12M
  i. Technology mapping
  ii. Transistor sizing

6 Draw and explain the operation of 4T SRAM cell and 6T SRAM cell 12M

7	a)	Explain different precharge techniques employed by SRAM's	6M
	b)	With a neat diagram, explain the operation of differential sense amplifier.	6M

8 Explain 12M
  i. Instruction level power analysis
  ii. Voltage island

VARDHAMAN COLLEGE OF ENGINEERING
(AUTONOMOUS)
Two Year M. Tech II Semester Regular Examinations September - 2012
(Regulations: VCE-R11)
ALGORITHMS FOR VLSI DESIGN AUTOMATION
(Digital Electronics and Communication Systems)

Time: 3 hours   Max Marks: 60

Answer any FIVE Questions. All Questions carry equal marks
All parts of the questions must be answered in one place only

1	a)	Discuss different stages involved in physical design cycle.	8M
	b)	Compare different design styles based on performance and area	4M
2	a)	Distinguish between Depth-First search and Breadth-First search methods.	6M
	b)	With an example, explain shortest path algorithms are used in physical design	6M
3	a)	Give the classification of partitioning algorithms	6M
	b)	Explain Simulated Annealing algorithms for optimization of circuit partitioning.	6M
4	a)	Give the classification of Floor planning algorithm.	6M
	b)	Discuss Pin assignment problems in different design styles.	6M
5	a)	Explain problems associated during placement in physical design process.	6M
	b)	Discuss any one of the partition based placement algorithm.	6M
6	a)	Discuss the different phases in global routing.	8M
	b)	Explain problems associated during routing in gate array design process.	4M
7	a)	What are the parameters associated with the routing problems and explain.	6M
	b)	Explain channel routing problems	6M
8	Write short not on		12M
	i.	Greedy channel router	
	ii.	Hybrid HVH-VHV router	

VARDHAMAN COLLEGE OF ENGINEERING
(AUTONOMOUS)
Two Year M. Tech II Semester Regular Examinations September - 2012
(Regulations: VCE-R11)
NETWORK SECURITY AND CRYPTOGRAPHY
(Common to Digital Electronics and Communication Systems, Wireless and Mobile Communications)

Time: 3 hours   **Max Marks: 60**

Answer any FIVE Questions. All Questions carry equal marks
All parts of the questions must be answered in one place only

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1	a)	Describe the relationship between security services and mechanisms.	6M
	b)	What are the different types of attacks? Explain with examples	6M
2	a)	What is double DES? What kind of attack is possible on double DES?	6M
	b)	Explain AES encryption round with a neat diagram	6M
3	a)	Perform encryption/decryption using RSA algorithm for the following: p = 3, q = 11, e = 7, m = 5	8M
	b)	Explain digital signature standard algorithm for authentication	4M
4	a)	Describe the different cryptographic functions provided by PGP.	6M
	b)	What is MIME? What are the different content types of MIME?	6M
5		Explain in detail the architecture of IPSec.	12M
6	a)	How web security can be achieved? What are the different mechanisms?	6M
	b)	Explain the operation of SSL Record protocol with a neat diagram.	6M
7		Explain the architecture of SNMP in detail	12M
8	a)	Define the three classes of intruders and mention the intrusion techniques to protect from the intruders.	6M
	b)	Explain the different types of viruses.	6M

VARDHAMAN COLLEGE OF ENGINEERING
(AUTONOMOUS)
Two Year M. Tech II Semester Regular Examinations September - 2012
(Regulations: VCE-R11)
POWER ELECTRONIC CONTROL OF AC DRIVES
(Power Electronics and Electric Drives)

Time: 3 hours   **Max Marks: 60**

Answer any FIVE Questions. All Questions carry equal marks
All parts of the questions must be answered in one place only

1	Explain the operation of three-phase star-connected squirrel cage induction motor when fed from a three phase A.C. controllers for its starting and speed control purpose. Give neat circuit diagram, necessary waveforms and speed-torque characteristics.	12M
2	a) Discuss in detail the current fed inverter control of induction motor drive.	6M
	b) Explain how speed and flux control in current fed inverter drive can be achieved by Volts / Hertz control.	6M
3	Explain in detail different modes of operation of static scberibus drive.	12M
4	Discuss in detail the following vector control methods of induction motor drive:	
	a) Adaptive Control	6M
	b) Self tuning regulator model reference control	6M
5	Explain in detail about operation of synchronous motor with neat diagram and also explain its characteristics.	12M
6	Explain the designing and operation of maximum permissible torque speed control scheme with its implementation strategy	12M
7	Explain in detail torque production and operation of variable reluctance motor drive	12M
8	Explain the operation and characteristics of current controlled brushless DC servo drives.	12M

VARDHAMAN COLLEGE OF ENGINEERING
(AUTONOMOUS)
Two Year M. Tech II Semester Regular Examinations September - 2012
(Regulations: VCE-R11)
CODING THEORY AND TECHNIQUES
(Digital Electronics and Communication Systems)

Time: 3 hours   **Max Marks: 60**

Answer any FIVE Questions. All Questions carry equal marks
All parts of the questions must be answered in one place only

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1. a) Consider a channel with two inputs x_1, x_2 and three outputs y_1, y_2, y_3 and the noise matrix of the channel is given below. Calculate I(X, Y), with $p(x_1)=p(x_2)=0.5$ 6M

$$P(Y/X)= \begin{array}{c|ccc} & y_1 & y_2 & y_3 \\ \hline x_1 & 3/4 & 1/4 & 0 \\ x_2 & 0 & 1/2 & 1/2 \end{array}$$

   b) Show that the minimum Hamming distance of a linear block code is equal to the minimum number of columns of its parity check matrix that are linearly dependent show also that the minimum Hamming distance of a Hamming code is always equal to 3.   6M

2. a) Explain about encoders and decoders of cyclic codes with an example.   6M
   b) For the (7, 4) single error correcting cyclic code   6M

   $m(x) = m_0 + m_1 X + m_2 X^2 + m_3 X^3$ and

   $x^7 + 1 = (1 + X + X^3)(1 + X + X^2 + X^4)$ draw the encoder and find the code words.

3. Let $g(p) = P^8 + P^6 + P^4 + P^2 + 1$ be a polynomial over the binary field
   a) Find the lowest rate cyclic code whose generator polynomial is g(p). What is the rate of this code?   4M
   b) Find the minimum distance of the code found in (a).   4M
   c) What is the coding gain for the code found in (a)?   4M

4. A convolutional code is described by g_1=[I 0 I], g_2=[I I I] and g_3=[I I I]
   a) Draw the encoder corresponding to this code   4M
   b) Draw the state transition diagram for this code   4M
   c) Draw the trellis diagram for this code   4M

5. A rate 1/3, K = 6 convolutional code is given by the generator polynomials.

   $g(1,1) = 1 + X^2 + X^3 + X^5$

   $g(1,2) = 1 + X + X^4 + X^5$

   a) Write g(1) and the matrices $[G_\alpha]$ and $[H_\alpha]$.   4M
   b) Determine H.D and t for the code   4M
   c) Draw a possible decoder for the code, after checking if the code is majority logic decodable.   4M

6. a) Consider the binary fire code for b=3, (x, k) = (35, 27) obtain the generator polynomial g(x) and design the coder / decoder circuits.   8M
   b) Interleave the code with $\lambda = 4$ and obtain the new g(X). Estimate the values of b and g for the new code   4M

7. Construct GF(2^3) from GF(2) by using the third degree irreducible polynomial   12M

   $p(x) = x^3 + x^2 + 1$

8. Consider (31,21), $t \leq 2$ and (31, 16), $t \leq 3$ BCH codes. Write the parity check matrices for the codes, and check if the codes are majority logic decodable. Find the syndrome bits in terms of error bits.   12M

VARDHAMAN COLLEGE OF ENGINEERING
(AUTONOMOUS)
Two Year M. Tech II Semester Regular Examinations September - 2012
(Regulations: VCE-R11)
OPTICAL NETWORKS
(Common to Digital Electronics and Communication Systems, Wireless and Mobile Communications)

Time: 3 hours   **Max Marks: 60**

Answer any FIVE Questions. All Questions carry equal marks
All parts of the questions must be answered in one place only

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1	a)	Discuss the SONET frame structures	6M
	b)	Explain the following functions of ATM	6M
		i. Connections and cell forwarding	
		ii. Signaling and Routing	
2	a)	Discuss different OADM architectures with neat figures.	6M
	b)	Draw the block diagram of broadcast and select ROADM and explain its functioning.	6M
3	a)	Discuss cost tradeoffs by considering a PWDM ring architecture.	6M
	b)	Explain light path topology design (LTD) problem in brief.	6M
4	a)	Mention the key attributes of optical layer (light path) service.	6M
	b)	Explain adaptation management in WDM optical networks with neat diagrams	6M
5	a)	Explain unidirectional path switched rings used in the protection of SONET / SDH	6M
	b)	Discuss the protection in IP with an example.	6M
6	a)	Draw the block diagram of wavelength routing PON (WRPON) and explain its working	6M
	b)	Explain the functions of each element of an access network with a neat architectural diagram	6M
7	a)	Explain optical time division multiplexing (OTDM) with a neat figure.	6M
	b)	Explain the following:	6M
		i. Recirculation Buffering	
		ii. Burst Switching	
8	a)	Discuss architectural choices for next generation transport networks with neat diagrams.	6M
	b)	Explain how the transmission capacity of an optical link is increased by SDM.	6M

VARDHAMAN COLLEGE OF ENGINEERING
(AUTONOMOUS)
Two Year M. Tech II Semester Regular Examinations September - 2012
(Regulations: VCE-R11)
DATABASE MANAGEMENT SYSTEMS
(Computer Science and Engineering)

Time: 3 hours   **Max Marks: 60**

Answer any FIVE Questions. All Questions carry equal marks
All parts of the questions must be answered in one place only

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1	a)	What are database utilities? List a few common functions that the utilities perform.	3M
	b)	What is meant by a recursive relationship type? Give some examples of recursive relationship types.	3M
	c)	Consider a bank database taking care of accounts (saving, current, fixed deposit, flexi,….) and loans (house, auto, business,….). Suppose it is necessary to keep track of each account transaction (deposit, withdrawal, checks, ATMs,…) and loan payment. All transactions must include the amount, date, and time. Draw the bank schema and EER diagram. State any assumptions you make about additional requirements.	6M
2	a)	Discuss the purpose of Boyce-Codd normal form and describe how BCNF differs from and is stronger than 3NF. Illustrate your answer with an example.	4M
	b)	below are two sets of FDs for a relation R (A, B, C, D, E). Are they equivalent? i. A→B, AB→C, D→AC, D→E ii. A→BC, D→AE	5M
	c)	What types of constraints are inclusion dependencies meant to represent?	3M
3	a)	Discuss the entity integrity and referential integrity constraints. Why is each considered important?	4M

	b)	For relations Employee(name, ssn, sex, salary, superssn, dno); Manager(mgrssn, mgr joindt); deptloc(dno, dloc); proj(pno, pname, ploc, dno); works(ssn, pno, hrs); dept(dname, dno, mrgssn); dependent(essn, deptname, sex, relationship).
		Write querries for the shema of figure in relational algebra.
		  i). Retrieve the names of all employees in department 5 who work more than 10 hours per week on the product X project.
		  ii). For each project, list the project name and the total hours per week (by all employees) spent on that project.
		  iii). Retrieve the names of all employees who do not work on any project.
		  iv). For each department, retrieve the department name and the average salary of all employees working in that department.
			8M

4	a)	What is the need of PL/SQL ? Explain.	3M
	b)	What is the need of cursor? Write cursor routine for The HRD manager has decided to raise the salary of employees by 015. Write a PL/SQL block to accept the employee number and update the salary of that employee. Display appropriate message based on the existence of the record in the employee table.	5M
	c)	Discuss the advantages of functions / procedures.	4M
5	a)	A PARTS file with Part# as hash key includes records with the following Part# values: 2369, 3760, 4692, 4871, 5659, 1821, 1074, 7115, 1620, 2428, 3943, 4750, 6975, 4981, 9208. The file uses eight buckets, numbered 0 to 7. Each bucket is one disk block and holds two records. Load these records into the file in the given order, using the hash function h(K)=K mod 8. Calculate the average number of block accesses for a random retrieval on Part#.	5M
	b)	Discuss the different conditions of modification of a B-tree and a B+-tree when an element is deleted.	4M
	c)	Discuss the sort-merge algorithm and illustrate its working with an example.	3M

6 a) What is meant by the concurrent execution of database transactions in a multiuser system? Discuss why concurrency control is needed, and give informal examples.   4M

   b) What is lock? Describe the types of locks used in concurrency control?   4M

   c) List the actions taken by the recovery manager during check pointing.   4M

7 a) Explain the architecture of distributed databases.   4M

   b) Consider the following global, fragmentation, and allocation schemata: 4M

   Global schema: STUDENT(NUMBER, NAME, DEPT)

   Fragmentation schema: $STUDENT_1 = SL_{DEPT = "EE"} STUDENT$

   $STUDENT_2 = SL_{DEPT = "CS"} STUDENT$

   Allocation schema : $STUDENT_1$ at sites 1, 2

   $STUDENT_2$ at sites 3, 4

   (Assume that "EE" and "CS" are the only possible values for DEPT).

   i). Write an application that requires the student number from the terminal and outputs the name and department, at levels 1, 2 and 3 of transparency.

   ii). Write an application that moves the student having number 232 from department "EE" to department "CS", at levels 1, 2 and 3 of transparency.

   c) Briefly Explain the steps involved in transforming global queries into fragment queries.   4M

8 a) What is the difference between structured and unstructured complex objects?   3M

   b) How do spatial databases differ from regular databases? Discuss the different categories of spatial queries.   3M

   c) Explain the tags used in HTML giving examples.   3M

   d) Briefly explain applications of multimedia databases.   3M

VARDHAMAN COLLEGE OF ENGINEERING
(AUTONOMOUS)
Two Year M. Tech II Semester Regular Examinations September - 2012
(Regulations: VCE-R11)
POWER ELECTRONIC CONVERTERS - II
(Power Electronics and Electric Drives)

Time: 3 hours   **Max Marks: 60**

Answer any FIVE Questions. All Questions carry equal marks
All parts of the questions must be answered in one place only

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1	a)	What is an IGBT? Draw the output characteristics of IGBTs?	6M
	b)	What is an SIT? Draw and explain the various characteristics of SITS.	6M
2	a)	Explain the purpose of coupled inductors in half-bridge-resonant inverters?	6M
	b)	What are the advantages of reverse-conducting thyristors in resonant inverters?	6M
3	a)	What are the effects of both series and parallel loading in a series-resonant inverter?	6M
	b)	Describe the methods for voltage control of series-resonant inverters?	6M
4	a)	What is the principle of Zero-Current-Switching(ZCS) resonant converters?	6M
	b)	What are the advantages and limitations of ZVS converters?	6M
5	a)	Briefly explain the different types of multilevel inverters.	6M
	b)	Explain the principle of operation of flying-capacitors multilevel inverter?	6M
6	a)	Describe back-to-back intertie system?	6M
	b)	What are the applications of multilevel inverters?	6M
7	a)	Describe the normal specifications of power supplies.	6M
	b)	Enumerate the advantages and disadvantages of flyback converters.	6M
8	a)	Describe briefly the various types of power supplies in general.	6M
	b)	What are the advantages and disadvantages of bidirectional power supplies?	6M

VARDHAMAN COLLEGE OF ENGINEERING
(AUTONOMOUS)
Two Year M. Tech II Semester Regular Examinations September - 2012
(Regulations: VCE-R11)
FLEXIBLE AC TRANSMISSION SYSTEMS
(Power Electronics and Electric Drives)

Time: 3 hours   **Max Marks: 60**

Answer any FIVE Questions. All Questions carry equal marks
All parts of the questions must be answered in one place only

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1 a) Why do we need Transmission inter connections?   6M
   b) What are the limitations on loading capability of transmission assets?   6M

2 With a neat circuit diagram explain the operation of single phase full wave voltage source   12M
   converter and draw the relevant wave forms for ac voltage, ac current.

3 State the advantages and disadvantages of current source converters over voltage source   12M
   converters.

4 With neat diagrams explain the variations of voltage stability limit of a radial line with load 12M
   and load power factor and explain how do you extend the limit by reactive shunt
   compensation.

5 With a block diagram explain the functional control scheme for the TSC-TCR type static var   12M
   generator

6 Draw the block diagram of the basic static var compensator and derive an expression for   12M
   the variation of amplitude variation of the terminal voltage against amplitude variation of
   power system voltage.

7 Compare the STATCOM and SVC taking atleast six points into account   12M

8 With a neat circuit diagram describe a basic Thyristor Switched Series Capacitor scheme and   12M
   explain the operation.

VARDHAMAN COLLEGE OF ENGINEERING
(AUTONOMOUS)
Two Year M. Tech II Semester Regular Examinations September - 2012
(Regulations: VCE-R11)
PROGRAMMABLE LOGIC CONTROLLERS AND APPLICATIONS
(Power Electronics and Electric Drives)

Time: 3 hours   **Max Marks: 60**

Answer any FIVE Questions. All Questions carry equal marks
All parts of the questions must be answered in one place only

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1	a)	Explain role and operation of I/o modules in a PLC system.	6M
	b)	Explain the proper construction of PLC ladder diagrams	6M
2	a)	Explain the basic input instruction of a PLC	6M
	b)	Explain the procedural steps involved in Drill press operation. Draw the Ladder diagram for drill press control	6M
3	a)	Explain the following i) AND gate and relay and PLC equivalents ii) NOR gate and relay and PLC equivalents	6M
	b)	Discuss about Ladder diagrams and sequence listings.	6M
4	a)	What are the characteristics of PLC registers	6M
	b)	Discuss about the following i) Input registers ii) Addressing format of Allen Bradley PLC	6M
5	a)	Explain the master control relay with an application	6M
	b)	Describe a process requiring nesting of two subroutines	6M
6	a)	Explain the operation of SKIP function layout and write a MCR function PLC operation layout	6M
	b)	What is the purpose of JUMP function? What are the advantages of JUMP Instruction?	6M
7	a)	Explain the process of controlling a basic two axis Robot with a PLC sequencer	6M
	b)	What are the advantages of matrix functions?	6M
8		Write short notes on i) ONS and CLR function ii) PLC analog modules iii) PLD modules	12M

VARDHAMAN COLLEGE OF ENGINEERING
(AUTONOMOUS)
Two Year M. Tech II Semester Regular Examinations September-2012
(Regulations: VCE-R11)
SEMANTIC WEB AND SOCIAL NETWORKING
(Software Engineering)

Time: 3 hours   **Max Marks: 60**

Answer any FIVE Questions. All Questions carry equal marks
All parts of the questions must be answered in one place only

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1 a. What is Moore's law and give the motivation for Semantic web?   6M
   b. Explain how logic for complex business calculations is currently carried out through   6M
       .NET and J2EE applications servers.

2 a. Explain the difference between Higher order Logic (HOL) with first order logic (FOL)   6M
   b. Explain in detail about   6M
       i) Software agents   ii) Ontology

3 a. Explain the following in detail?   6M
       i) Resource description frame work (RDF) and Resource description frame work schema
       ii) Ontology web language (OWL)
   b. Discuss how the number of nodes on the Web creates computational complexity that   6M
       limits the ability to develop logic proof systems.

4 Discuss the iterative approach for building Ontologies according to the process of Noy and   12M
   Meguiness.

5 a. How the semantic web services are different from other web services? Explain with an   6M
       example.
   b. List three potential applications that would benefit from the Semantic Web   6M
       environment.

6 a. Explain Semantic search Technologies?   6M
   b. Define web search agents and semantic methods.   6M

7 a. Discuss the Limitations of current web   6M
   b. What are the emerges took place in social web   6M

8 Explain the procedure to build the semantic web applications with Social Network feature.   12M

VARDHAMAN COLLEGE OF ENGINEERING
(AUTONOMOUS)
Two Year M. Tech II Semester Regular Examinations September - 2012
(Regulations: VCE-R11)
SERVICE ORIENTED ARCHITECTURE
(Software Engineering)

Time: 3 hours   **Max Marks: 60**

Answer any FIVE Questions. All Questions carry equal marks
All parts of the questions must be answered in one place only

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1   Explain different components in activity management of Service Oriented Architecture?   12M

2   Illustrate the usage of notification and event services in contemporary SOA with suitable examples?   12M

3   Explain the different phases in SOA delivery life cycle with the help of a neat diagram?   12M

4   What is service oriented analysis? List the benefits of a business centric Service Oriented Architecture?   12M

5   What is basic idea behind service oriented design? Explain different service interface design tools?   12M

6   Explain the task centric business services and utility services in Service Oriented Architecture?   12M

7   What is Web service Coordination? How it is helpful in building effective Service Oriented Architecture? Discuss its various features.   12M

8   Explain the principle behind WS policy language and metadata exchange language basics?   12M

VARDHAMAN COLLEGE OF ENGINEERING
(AUTONOMOUS)
Two Year M. Tech II Semester Regular Examinations September - 2012
(Regulations: VCE-R11)
AD HOC WIRELESS AND SENSOR NETWORKS
(Wireless and Mobile Communications)

Time: 3 hours   **Max Marks: 60**

Answer any FIVE Questions. All Questions carry equal marks
All parts of the questions must be answered in one place only

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1 a) What issues make sensor networks a distinct category of ad hoc wireless networks?   6M
       Explain.
   b) Draw the schematic diagram of the ad hoc wireless internet. Mention some of the   6M
       applications of the ad hoc wireless internet. Why QOS support provision in the ad hoc
       wireless internet is an important issue to be considered?

2 a) What are the main issues that need to be addressed while designing a MAC protocol   8M
       for ad hoc wireless networks?
   b) Give the classification of random access protocols.   4M

3 a) Classify the ad hoc wireless network routing protocols based on the routing   3M
       information update mechanism
   b) Discuss the on-demand protocol designed to restrict the bandwidth consumed by   9M
       control packets in ad hoc wireless networks. Also mention its advantages and
       disadvantages.

4 a) Enumerate on the two types of multicast protocols for ad hoc wireless networks based 6M
       on the type of operation.
   b) Explain in detail Weight-Based multicast protocol.   6M

5 a) What are the major reasons behind throughput degradation faced by TCP when used   6M
       in ad hoc wireless networks?
   b) Mention the targeted layer in the protocol stack for the following attacks.   6M
       i.   Jamming
       ii.   Byzantine attack
       iii. Routing attacks
       iv.   Repudiation
       v.   Wormhole attack
       vi.   Impersonation

6 Explain in detail the existing network layer solutions that support QOS provisioning.   12M

7 a) Describe the data link layer solutions to calculate the optimum transmission range.   8M
   b) List and explain the factors on which the optimal value of the reception range depend. 4M

8 a) Explain Romor routing algorithm.   4M
   b) Explain some simple multi-lateration techniques.   6M
   c) Why clustered architecture is specially useful for sensor networks.   2M

VARDHAMAN COLLEGE OF ENGINEERING
(AUTONOMOUS)
Two Year M. Tech II Semester Regular Examinations September - 2012
(Regulations: VCE-R11)
SPREAD SPECTRUM COMMUNICATIONS
(Wireless and Mobile Communications)

Time: 3 hours   **Max Marks: 60**

Answer any FIVE Questions. All Questions carry equal marks
All parts of the questions must be answered in one place only

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1	a)	Write a short note on importance of Spread Spectrum System.	4M
	b)	Compare process gains available for various techniques including signal rejection and cancellation	3M
	c)	Discuss the overall direct sequence system with waveforms.	5M
2	a)	Draw the three stage liner code generator diagrams and explain briefly.	6M
	b)	What code sequences could be produced by a $[7, 2]_s$ generator?	6M
3	a)	Explain about add-and-divide frequency synthesizer. Draw a block diagram to produce 8000 frequency separated by 100 Hz spacing.	6M
	b)	Determine the mean and base frequencies for a direct, 64 frequency add-and-divide synthesizer with o/p at 70MHz and 10KHz o/p spacing.	6M
4	a)	Compare phase lock and Costas receivers for subcarrier FM or FSK demodulation.	6M
	b)	Write the short note on integrate-and-dump filters.	6M
5	a)	Write the concept of Tracking and explain Delay-Lock-Tracking.	6M
	b)	A delay-line matched filter is to be constructed to match a 1023 code sequence. The code rate is 5 MCPs. What is the major delay characteristics required?	6M
6	a)	Explain about the correlation receiver with AGC loop	6M

	b)	Write the short notes on
		   i. LOS loss and
		   ii. Absorptive losses
			6M

7	a)	Discuss the direct sequence ranging system.	6M
	b)	What is range error? Give the classification and explain briefly.	6M
8	a)	Write short notes about the Jamming Margin Test setup in analog and digital information system.	6M
	b)	What is sensitivity? Discuss the spread spectrum receiver sensitivity test setup.	6M

VARDHAMAN COLLEGE OF ENGINEERING
(AUTONOMOUS)
Two Year M. Tech II Semester Regular Examinations September - 2012
(Regulations: VCE-R11)
OBJECT ORIENTED ANALYSIS AND DESIGN
(Computer Science and Engineering)

Time: 3 hours   **Max Marks: 60**

Answer any FIVE Questions. All Questions carry equal marks
All parts of the questions must be answered in one place only

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1   a)   Explain briefly runtime polymorphism illustrating a program in Java or C++   4M
    b)   What are the principles of modeling?   4M
    c)   Explain the anti symmetric and transitive properties of aggregation.   4M

2   a)   Why is it necessary to have a variety of diagrams in a model of a system?   4M
    b)   Define the following: 8M
         i.   Use case driven
         ii.   Architecture centric
         iii.   Incremental process
         iv.   Artifact

3   a)   What are interaction diagrams? What are their contents and common properties? Define semantic equivalence between two kinds of interaction diagrams.   8M
    b)   Enumerate the steps to model flows of control by time ordering.   4M

4   a)   Consider a retail system that interacts with customers who place and track orders. In turn, the system will ship orders and bill the customers. Model the behavior of the system will ship orders and bill the customers. Model the behavior of the system by declaring the behaviors as use cases.   6M
    b)   What are the contents, common properties and common uses of use case diagrams?   6M

5   a)   Define component. What are the differences between components and classes? How are component and interface related?   6M
    b)   Enumerate the steps to model an executable release. Illustrate with a UML diagram.   6M

6   a)   How does the emphasis in the four teams evolve over the course of the entire project?   6M
    b)   Briefly explain the Generic iteration workflow.   6M

7   a)   Discuss the activities in the Inception phase.   6M
    b)   List various requirements to test the elaboration phase. Explain.   6M

8   a)   Draw a use case diagram to model the behavior of a cellular phone. Explain briefly.   6M
    b)   Discuss the activities of construction phase.   6M

VARDHAMAN COLLEGE OF ENGINEERING
(AUTONOMOUS)
Two Year M. Tech II Semester Regular Examinations September - 2012
(Regulations: VCE-R11)
MODERN CONTROL ENGINEERING
(Power Electronics and Electric Drives)

Time: 3 hours   **Max Marks: 60**

Answer any FIVE Questions. All Questions carry equal marks
All parts of the questions must be answered in one place only

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1 Find the Eigen values and Eigen vectors for the following matrix   12M

$$A = \begin{bmatrix} -4 & 1 & 0 \\ 0 & -3 & 1 \\ 0 & 0 & -2 \end{bmatrix}$$

2 Obtain the inverse z-transform of the following: 12M

i) $x(z) = \dfrac{10}{(z-1)(z-2)}$ ii) $x(z) = \dfrac{z(z+2)}{(z-1)^2}$

3 a) Define State and State variables.   4M
   b) Consider the system represented by differential equation   8M

$$\frac{d^3 y}{dt^3} + 6\frac{d^2 y}{dt^2} + 11\frac{dy}{dt} + 6y = 6u$$

   Where y is output and u is input obtain state space representation of the system.

4 a) Write the properties of state transition matrix.   4M
   b) Find state transition matrix for the following system   8M

$$\begin{bmatrix} \dot{x}_1 \\ \dot{x}_2 \end{bmatrix} = \begin{bmatrix} 0 & 1 \\ -2 & -3 \end{bmatrix}\begin{bmatrix} x_1 \\ x_2 \end{bmatrix}$$

5 a) Define controllability   4M
   b) Investigate controllability of following system   8M

$$x(K+1) = \begin{bmatrix} 1 & K \\ 0 & -1 \end{bmatrix} X(K) + \begin{bmatrix} 0 \\ 1 \end{bmatrix} u(K)$$

$$y(K) = \begin{bmatrix} 1 & 1 \end{bmatrix} X(K)$$

6 a) State and explain Lyapunou's stability theorem   6M
   b) Determine the stability of origin of the following system.   6M

$$\dot{x}_1 = x_2$$

$$\dot{x}_2 = -x_1^3 - x_2$$

7 Determine the stability of the following systems whose characteristic equation is   12M

i. $F(z) = z^2 - 0.25$ ii) $F(z) = z^3 - 3.3z^2 + 0.08z + 0.24 = 0$

8 A system is described by   12M

$$\dot{x} = \begin{bmatrix} -1 & 0 & 0 \\ 1 & -2 & 0 \\ 0 & 1 & -3 \end{bmatrix} x + \begin{bmatrix} 10 \\ 1 \\ 0 \end{bmatrix} u$$

Design a state feedback controller which will give closed loop poles at $-1 \pm j2, -6$