Code No: **R42021**

R10

Set No. 1

IV B.Tech II Semester Regular Examinations, April/May - 2014
DIGITAL CONTROL SYSTEMS
(Electrical and Electronics Engineering)

Time : 3 hours   **Max. Marks: 75**

Answer any Five Questions
All Questions carry equal marks
*****

1 a) Explain about the shifting and scaling operator.   [8]
   b) Discuss briefly about the linear time invariant and causal systems.   [7]

2 a) Write the mapping points between S-Plane and Z-plane.   [7]
   b) Find the z-transform of (i) unit step   (ii) $f(t)=t\,e^{-at}$ [8]

3 a) Explain about the weighted resistor 3 bit D/A converter?   [7]
   b) Explain any examples of data control systems?   [8]

4 a) What are the methods for computation of state transition matrix. Explain any [7]
       one method?
   b) A discrete time system is described by the differential equation $y(k+2)+$ [8]
       $5y(k+1)+6y(k)=4U(k)$ assuming initial conditions are
       y(0) = 1, y(1) = 0, T = 1 sec. Find the state transition matrix.

5 a) Explain the Duality between controllability and observability.   [7]
   b)   Consider that a digital control system is described by the state equation. [8]
       $x(k+1)=Ax(k)+Bu(k$
       Where
       $A = \begin{bmatrix} 1 & -2 & 0 \\ 3 & 2 & 1 \\ -1 & 1 & 4 \end{bmatrix}, B = \begin{bmatrix} 1 & 0 \\ -1 & 1 \\ 0 & 1 \end{bmatrix}$, Determine the controllability of the
       system.

6 a) Explain the following mapping between the S-Plane and the Z-Plane.   [12]
       (i) Primary strips and complementary Strips   (ii) Constant frequency loci
       (iii) Constant damping ratio loci
   b) Explain the stability conditions of closed loop systems in the Z over in the S- [3]
       plane.

7 a) Write the transient response specifications?   [7]
   b) Explain the design procedure in the w-plane?   [8]

8 a) Discuss the necessary conditions for design of state feedback controller [10]
       through pole placement?
   b) Explain about the state observers?   [5]

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IV B.Tech II Semester Regular Examinations, April/May - 2014
DIGITAL CONTROL SYSTEMS
(Electrical and Electronics Engineering)

Time : 3 hours   Max. Marks: 75

Answer any Five Questions
All Questions carry equal marks
*****

1   Explain in detail about the periodic and nonperiodic signals with a neat sketch?   [15]

2 a) Solve the following difference equation   [5]
       $y(k + 2) + 3y(k + 1) + 2y(k) = 0; y(-1) = -\frac{1}{2}, y(-2) = \frac{3}{4}$
   b) Obtain the z transform of $f(t) = e^{-at}$ [5]
   c) Find the inverse z-transform of $F(Z) = \frac{1}{Z(Z-0.2)}$ [5]

3 a) State and prove the sampling theorem?   [7]
   b) Derive transfer functions for the following data hold circuits.   [8]
       (i) Zero order hold circuit   (ii) First order hold circuit

4 a) Write the controllable and diagonal canonical forms?   [7]
   b) Consider a discrete linear data control system, whose input-output relation is   [8]
       described by the difference equation $y(k + 2) + 2y(k + 1) + y(k) = u(k)$
       initial conditions are $x(0) = 0 \ and \ x(1) = 1$. Test the state controllable and
       observable canonical forms?

5 a) Explain the concepts of controllability and observability.   [7]
   b) Investigate the controllability and observability of the digital system.   [8]
       $x(k + 1) = \begin{bmatrix} -1 & 1 \\ 0 & -1 \end{bmatrix} x(k) + \begin{bmatrix} 0 \\ 1 \end{bmatrix} u(k)$ and $y(k) = [1 \quad 1]x(k)$

6 a) List the difference between the Jury stability test and stability analysis using   [7]
       bilinear transformation coupled with routh stability criterion?
   b) Consider the discrete time unity feedback control system (T=1 sec) whose open   [8]
       loop pulse transfer function is given by
       $$G(z) = \frac{K(0.3679Z + 0.2642)}{(Z - 0.3679)(Z - 1)}$$
       Determine the range of K for stability by use of the Jury stability test.

7 a) Discuss about the response of a linear time invariant discrete time system to a   [7]
       sinusoidal input?
   b) Consider the system defined by $x(kT) = u(kT) + ax((k - 1)T), \ 0 < a < 1$ [8]
       Where u(kT) is the input and x(kT) the output. Obtain the steady state output
       x(kT), when the input u(kT) is the sampled sinusoidal.

8   Derive the necessary and sufficient conditions for design of state feedback   [15]
     controller through pole placement?

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Code No: **R42021**

R10

Set No. 3

IV B.Tech II Semester Regular Examinations, April/May - 2014
DIGITAL CONTROL SYSTEMS
(Electrical and Electronics Engineering)

Time : 3 hours   Max. Marks: 75
Answer any Five Questions
All Questions carry equal marks
*****

1   Discuss in detail about the continuous and discrete time signals with neat   [15]
       sketches?

2   a)   Obtain the Z-transform of the following   [8]
          (i) $x(t) = \frac{1}{a}(1 - e^{-at})$ (ii) $x(t) = t^2 e^{-at}$ where 'a' is constant

    b)   Consider $x(z)$ where $x(z) = \frac{2z^3 + z}{(z-2)^2(z-1)}$ obtain the inverse Z-transform of   [7]
          $x(z)$.

3   a)   What are the various types of analog to digital converters? Explain successive   [8]
          approximation type analog to digital converters with neat schematic diagram?

    b)   Describe the sample and hold operations?   [7]

4   a)   Write the state transition matrix and its properties?   [7]

    b)   Obtain the state transition matrix of the following discrete time system   [8]
          $x(k + 1) = Gx(k) + Hu(k)$
               $y(k) = Cx(k)$
          Where
          $G = \begin{bmatrix} 0 & 1 \\ -2 & -2 \end{bmatrix}, H = \begin{bmatrix} 1 \\ 1 \end{bmatrix}, C = [1 \quad 0]$

5   a)   Explain the test for controllability and observability.   [7]

    b)   Given the system   [8]
          x (k+1)=Ax (k)+Bu(k)
          y(k)=c x(k)
          Where $A = \begin{bmatrix} 0 & 1 \\ -1 & -3 \end{bmatrix}, B = \begin{bmatrix} 1 \\ 2 \end{bmatrix}, C = [1 \quad 1]$
          Determine the state controllability of the system.

6   a)   State and explain the jury stability test.   [8]

    b)   Using Jury's stability criterion find the range of K, for which the characteristic   [7]
          equation $z^3 + Kz^2 + 1.5Kz - (K + 1) = 0$ is closed loop stable.

7   a)   Explain the relation between the bilinear transformation and the w plane?   [7]

    b)   Discuss the review of phase lag, lead and lag-lead compensator?   [8]

8   a)   Explain the sufficient conditions for design of state feedback controller through   [7]
          pole placement?

    b)   Derive the ackerman's formula?   [8]

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Code No: **R42021**

R10

Set No. 4

IV B.Tech II Semester Regular Examinations, April/May - 2014
DIGITAL CONTROL SYSTEMS
(Electrical and Electronics Engineering)

Time : 3 hours   **Max. Marks: 75**

Answer any Five Questions
All Questions carry equal marks
*****

1 a) Explain about the discrete time signals with a neat sketch?   [8]
   b) Describe about the nonperiodic signals with a neat sketch?   [7]

2 a) State and prove the following Z-Transform theorems   [7]
       (i) Shifting theorem (left & right)   (ii) Initial value theorem
       (iii) Final value theorem
   b) Find the Z-transform of the following   [8]
       (i) $f(t) = e^{-at} \sin \omega t$ (ii) $f(s) = \frac{4}{s^2(s+2)}$

3 a) What are the advantages of sampling process in control systems?   [5]
   b) Explain any two types of digital to analog converters with a neat circuit?   [10]

4 a) What are the state space representation forms and explain them.   [8]
   b) Consider the following system.   [7]
 $$\frac{Y(z)}{U(Z)} = \frac{Z+1}{Z^2+1.3Z+0.4}$$
       Obtain the state space representation forms of controllable and observable
       canonical forms.

5 a) Derive the necessary condition for the digital control system   [7]
       X(K+1) = AX(K)+Bu(K)
       C(k) = DX(K) to be observable.
   b) Examine whether the discrete data system   [8]
       $$x(k + 1) = \begin{bmatrix} 0 & 1 \\ -2 & -2 \end{bmatrix} x(k) + \begin{bmatrix} 1 \\ -1 \end{bmatrix} u(k)$$
       $$y(k) = [1 \quad 0]x(k)$$
       Is (i) state controllable (ii) output controllable and (iii) observable.

6 a) Discuss the stability analysis of discrete control system using (i) Routh stability   [7]
       criteria (ii) Bilinear transformation
   b) Using Jury's stability criterion, determine the stability of the following discrete [8]
       time systems
       (i) $z^3 + 3.3z^2 + 4z + 0.8 = 0$ (ii) $z^3 - 1.1z^2 - 0.1z + 0.2 = 0$

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7 a) Explain about the digital PID controllers with neat sketch?   [10]

   b) Consider the transfer function system shown. The sampling period T is assumed to be 0.1 sec. obtain G(w).

     [5]
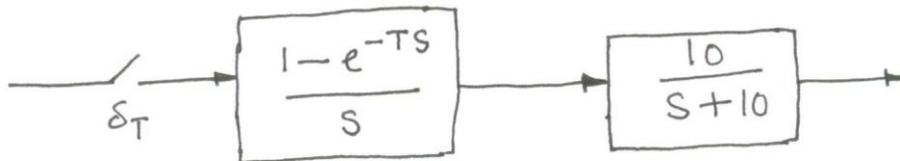
8 a) Explain the concept of state feedback controllers?   [5]

   b) Consider the system $x(k+1) = Gx(k) + Hu(k)$

   $$G = \begin{bmatrix} 0 & 1 \\ -0.16 & -1 \end{bmatrix}, H = \begin{bmatrix} 0 \\ 1 \end{bmatrix}$$

   Determine a suitable state feedback gain matrix 'k' such that the system will have the closed loop poles at $z = 0.5 \pm j0.5$

     [10]

R10

IV B.Tech II Semester Regular Examinations, April/May - 2014
CELLULAR AND MOBILE COMMUNICATIONS
(Electronics and Communication Engineering)

Time : 3 hours   **Max. Marks: 75**
Answer any Five Questions
All Questions carry equal marks
*****

1 a) Describe the principle of operation of cellular mobile system and explain the cellular concept with a neat diagram. [10]
  b) The 2G GSM has 125 channels in the uplink and 125 channels in the down link. Each channel has a bandwidth of 200 kHz. What is the total bandwidth occupied in both uplink and down link. [5]

2 a) What are the various components in a cellular system? Explain briefly. [7]
  b) List the various techniques used to expand the capacity of a cellular system. Explain in detail. [8]

3 a) What are the different types of non co-channel interference in a cellular system? Explain. [8]
  b) Explain the effects of antenna design parameters for the interference in a cellular system. [7]

4 a) Describe the form of a point-to-point model and explain its types. [8]
  b) Explain the mobile signal propagation over water and flat area. [7]

5 a) What are the different types of antennas used for improving coverage and interference reduction at cell site? Explain them. [9]
  b) Draw the structure of horn antenna and explain its operation. [6]

6 a) What is the importance of frequency management chart? Give the structure of the channels in 800 MHz system with frequency ranges. [8]
  b) Explain the overlaid cells concept in detail. [7]

7 a) What are the various handoff strategies based on algorithms of handoff? Explain in detail. [8]
  b) What are the different vehicle locating methods? Explain in detail. [7]

8 a) What are the advantages of digital cellular systems over analog? [3]
  b) Explain a simple GSM network architecture with the help of a neat diagram. [12]

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Code No: **R42041**

R10

Set No. 2

IV B.Tech II Semester Regular Examinations, April/May - 2014
CELLULAR AND MOBILE COMMUNICATIONS
(Electronics and Communication Engineering)

Time : 3 hours   **Max. Marks: 75**

Answer any Five Questions
All Questions carry equal marks
*****

1 a) Why does the mobile phone cell, the basic geographic unit of cellular system, have a hexagonal shape? Explain.   [7]
   b) Describe the analog and digital cellular systems and limitations of AMPS standard.   [8]

2 a) What is the purpose of cell sectoring? Explain how co-channel interference in a cellular system may be reduced?   [8]
   b) Draw the frequency reuse pattern for a cluster size of N=3 and N=7.   [7]

3 a) Derive the expression for carrier-to-interference ratio in a cellular system for normal case and worst-case scenario with an omni-directional antenna.   [10]
   b) Determine the minimum cluster size for a cellular system designed with an acceptable value of C/I =18 dB. Assume the path loss exponent as 4 and co-channel interference at the mobile unit from six equidistant cells in the 1st tier.   [5]

4 a) Explain in detail about near and long distance mobile propagation.   [7]
   b) Describe the various steps involved in finding antenna height gain in a mobile environment.   [8]

5 a) What are the different types of antennas used at cell site? Explain them in detail.   [8]
   b) Define space diversity technique and explain horizontally and vertically oriented space diversity antennas.   [7]

6 a) What are the different types of channel assignment approaches? Explain the channel assignment approach that can be effectively deployed to handle increased traffic situation.   [9]
   b) Explain how paging channels are used for the land originating calls?   [6]

7 a) Why do the micro cellular structures have more number of handoffs per second as compared to macro cellular structures? Explain.   [7]
   b) What type of handoff is used when a call initiated in one cellular system enters another system before terminating? Explain how it works?   [8]

8 a) Explain the frame structure of GSM with a neat diagram.   [8]
   b) Describe the principle, advantages and disadvantages of CDMA technique.   [7]

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R10

Set No. 3

IV B. Tech II Semester Regular Examinations, April/May - 2014
CELLULAR AND MOBILE COMMUNICATIONS
(Electronics and Communication Engineering)

Time: 3 hours   **Max. Marks: 75**

Answer any Five Questions
All Questions carry equal marks
*****

1 a) What are the limitations of conventional mobile telephone system and Describe the various generations of wireless mobile systems. [10]
   b) What are the main advantages and disadvantages of various cellular structures? [5]

2 a) What is the need for frequency reuse? Prove that for a hexagonal geometry, the co-channel reuse ratio is $\sqrt{3N}$, where $N = i^2 + ij + j^2$. [10]
   b) Determine the number of cells in clusters for the following values of the shift parameters i and j in a regular hexagon geometry pattern:
      (i) i=2 and j=4   (ii) i=3 and j=3 [5]

3 a) How the interference is different from noise in a cellular system? Explain. [7]
   b) What are the different types of interference for a cellular system? Explain in detail. [8]

4 a) Explain the effects of human made structures for mobile propagation in open area. [8]
   b) What is mean by foliage? Explain foliage loss. [7]

5 a) What are the directional antennas? Explain how the directional antennas are useful for reducing the interference. [8]
   b) How can a high gain broadband umbrella pattern antenna be constructed for cell site? Explain. [7]

6 a) Describe the concept of frequency management concern to the numbering the channels and grouping into the subset. [8]
   b) Explain the channel assignment to the cell sites based on the adjacent channels. [7]

7 a) What are the various methods of delaying the handoff? Explain briefly. [7]
   b) What is meant by a dropped call? Explain the factors that influence the dropped call rate. [8]

8 a) Describe the features and services of GSM. [5]
   b) Explain the principle of TDMA and CDMA techniques with the help of neat diagrams. [10]

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Code No: **R42041**

R10

Set No. **4**

IV B.Tech II Semester Regular Examinations, April/May - 2014
CELLULAR AND MOBILE COMMUNICATIONS
(Electronics and Communication Engineering)

Time : 3 hours   **Max. Marks: 75**
Answer any Five Questions
All Questions carry equal marks
*****

1 a) Compare the basic technological differences between the GSM and CDMA
       standards.   [8]
   b) The GSM utilizes the frequency band 935-960 MHz for forward link and 890-
       915 MHz for reverse link. Each 25 MHz band is broken into radio channels of
       200 kHz. Each radio channel consists of 8 time slots. Find the number of users
       that can be accommodated in GSM, if
       (i)   No guard band is assumed.   [3]
       (ii)   A guard band of 100 kHz is provided in the upper and lower end. [4]

2 a) Describe the frequency reuse concept in cellular communication system and
       derive the equation for the frequency reuse ratio.   [10]
   b) Why do all cells not have uniform size in a practical cellular network? Explain. [5]

3 a) Explain the co-channel interference reduction factor and derive the general
       formula for C/I.   [8]
   b) What are the various techniques to measure CCI? Explain in detail.   [7]

4 a) Explain the mobile radio propagation over water and flat open area and write
       the general expression.   [8]
   b) Describe the effect of antenna height in near and long distance mobile
       propagation.   [7]

5 a) What are the different types of antennas are used as mobile antenna? Draw the
       structure of patch antenna and explain its operation.   [8]
   b) Explain the concept of diversity antenna spacing in cell site with a simple
       diagram.   [7]

6 a) Describe the grouping of the voice, set-up and paging channels.   [8]
   b) Explain in detail the non-fixed channel assignment.   [7]

7 a) What is meant by handoff? Describe the classification of handoff processes. [5]
   b) What is meant by handoff initiation? Explain the different methods of handoff
       initiation with suitable diagrams.   [10]

8 a) What ate the different types of GSM channels? Explain in detail.   [7]
   b) Explain the principle of CDMA with a neat sketch and write its advantages and
       disadvantages.   [8]

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Code No: **R42051**

R10

Set No. 1

IV B.Tech II Semester Regular Examinations, April/May - 2014
DISTRIBUTED SYSTEMS
(Common to Computer Science & Engineering and Information Technology)

Time : 3 hours   Max. Marks: 75
Answer any Five Questions
All Questions carry equal marks
*****

1	a)	What is distributed systems? Explain its features along with its motivation for constructing.	[8]
	b)	Analyze different challenges of distributed system	[7]
2		What are different system model of distributed system	[15]
3	a)	What are characteristics of the TCP stream communication	[7]
	b)	What is meant by group communication? Explain different types of groups?	[8]
4		What is meant by object model? Describe how distributed object are related to distributed system?	[15]
5	a)	Difference between middleware and operating system support?	[8]
	b)	What is meant by thread? Differentiate between process and threads?	[7]
6	a)	What are the main characteristics of peer to peer systems?	[10]
	b)	Write about overlay routing.	[5]
7	a)	Differentiate between client server algorithm & ring based algorithm	[10]
	b)	Write about multicast synchronization?	[5]
8		What is meant by concurrency control? How it is important in distributed systems	[15]

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Code No: **R42051**

R10

Set No. 2

IV B.Tech II Semester Regular Examinations, April/May - 2014
DISTRIBUTED SYSTEMS
(Common to Computer Science & Engineering and Information Technology)

Time : 3 hours   **Max. Marks: 75**
Answer any Five Questions
All Questions carry equal marks
*****

1	a)	What is meant by obiquitous computing? Explain	[8]
	b)	Summarize the example of distributed systems	[7]
2	a)	What are the difficulties and threats of distributed system	[8]
	b)	Describe the main architectural model of distributed system	[7]
3		What is meant by interprocess communication? How inter process communication is used in distributed systems	[15]
4		What are design issues for remote method invocation?	[15]
5	a)	What is meant by shared memory multiprocessor? Explain.	[8]
	b)	Explain how operating system layer support common middle ware.	[7]
6	a)	Distinguish between IP and overlay routing for peer to peer applications.	[8]
	b)	What are the non functional requirements of peer to peer middleware?	[7]
7	a)	Write about fault tolerance.	[7]
	b)	What are the features required for election algorithms.	[8]
8	a)	Write rules for connecting of nested transaction.	[8]
	b)	Write about locking in distributed systems.	[7]

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Code No: **R42051**

R10

Set No. 3

IV B.Tech II Semester Regular Examinations, April/May - 2014
DISTRIBUTED SYSTEMS
(Common to Computer Science & Engineering and Information Technology)

Time : 3 hours   **Max. Marks: 75**
Answer any Five Questions
All Questions carry equal marks
*****

1	a)	What are different trends in distributed systems?	[8]
	b)	Describe about distributed multimedia systems.	[7]
2	a)	Distinguish between two-tier and three-tier architectures.	[8]
	b)	What are thin clients? Explain any two applications of thin clients.	[7]
3		What meant by marshalling? Differentiate between TCP stream communication and Client Server Communication.	[15]
4	a)	Differentiate between RMI and Remote procedure call.	[8]
	b)	Summarize about implementation of RMI.	[7]
5	a)	Explain architecture of server threads. Give its applications.	[8]
	b)	Write about invocation and address space.	[7]
6	a)	Explain and summarize Napster and its legacy with respect to distributed file system.	[8]
	b)	Explain sun network file system.	[7]
7		Write about bully algorithm and summarize how it is different from other election algorithms.	[15]
8	a)	Explain about locking in strict two phase locking.	[8]
	b)	Write about distributed deadlocks. How to prevent deadlocks in distributed systems	[7]

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Code No: **R42051**

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Set No. 4

IV B.Tech II Semester Regular Examinations, April/May - 2014
DISTRIBUTED SYSTEMS
(Common to Computer Science & Engineering and Information Technology)

Time : 3 hours   Max. Marks: 75

Answer any Five Questions
All Questions carry equal marks
*****

1	a)	Describe the distributed computing as utility.	[8]
	b)	What are different benefits of resource sharing. Explain about its significance	[7]
2		What is meant by event ordering. Explain real time ordering of events.	[15]
3	a)	What are the characteristics of inter process communication.	[10]
	b)	What is meant by external data representation	[5]
4		Write short note on	[15]
		i) java RMI ii) Events and Notifications	
5	a)	What is meant by light weight remote procedure call?	[5]
	b)	how could an interrupt be communicated to a user level server	[5]
	c)	Difference between object and distributed object.	[5]
6	a)	What is meant by failure assumption and failure detectors?	[8]
	b)	Write the algorithm of mutual exclusion.	[7]
7	a)	Explain about coordination and agreement in group communication	[8]
	b)	What meant by total ordering and where it is used.	[7]
8	a)	Write is meant by timestamp ordering and how it is different from optimistic currency control.	[8]
	b)	Write about active and passive replications	[7]

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Code No: **R42121**

R10

IV B.Tech II Semester Regular Examinations, April/May - 2014
SOFTWARE PROJECT MANAGEMENT
(Information Technology)

Time : 3 hours   **Max. Marks: 75**

Answer any Five Questions
All Questions carry equal marks
*****

1 a) What are the five necessary improvements for the waterfall model? Explain.
   b) Discuss about pragmatic software cost estimation.

2   State and explain the principles of conventional Software Engineering?

3 a) What are life cycle phases? Explain in detail.
   b) Discuss about pragmatic artifacts.

4   What is a model? Discuss in detail about model-based architecture.

5 a) Explain the conventional work breakdown structure.
   b) Discuss about periodic status assessment.

6 a) What is the need for process automation? Explain.
   b) What are the four component teams in a default line-of-business organization
       and their responsibilities?

7 a) Discuss Seven core metrics in detail.
   b) Explain the process discrimination that result from differences in project size.

8 a) Write about the Top10 software management principles.
   b) What is the crucial mechanism for promoting team work among stakeholders?
       Explain.

Code No: **R42121**

R10

Set No. 2

IV B.Tech II Semester Regular Examinations, April/May - 2014
SOFTWARE PROJECT MANAGEMENT
(Information Technology)

Time : 3 hours **Max. Marks: 75**

Answer any Five Questions
All Questions carry equal marks
*****

1 a) Define software process model. Explain waterfall model in theory.
   b) Discuss about pragmatic software cost estimation.

2 a) How to reduce software product size? Explain in detail.
   b) What are the principles of modern software management? Explain.

3 a) Describe Inception and Construction phases.
   b) Discuss about Engineering artifacts.

4   Discuss in detail about workflows of the software process.

5 a) Write about results of major milestones in a modern process.
   b) Explain the iteration planning process.

6 a) What are the activities of software management team?
   b) With a neat diagram, explain the software project team evolution.

7 a) Explain about Quality indicators.
   b) Explain the process discrimination that result from differences in stakeholder
       cohesion.

8   Discuss Next generation cost models in detail

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Code No: **R42121**

R10

IV B.Tech II Semester Regular Examinations, April/May - 2014
SOFTWARE PROJECT MANAGEMENT
(Information Technology)

Time : 3 hours   **Max. Marks: 75**

Answer any Five Questions
All Questions carry equal marks
*****

1 a) Discuss about conventional software management performance.
   b) Explain in detail about the three generations of software economics.

2 a) How to improve team effectiveness? Explain.
   b) With an example, explain how object-oriented technology permits corresponding improvements in teamwork and interpersonal communications.

3   Discuss in detail about the artifacts captured in the management set?

4 a) Explain about technical perspective of model-based architecture.
   b) What is a workflow? List top-level workflows and Explain iteration workflows.

5 a) Draw a figure that gives a typical sequence of life-cycle checkpoints. Explain.
   b) Explain the typical minor milestones in the lifecycle of iteration.

6 a) Define round-trip engineering. What is the primary reason for round-trip engineering? Explain.
   b) Explain the stakeholder environments.

7 a) Define architectural risk. Write process discriminators that result from differences in architectural risk.
   b) Explain process discriminators that results from differences in project size.

8 a) State and explain the nine best practices for software management
   b) Explain the culture shifts of modern process transition

Code No: **R42121**

R10

Set No. 4

IV B.Tech II Semester Regular Examinations, April/May - 2014
SOFTWARE PROJECT MANAGEMENT
(Information Technology)

Time : 3 hours   **Max. Marks: 75**

Answer any Five Questions
All Questions carry equal marks
*****

1 a) Explain about the Waterfall model in practice.
   b)   How do you define Software Economics? Explain modern software
        economics.

2 a) What are the Key practices that improve overall software quality:
   b) Describe the various objectives used for the measurement of software size?

3 a) Give an overview of the artifact sets that make the development of a complete
        software system manageable.
   b) What are primary objectives and essential activities of elaboration phase?

4 a) Explain about technical perspective of model-based architecture.

   b) With a table, Explain the allocation of artifacts and the emphasis of each
        workflow in each of the life-cycle phases.

5   With a neat table explain in detail the general status of plans, requirements, and
        products across the major milestones.

6 a) What are the activities of Software architecture team?
   b) Explain about evolution of organizations

7 a) Explain the three fundamental sets of management indicators
   b) Define MTBF and maturity. Draw a graph for maturity expectation over a
        healthy project's life cycle.

8   Write short note on
            a) Early risk resolution
            b) Evolutionary requirements
            c) Denouement

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Code No: **K0221**   **R07**   **Set No. 1**

IV B.Tech II Semester Supplementary Examinations, April/May - 2014
UTILIZATION OF ELECTRICAL ENERGY
(Electrical and Electronics Engineering)
Time : 3 hours   **Max. Marks: 80**
Answer any Five Questions
All Questions carry equal marks
*****

1. a) What is Electric Drive and Write the advantages and disadvantages of electric drive. [6]

   b) A 220 V d.c. shunt motor with constant field excitation drives a load, the torque of which varies as the square of the speed. The armature current is 20 amps, when the motor is running at 550 r.p.m. Find the percentage reduction in the speed of the motor when a resistance of 20 Ohms is connected in series with the armature. Neglect the losses in the motor. [10]

2. a) Write the advantages and disadvantages of direct and indirect arc furnaces [8]

   b) Explain the principle of dielectric heating. [8]

3. a) Write about different types of resistance welding. [8]

   b) Compare AC welding and DC welding. [8]

4. a) Explain about the polar curves as applied to the light sources. [8]

   b) The luminous intensity of a source is 900 candela is placed in the middle of a 12 × 8 m × 4 m room. Calculate the illumination,
   (i) At each corner of the room.   (ii) At the middle of the 10 m wall. [8]

5. a) Compare tungsten filament lamps with florescent tubes. [8]

   b) Four lamps 25 m apart are arranged to illuminate a corridor. Each lamp is suspended at a height of 10 m above the floor level. It each lamp gives 500 C.P in all directions below the horizontal, find illumination at second and third lamp. [8]

6. a) Write about various types of traction systems. [8]

   b) Write short notes on different methods of electric braking. [8]

7. a) Sketch the typical speed-time curve for the train movement and from these derive a simplified speed-time curve [8]

   b) The maximum speed of a suburban electric train is 60km/hr. Its scheduled speed is 40km/hr and duration of stops is 30sec. If the acceleration is 2km/hr/sec and distance between stops is 2kms, determine the retardation. [8]

8. a) What is tractive effort of a train and what are its functions. Derive an expression for the tractive effort developed by a train unit. [6]

   b) A train weighing 300tonnes is going down a gradient of 40 in 1000, it is desired to maintain train speed at 60kmph by regenerative braking. Calculate the power fed in to the line and allow rotational inertia of 15% and efficiency of conversion is 88%. Traction resistance is 30 N/tones. [10]

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Code No: **K0221**

R07

IV B.Tech II Semester Supplementary Examinations, April/May - 2014
UTILIZATION OF ELECTRICAL ENERGY
(Electrical and Electronics Engineering)

Time : 3 hours   **Max. Marks: 80**

Answer any Five Questions
All Questions carry equal marks
*****

1 a) Discuss the advantages and disadvantages of electrical drive over the other
       drives.   [8]
   b) The armature and field resistances of a 230V D.C shunt motor are $0.35\,\Omega$ and
       $150\,\Omega$ respectively. When driving a load of constant torque at 600 r.p.m the
       armature current is 25A. If it is desired to raise the speed from 700 to 1000 rpm,
       what resistance should be inserted in the field circuit? Assume that the
       magnetic circuit is unsaturated.   [8]

2 a) A piece of insulating material is to be heated by dielectric heating. The size of
       the piece is $10\times10\times3$ cm^3. A frequency of 30mega cycles is used and the power
       absorbed is 400watts, determine the voltage necessary for heating and the
       current that flows in the material. The material has a permittivity of 5 and a
       power factor of 0.05.   [8]
   b) Write the essential requirements of heating element and write the causes for
       failure of heating element.   [8]

3 a) Write the advantages and disadvantages of electric welding.   [8]

   b) Explain about carbon arc welding.   [8]

4 a) A lamp giving 300 c.p in all directions below the horizontal is suspended
       2metres above the centre of a square table of 1metre side. Calculate the
       maximum and minimum illumination on the surface of the table.   [8]
   b) Write short note on polar curves and photometry.   [8]

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5 a) Explain the principle and operation of sodium vapor lamp [8]

   b) The front of a building 25 × 12m is illuminated by twenty 1200W lamps arranged so that uniform illumination on the surface is obtained. Assuming a luminous efficiency of 30 lumens / watt and a coefficient of utilization of 0.75. Determine the illumination on the surface. Assume D.F = 1.3, waste light factor 1.2. [8]

6 a) Explain the requirements for ideal traction system and Review the existing electric traction systems in India. [8]

   b) Explain different methods of electric braking of three-phase induction motor. [8]

7 a) Explain the trapezoidal speed – time curve for main line service. [8]

   b) A train has schedule speed of 30 Kmph over a level track, distance between stations being 1 km, Station stopping time is 20 secoonds. Assuming braking retardation of 3kmphps and maximum speed 25% greater than average speed, calculate acceleration required to run the service. [8]

8 a) How does the value of acceleration and retardation affect the specific energy consumption for a given schedule speed [6]

   b) 410 tonne goods train is to be hauled by a locomotive up a gradient of 2%, with acceleration of 1 kmphps. Co-efficient of adhesion is 20%, track resistance 40 N/tonne and effective rotating masses 10% of dead weight. Find the weight of locomotive and number of axles, if axle load is not increased beyond 20 tonnes. [10]

Code No: **K0221** **R07** Set No. 3

IV B.Tech II Semester Supplementary Examinations, April/May - 2014
UTILIZATION OF ELECTRICAL ENERGY
(Electrical and Electronics Engineering)

Time : 3 hours   Max. Marks: 80
Answer any Five Questions
All Questions carry equal marks
*****

1 a) A 230 V, 15 h.P (metric) shunt motor has field and armature resistance as of   [8]
       150Ω, respectively. Calculate the resistance to be inserted in the armature circuit
       to reduce the speed to 600 rpm from 1000 r.p.m, if the full load efficiency is 85%
       and the torque varied as the square of the speed.
   b) What is meant by load equalization. How it achieved.   [8]

2 a) Explain about conduction, convection and radiation in heating.   [8]
   b) Explain with a neat sketch the principle of core type induction furnace.   [8]

3 a) Compare resistance welding and Arc welding.   [8]
   b) Write about various types of equipment used for electric welding.   [8]

4 a) Discuss inverse square law and cosine cube law of illumination.   [8]
   b) Explain about the polar curves as applied to the light sources.   [8]

5 a) Explain about mercury vapor discharge lamp.   [8]
   b) An illumination of 40 lux is to be produced on the floor of a room
       $16m \times 12m$. 15 lamps are required to produced this illumination in the room, it
       40% of the emitted light falls on the floor. Determine the power of the lamp in
       candela. Assume maintenance factor as unity.   [8]

6 a) Write about the various types of track electrification.   [8]
   b) What is electric breaking and Explain how rehostatic braking is done in DC shunt
       motors and series motors.   [8]

7 a) An electric train is to have acceleration and braking retardation of 0.8km/hr/sec
       and 2.5km/hr/sec respectively. If the ratio of maximum speed to average speed is
       1.3 and time for stop is 30sec. Then determine the schedule speed for a run of
       1.8km. Assume simplified trapezoidal speed time curve.   [8]
   b) Explain the typical speed – time curves for urban service.   [8]

8 a) Explain briefly the tractive effort required, while the train is moving up the
       gradient and down the gradient.   [8]
   b) A locomotive accelerates a 300 tonne train up a gradient of 1 in 100 at
       0.9km/hr/sec. Assuming the coefficient of adhesion to be 0.25, determine the
       minimum adhesive weight of the locomotive. Assume train resistance 40
       newtons/tonne and allow 10% for the effect of rotational inertia.   [8]

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IV B.Tech II Semester Supplementary Examinations, April/May - 2014
UTILIZATION OF ELECTRICAL ENERGY
(Electrical and Electronics Engineering)

Time : 3 hours   Max. Marks: 80
Answer any Five Questions
All Questions carry equal marks
*****

1 a) Explain different speed control methods of DC motors.   [8]

   b) Explain about individual drive and group drive and write their advantages and disadvantages.   [8]

2 a) What are the advantages and disadvantages of direct and indirect arc furnaces   [8]

   b) Explain the principle of dielectric heating and write the applications of dielectric heating.   [8]

3 a) Explain about carbon Arc welding.   [8]

   b) Compare AC welding and DC welding.   [8]

4 a) Define solid angle and plane angle and derive the relationship between the solid angle and plane angle.   [8]
   b) Describe the laws of illumination.   [8]

5 a) Write the Comparison between tungsten filament lamps and fluorescent tubes.   [8]

   b) What are the various type of lighting scheme and write the requirements of good lighting.   [8]

6 a) Write the advantages and disadvantages of electric traction.   [8]
   b) Explain how Rehostatic braking is applied to DC motors.   [8]

7 a) Explain crest speed, average speed and scheduled speed of an electric train.   [8]
   b) Explain the speed – time curves for main line service.   [8]

8 a) Derive expression for the tractive effort for a train on a level track.   [6]
   b) An electric train weighing 500 tonnes has to maintain an average speed of 40km/hr between two stations 3km apart on an incline of 1 in 200. The train accelerates at 2km/hr/sec and retards at 3km/hr/sec. The tractive resistance is 5kg/tonne and the allowance for rotational inertia is 10%. Assuming a trapezoidal speed-time curve, find the energy consumption for the run, while going up the gradient. The overall efficiency be taken as 60%.   [10]

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$\boxed{\textbf{Set No. 1}}$

IV B.Tech II Semester Supplementary Examinations, Apr/May 2014
OPTICAL COMMUNICATIONS
(Electronics & Communication Engineering)

Time: 3 hours   Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks
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1. (a) Compare the index profiles and light propagation in optical fibers.

   (b) Compute the NA, acceptance angle and the critical angle of a fiber with $n_1 =$ 1.50 and $n_2 = 1.45$. Also calculate the velocity of light and wavelength in the core at 800nm. [8+8]

2. (a) Compare the threshold optical power of stimulated Brillonin and Raman scattering with in the fibers at an operating wavelength of 1.25 μm. The single mode fiber has a core diameter of 5 μm with an attenuation of 0.5 dB/ Km. The source used is a laser diode with a bandwidth of 500 MHz.

   (b) Describe the following types of optical fibers:
      i. All glass fibers
      ii. Plastic clad fibers. [8+8]

3. (a) Explain about double eccentric and multiple fiber connectors.

   (b) A single mode fiber operating at the wavelength of 1.3 μm is found to have a total material dispersion of 2.81 ns and a total wave guide dispersion of 0.495 ns. Determine the received pulse width and approximate bit rate of the fiber if the transmitted pulse has a width of 0.5 ns. [8+8]

4. Draw and explain the three types of laser structures using built in frequency selective resonator gratings and draw its responses. [16]

5. (a) With the help of neat diagrams describe lens coupling mechanisms to improve coupling efficiency from a fiber optic source.

   (b) Differentiate between Lambertian and monochromatic optical sources in terms of power coupling into a single mode fiber.

   (c) What is equilibrium numerical aperture? Explain the significance of equilibrium numerical aperture on source to fiber power coupling. [6+5+5]

6. (a) Define quantum limit of a fiber optic receiver. Compute the average number of photons per pulse required by a digital fiber optic receiver operating at 850 nm for the BER to be.
      i. 10^{-9}
      ii. 10^{-10}

   (b) Discuss briefly about various sources of errors in a digital fiber optic link.[8+8]

7. Write a short note on the following:

   (a) System considerations in the design of a fiber optic link.

   (b) System rise time calculation with the help of an example. [8+8]

8. (a) List separately, the assumptions made for measurement of dispersion in optical fibers in time and frequency domains.

   (b) How is the 3-dB electrical bandwidth of an optical fiber measured? Explain with the help of suitable test set-up.

   (c) If the output response of an optical fiber is Gaussian in shape, estimate the 3dB electrical bandwidth of the fiber for an RMS output pulse width of 0.5 ns. [4+8+4]

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Set No. 2

IV B.Tech II Semester Supplementary Examinations, Apr/May 2014
OPTICAL COMMUNICATIONS
(Electronics & Communication Engineering)

Time: 3 hours   Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks
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1. (a) Explain the evolution of fiber optic system.

   (b) Discuss the advantages of optical fibers over copper cables.   [8+8]

2. (a) The mean optical power launched in to an optical fiber link is 1.5 mw and the fiber has an attenuation of 0.5 dB km^{-1}. Determine the maximum possible link length without repeaters (assuming loss less connectors) when the minimum mean optical power level required at the detector is 2 μw.

   (b) Briefly describe the following linear scattering losses in optical fiber.

      i. Rayleigh scattering

      ii. Mie scattering.   [8+8]

3. (a) The v-b curve of an optical fiber is found to obey the relationship b = 1-exp (-v). Compute the wave guide dispersion parameter DW. At what value of v-number is the dispersion zero.

   (b) Explain the term dispersion shifted and dispersion flattened in the case of optical fibers. How does one achieves the same? Why do we need such fibers.
   [8+8]

4. (a) Discuss the characteristics of LASER diode.

   (b) Explain the detail, the various factors which affect the performance of optical source.   [8+8]

5. (a) Describe various mechanisms usable to increase power coupling from an LED into a single mode fiber. Discuss the intricacies involved.

   (b) An LED with circular emitting region of radius 200 μm and an axial radiance of 60 W / cm²- Sr at 100mA drive current is coupled into a step index fiber of 50μm radius and 0.24 numerical aperture.

      i. Compute the power coupled into this step index fiber.

      ii. Calculate the power coupled from the source specified about into a parabolic index graded-index fiber of same size as the step index fiber with n_1=1.485 and $\Delta = 0.01$.   [6+5+5]

6. (a) Derive an expression for Signal-to-Noise ratio at the output of a PIN diode receiver that includes all the possible noise sources.

   (b) Modify the SNR expression of above PIN diode for a silicon APD with an internal multiplication factor of M and a unity excess noise factor, x.   [8+8]

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7. (a) Describe a procedure to plan budget of optical power to cater for all the possible losses in the design of a fiber optic link.

   (b) Discuss the constraints in selection of components for designing a simplex point-to-point link. [8+8]

8. (a) Define polarization mode Dispersion? Describe a method to measure polarization mode dispersion in an optical fiber?

   (b) Describe a procedure to measure baseband fiber frequency response. If this frequency response is used in dispersion measurement, comment on the type of dispersion measured and domain in which measurement is made. [8+8]

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Set No. 3

IV B.Tech II Semester Supplementary Examinations, Apr/May 2014
OPTICAL COMMUNICATIONS
(Electronics & Communication Engineering)

Time: 3 hours   Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks
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1. (a) Describe the basic block diagram of a optical communication system and explain how it differs from conventional co-axial cable communication system?

   (b) Determine the normalized frequency at 0.82 μm for a step index fiber having 25 μm core radius, $n_1 = 1.48$ and $n_2 = 1.46$. How many modes propagate in this fiber at 0.82 μm. What percentage of optical fiber power flows in cladding. [8+8]

2. (a) Explain about "chalgenide glass fibers".

   (b) Commonly available single mode fibers have beat lengths in the range 10cm<Lp<2m. What range of refractive index differences does this correspond to for λ= 1300 nm? [8+8]

3. (a) Derive an expression for multiple time difference (Δt/z) in the multi path dispersion of the optical fiber.

   (b) Mention the principal requirements of a good connector design. [8+8]

4. Describe the different modes available in the laser diode and derive the condition for reaching the lasing threshold optical gain. [16]

5. (a) With the help of neat diagrams describe lens coupling mechanisms to improve coupling efficiency from a fiber optic source.

   (b) Differentiate between Lambertian and monochromatic optical sources in terms of power coupling into a single mode fiber.

   (c) What is equilibrium numerical aperture? Explain the significance of equilibrium numerical aperture on source to fiber power coupling. [6+5+5]

6. Describe probable sources of signal degradation due to noise through relevant mathematical expressions in:

   (a) Analog fiber optic receivers

   (b) Digital fiber optic receivers. [8+8]

7. (a) Describe in detail various calculations and analyses required for designing a fiber optic link.

   (b) Explain the analyses with suitable examples and graphical representation. [8+8]

8. (a) Describe cutback method for measurement of attenuation in an optical fiber with the help of suitable diagrams.

   (b) Discuss the merits and drawbacks of cut back method of measurement of attenuation.

   (c) Output of a PIN detector preamplifier of an optical receiver for 3.6Km fiber is 4.16 Volts at 820nm wavelength. The output of PIN preamplifier at the same wavelength increases to 12.6 Volts when this fiber is cutback to 5m length. Compute the total attenuation and attenuation per unit length (dB/Km) of the cut-off fiber. [8+4+4]

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Set No. 4

IV B.Tech II Semester Supplementary Examinations, Apr/May 2014
OPTICAL COMMUNICATIONS
(Electronics & Communication Engineering)
Time: 3 hours   Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks
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1. (a) Draw the block diagram of an optical transmission link and explain the function of each element.
   (b) Discuss the applications of optical fiber system.   [8+8]

2. (a) Discuss mode cut off conditions in optical fibers.
   (b) A single mode fiber has a beat length in the range 7cm to 1m. What range of propagation constant difference does this correspond to for an operating wavelength of 1500 nm?   [8+8]

3. (a) Discuss about the dispersion adjusted single mode fiber with diagrams.
   (b) Explain about cylindrical ferrule connectors.   [8+8]

4. (a) Explain with relevant diagrams the basic principle of confinement of carriers optical power in the active region of a double hetero junction LED.
   (b) Discuss different modulation drive circuits for LED and explain their operations.   [8+8]

5. (a) With the help of neat diagrams describe lens coupling mechanisms to improve coupling efficiency from a fiber optic source.
   (b) Differentiate between Lambertian and monochromatic optical sources in terms of power coupling into a single mode fiber.
   (c) What is equilibrium numerical aperture? Explain the significance of equilibrium numerical aperture on source to fiber power coupling.   [6+5+5]

6. Describe the following briefly:
   (a) Functioning and performance of an analog fiber optic receiver.
   (b) Noise sources in a PIN photo detector.   [8+8]

7. (a) Discuss a method to compute system rise-time and maximum possible data rate in RZ data format of a given fiber optic link.
   (b) Describe the system considerations in component choice for a fiber optic link.   [8+8]

8. Describe the following briefly:
   (a) Line coding in Optical Communication links.
   (b) Inter modal dispersion measurement in optical fibers.   [8+8]

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Set No. 1

IV B.Tech II Semester Supplementary Examinations, Apr/May 2014
MANAGEMENT SCIENCE
(Common to Computer Science & Engineering and Information Technology)
Time: 3 hours   Max Marks: 80
Answer any FIVE Questions
All Questions carry equal marks
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1. Describe the theory of scientific management, and explain how it was criticised.
   [16]

2. Describe briefly the various steps involved in organising procedure.   [16]

3. What is statistical quality control? Describe its importance in today's quality control problems.   [16]

4. What is inventory control? Give a brief classification of inventories.   [16]

5. What is job evaluation? Explain the objectives of job evaluation. How do you prepare the ground for evaluation jobs?   [16]

6. Explain the uses of variance &expected time in relation to critical paths in a PERT network.   [16]

7. How would a company achieve synergy among different functions and business units?   [16]

8. Explain in detail the Taguchi technique of quality improvement.   [16]

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$$\boxed{\textbf{Set No. 2}}$$

IV B.Tech II Semester Supplementary Examinations, Apr/May 2014
MANAGEMENT SCIENCE
(Common to Computer Science & Engineering and Information Technology)
Time: 3 hours   Max Marks: 80
Answer any FIVE Questions
All Questions carry equal marks
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1. What is motivation? Explain its importance.   [16]

2. What do you mean by matrix organisation? How does it differ from project organisation? Discuss the situations under which matrix organisation can be used fruitfully.   [16]

3. Describe the factors influencing the plant layout.   [16]

4. Explain the following:

   (a) Bin cards

   (b) Stores ledger

   (c) Inward and outward registers

   (d) Open tender and closed tender.   [4×4]

5. Evaluate the significance of performance appraisal in an educational institution. How would you make it more effective?   [16]

6. Given the cost and time data for a particular project . Determine the optimal cost schedule for the project by drawing project schedule Vs total cost. Overhead cost is Rs. 50 per day.   [16]

Activity	Normal		Crash	
	Time(days)	Cost(Rs)	Time(days)	Cost(Rs)
1-2	3	180	1	220
2-3	4	130	2	180
2-4	7	80	3	120
3-4	5	80	2	140

7. What are the steps involved in corporate planning?   [16]

8. What are the different methods TQM? Explain any two methods in briefly.   [16]

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Set No. 3

IV B.Tech II Semester Supplementary Examinations, Apr/May 2014
MANAGEMENT SCIENCE
(Common to Computer Science & Engineering and Information Technology)
Time: 3 hours
Max Marks: 80
Answer any FIVE Questions
All Questions carry equal marks
⋆ ⋆ ⋆ ⋆ ⋆

1. What are the Mayo's Hawthorne experiments? Why are they significant even to-day? [16]

2. Describe Taylor's functional type of organisation stucture with its advantages and limitations. [16]

3. Define work study. Explain its objectives. [16]

4. A Company requires 2000 units per month of raw material for its production. The cost of placing an order is Rs. 100 per order. The inventory carrying cost is 10% per year per unit of average inventory. The company maintains safety stock equal to 20 days requirement and the normal lead time is 10 days. The company works for 300 days in a year. If purchase price of raw material is Rs. 25 per unit, determine EOQ, Number of orders to be placed in a year, maximum inventory and re-order point. [16]

5. Evaluate the significance of performance appraisal in an educational institution. How would you make it more effective? [16]

6. Explain how do you determine the probability of meeting the scheduled date of completion of project. [16]

7. Define the term strategic planning. State its advantages. Discuss the sequential steps followed in strategic planning. [16]

8. Explain the philosophy behind Total quality management customer satisfaction and continuous improvement. What are the objectives of TQM? [16]

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Set No. 4

IV B.Tech II Semester Supplementary Examinations, Apr/May 2014
MANAGEMENT SCIENCE
(Common to Computer Science & Engineering and Information Technology)
Time: 3 hours   Max Marks: 80
Answer any FIVE Questions
All Questions carry equal marks
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1. What do you mean by social responsibility of managers? How can social responsibility be made operational in an organisation? [16]

2. What is committee organisation? Explain the advantages and disadvantages of committee organisation. [16]

3. Explain the 'batch production' system. What are its features? [16]

4. A Company requires 2000 units per month of raw material for its production. The cost of placing an order is Rs. 100 per order. The inventory carrying cost is 10% per year per unit of average inventory. The company maintains safety stock equal to 20 days requirement and the normal lead time is 10 days. The company works for 300 days in a year. If purchase price of raw material is Rs. 25 per unit, determine EOQ, Number of orders to be placed in a year, maximum inventory and re-order point. [16]

5. Discuss the merits and demerits of Payment by Time and Payment by Results. [16]

6. The activities involved in project with their respective three time estimate are given below.

   (a) Find the expected duration and variance of the project.

   (b) What is the probability that the project will be completed at least 2 weeks later than expected?

   (c) What is the probability of the entire project? [5+5+6]

Activity	T_o	T_m	T_p
1-2	1	1	7
1-3	2	5	14
2-3	2	2	14
3-4	3	6	15

7. What are the steps involved in corporate planning? [16]

8. Explain some of the causes that can result in the failure of an MIS. [16]

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