Code: 9A04706

B.Tech IV Year I Semester (R09) Regular & Supplementary Examinations December/January 2013/14
DIGITAL DESIGN THROUGH VERILOG HDL
(Electronics & Communication Engineering)

Time: 3 hours   Max. Marks: 70

Answer any FIVE questions
All questions carry equal marks

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1   (a)   Explain how the components of the target can be described at different levels with the help of the constructs in verilog.
    (b)   With suitable example, explain the synthesis of the following language construct.
          (i) Compiler directives   (ii) User defined tasks.

2   (a)   Discuss about different types of tri-state buffers available in verilog as primitives.
    (b)   Using the data flow description style, write a verilog HDL logic, use the specified delays. For AND gate 5 ns, OR gate 4 ns, NOT gate 1 ns.
    (c)   Differentiate VHDL & VERILOG.

3   Explain about following statements with example:
    (a)   The case statement.
    (b)   Wait construct.
    (c)   For loop.
    (d)   Event.

4   (a)   Draw the circuit diagram of switch level CMOS two-input NAND gate and develop its source code using verilog HDL.
    (b)   Implement a 4-to-1 MUX using CMOS transmission gates.

5   (a)   Explain about the following terms with respect to verilog VHDL.
          (i) Module path delays.   (ii) Hierarchical access.
    (b)   Explain about different system tasks and functions available in VERILOG with example.

6   (a)   Implement the behavioral model for moove-type state machine using verilog HDL source code.
    (b)   Write about:
          (i) Derivation of SM charts.   (ii) Linked state machines.

7   (a)   Discuss about Xilinx 3000 series FPGAs.
    (b)   Explain about CPLDs.

8   (a)   Describe static RAM memory.
    (b)   Explain about the designing of micro-controller.

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Code: 9A04706

B.Tech IV Year I Semester (R09) Regular & Supplementary Examinations December/January 2013/14
DIGITAL DESIGN THROUGH VERILOG HDL
(Electronics & Communication Engineering)

Time: 3 hours   Max. Marks: 70

Answer any FIVE questions
All questions carry equal marks

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1   (a)   Explain about the keyword 'module' used in verilog program in detail.
     (b)   With suitable example, explain the synthesis of the following language constructs.
            (i) Multi-cycle operations.   (ii) User-defined functions.

2   (a)   Explain the styles for synthesis of combinational logic with respect to various vendor
            support tools.
     (b)   Prepare a full adder module using half-adder module and OR gate primitive.
     (c)   Differentiate VHDL & VERILOG.

3   (a)   Explain the behavioral descriptions for simulation of simultaneous procedural
            assignments used in verilog HDL give suitable example.
     (b)   Explain about blocking and non-blocking assignments.

4   (a)   Explain switch level models of static CMOS circuits with neat diagrams.
     (b)   Explain the concept of combination and resolution of signal strength with an example.

5   (a)   Explain about the parameters constructs that are used in debugging modules.
     (b)   Explain the terms:
            (i) Compiler directives.
            (ii) Module path delays.

6   (a)   Explain behavioral models of finite state machines.
     (b)   Discuss about the following:
            (i) State machine charts.
            (ii) Linked state machines.

7   (a)   Explain about designing aspects with FPGA's.
     (b)   Discuss in detail about CPLDs.

8   (a)   Explain about static RAM memory.
     (b)   Discuss about interfacing memory to a microprocessor bus.
     (c)   Write short notes on UART design.

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Code: 9A04706

B.Tech IV Year I Semester (R09) Regular & Supplementary Examinations December/January 2013/14
DIGITAL DESIGN THROUGH VERILOG HDL
(Electronics & Communication Engineering)

Time: 3 hours   Max. Marks: 70

Answer any FIVE questions
All questions carry equal marks

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1   (a)   Explain about the terms related to VERILOG.
          (i) Simulation and synthesis.
          (ii) Test benches.
    (b)   With relevant example explain the synthesis approach of compiler directives language construct.

2   (a)   Implement synthesizable gate level verilog HDL code with the aid of suitable logic diagram. Mention the procedural steps for HDL- based synthesis.
    (b)   Prepare an adder module to add excess-3 coded digits.
    (c)   Differentiate VHDL & VERILOG.

3   (a)   Explain the behavioral descriptions for simulation of simultaneous procedural assignments used in verilog HDL give suitable example.
    (b)   Explain about the following with example:
          (i) Forever loop.
          (ii) Multiple always blocks.

4   (a)   Draw the circuit diagram of switch level CMOS two-input NAND gate and develop its source code using verilog HDL.
    (b)   Explain about primitive gate output strength values relevant to strength modeling in verilog HDL.

5   (a)   Explain about different system tasks and functions available in VERILOG with example.
    (b)   Explain the terms:
          (i) Module path delay.
          (ii) Hierarchical access.

6   (a)   Develop the verilog behavioral HDL model for Moore-type finite state machine.
    (b)   Discuss about:
          (i) Realization of SM charts.
          (ii) Linked state machines.

7   (a)   Discuss about designing aspects of FPGAs.
    (b)   Explain about CPLDs.

8   (a)   Discuss about static RAM memory.
    (b)   Explain about designing aspect of microcontroller CPU.

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Code: 9A04706

B.Tech IV Year I Semester (R09) Regular & Supplementary Examinations December/January 2013/14
DIGITAL DESIGN THROUGH VERILOG HDL
(Electronics & Communication Engineering)

Time: 3 hours   Max. Marks: 70

Answer any FIVE questions
All questions carry equal marks

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1   (a)   Explain about following terms related to VERILOG.
          (i) Simulation & synthesis.
          (ii) Test benches.
    (b)   With suitable example, explain the synthesis of the user-defined functions language
          construct.

2   (a)   Explain about AND GATE PRIMITIVE with an example.
    (b)   Describe the behavior of a JK flip flop using an always statement.

3   (a)   Discuss about some specific delays which are associated with procedural
          assignments.
    (b)   Explain how design description at behavioral level is done.

4   (a)   Draw the circuit diagram of switch level CMOS two-input NAND gate and develop its
          source code using verilog HDL.
    (b)   Explain about primitive gate output strength values relevant to strength modeling in
          verilog HDL.

5   (a)   Explain about module path delays in verilog HDL with examples.
    (b)   Explain the terms:
          (i) Compiler directives.
          (ii) Parameters.

6   (a)   Implement the behavioral model for Moore-type finite state machine using verilog
          HDL source code.
    (b)   Explain about:
          (i) State machine charts.
          (ii) Linked state machines.

7   (a)   Discuss about Xilinx 3000 series FPGAs.
    (b)   Explain about CPLDs.

8   (a)   Discuss about interfacing memory to a microprocessor BUS.
    (b)   Explain about design of microcontroller CPU.

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B.Tech IV Year I Semester (R09) Regular & Supplementary Examinations December/January 2013/14
COMPUTER NETWORKS
(Common to ECE and EIE)

Time: 3 hours   Max Marks: 70

Answer any FIVE questions
All questions carry equal marks
*****

1 (a) Two networks each provide reliable connection oriented services. One of them offers a reliable byte stream and other offers a reliable message stream. Are these identical? If so, why is the distinction made? If not, give an example of how they differ.
   (b) Briefly explain about the working of Batcher-Banyan switch.

2 (a) Discuss the functions of data link layer in brief.
   (b) What is pipelining? Discuss the two approaches dealing with errors in the presence of pipelining.

3   What is a token? Discuss the protocol of token ring in general. Discuss with example how priority is implemented in a token ring LAN.

4 (a) What are the responsibilities of network layer? Explain them.
   (b) Write short notes on hierarchical routing.

5 (a) What is ARP? Explain it with suitable example.
   (b) Explain the role of internet message control protocol in routing.

6 (a) What principle is used in negle's algorithm? Explain in detail.
   (b) Explain the TCP checksum in detail with its header format.

7 (a) Explain the role of user agent of an e – mail system.
   (b) Write short notes on MIME.

8 (a) With the help of a neat sketch explain the encryption model.
   (b) Give brief description about the substitution ciphers.

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B.Tech IV Year I Semester (R09) Regular & Supplementary Examinations December/January 2013/14
COMPUTER NETWORKS
(Common to ECE and EIE)

Time: 3 hours   Max Marks: 70

Answer any FIVE questions
All questions carry equal marks
*****

1 (a) List advantages and disadvantages of having international standards for network protocols.
  (b) Briefly explain the various types of the wireless transmissions.

2 (a) Discuss the error control technique which is commonly used in data network.
  (b) Imagine that you are writing the data link layer software for a line used to send data to you, but not from you. The other end uses HDLC with a 3-bit sequence number and a window size of seven frames. You would like to buffers as many out of sequence frames as possible to enhance efficiency, but you are not allowed to modify software on the sending side. Is it possible to have a receiver window greater than one, and still guarantee that the protocol will never fail? If so, what is the largest window that can safely use?

3 (a) Briefly explain about bridges.
  (b) What is pure ALOHA and slotted ALOHA? Mention the advantages of slotted ALOHA.

4 (a) With an example, explain any one adaptive routing algorithm.
  (b) Write short note on comparison of datagram and virtual circuit subnets.

5 (a) Discuss briefly about the ways that the networks can differ.
  (b) Present a detailed note on connection of the different network devices.

6 (a) A client sends a 128-byte request to a server located 100 km away over a 1-gigabit optical fiber. What is the efficiency of the line during the remote procedure call?
  (b) Discuss the advantages and disadvantages of credits versus sliding window protocols.

7 (a) Give brief description about the session initiation protocol.
  (b) List and explain the jobs of a media player.

8 (a) Write short notes on the symmetric key signatures.
  (b) Explain RSA technique to convert the plain text to cipher text by using the suitable example.

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B.Tech IV Year I Semester (R09) Regular & Supplementary Examinations December/January 2013/14
COMPUTER NETWORKS
(Common to ECE and EIE)

Time: 3 hours   Max Marks: 70

Answer any FIVE questions
All questions carry equal marks
*****

1 (a) What is the difference between a confirmed service and an unconfirmed service? For each of the following, tell whether it might be a confirmed service, an unconfirmed service, both or neither. (i) Connection establishment. (ii) Data transmission. (iii) Connection release.
  (b) Briefly explain the working of Knock-out switch.

2   Explain in detail about the two data link layer in protocols widely used in internet.

3   A large population of ALOHA uses manages to generate 50 requests /sec, including both originals and retransmissions. Time is slotted in the units of 20 msec.
      (i) What is the chance of success on the first attempt?
      (ii) What is the probability of exactly k collisions and then a success?
      (iii) What is the expected number of transmission attempts needed?

4   What is optimality principle? With an example explain distance vector routing algorithm.

5 (a) Explain, how tunneling helps in connection of two different networks.
  (b) Explain the reasons, why the maximum size is imposed on packets.

6 (a) Discuss in brief about the services provided by the transport layer.
  (b) What is addressing? Explain it in detail.

7 (a) Compare the H.323 with SIP.
  (b) Discuss in detail about the digital systems.

8 (a) Write short notes on symmetric key signatures.
  (b) What is message digest? Explain it in detail with a suitable example.

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B.Tech IV Year I Semester (R09) Regular & Supplementary Examinations December/January 2013/14
COMPUTER NETWORKS
(Common to ECE and EIE)

Time: 3 hours   Max Marks: 70

Answer any FIVE questions
All questions carry equal marks
*****

1 (a) List two ways in which the OSI reference model and TCP/IP reference model are the same and the way in which they differ.
   (b) What is the problem with the knock-out switch? Suggest a solution.

2   A 16-bit messages are transmitted using a hamming code. How many check bits are needed to ensure that receiver can detect and correct single bit errors? Show the bit pattern transmitted for the message 1101001100110101. Assume that even parity is used in the hamming code.

3 (a) Explain how the token ring is maintained in detail.
   (b) Briefly explain the IEEE 802.11 protocol stack.

4 (a) What is shortest path routing? Explain Dijkstra's algorithm for shortest path with example.
   (b) Compare virtual circuit and datagram.

5 (a) Draw and explain the header format of IPv4.
   (b) List the various principles that are present in RFC 1958.

6 (a) Differentiate between the flow control and buffering.
   (b) Explain the role of transport address in establishing the connection to a remote application.

7 (a) Draw the hardware architecture for video server and explain it in detail.
   (b) Explain how to synchronize the audio and video using MPEG – 1.

8 (a) Give brief description about the advanced encryption standard.
   (b) How can we convert the message to cipher by using the counter encryption mode?

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B.Tech IV Year I Semester (R09) Regular & Supplementary Examinations December/January 2013/14
MANAGEMENT SCIENCE
(Common to ECE, E.Con.E and EIE)

Time: 3 hours   Max Marks: 70

Answer any FIVE questions
All questions carry equal marks
*****

1   Define management. Explain brightly the various contributions made by F.W Taylor.

2   What is line organization? Explain it underlining its advantages, drawbacks and applications.

3   What are the basic patterns or types of plant layout? Give a critical appraisal of each.

4 (a)   What is meant by inventory control? Explain briefly about EOQ.
  (b)   Find E.O.Q. from the following data:
        Average annual demand 30,000 units
        Inventory carrying costs is 12% of the unit value per year
        Cost of placing the order is Rs.70/-, Cost/Unit = Rs.2/-.

5 (a)   Explain the objectives of a personnel management.
  (b)   Explain the principles of a good personnel policy.

6   Time estimates (in weeks) for the activities of a PERT network are given below.

Activity	1 - 2	1 - 3	1 - 4	2 - 5	3 - 5	4 - 6	5 - 6
Optimistic time(t_o)	1	1	2	1	2	2	3
Most likely time (t_m)	1	4	2	1	5	5	6
Pessimistic time(t_p)	7	7	8	1	14	8	15

  (a)   Draw network diagram and identify all paths.
  (b)   Determine expected project length.
  (c)   Calculate standard deviation and variance of the project.
  (d)   What is the probability that the project will be completed at least 4 weeks earlier than the expected time?

7   Explain SWOT analysis. Analyses how SWOT analysis can be used to evolve appropriate corporate strategy.

8   Explain the term quality and quality control. How does quality control differ from conventional inspection?

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B.Tech IV Year I Semester (R09) Regular & Supplementary Examinations December/January 2013/14
MANAGEMENT SCIENCE
(Common to ECE, E.Con.E and EIE)

Time: 3 hours   Max Marks: 70

Answer any FIVE questions
All questions carry equal marks
*****

1   What are the three levels of management? What functions do you find at each of these levels? Explain.

2   Write short notes on:
   (a) Steps for designing an organization structure.
   (b) Boundary less organization.

3   What do you understand by quality control? Explain its significance and techniques.

4 (a)   Define E.O.Q. Explain the procedure adopted for purchase of material.
   (b) Explain the importance of bincard and score ledge.

5 (a)   How does job analysis is differ from job description?
   (b) What is job evaluation? What are its objectives?

6   Table given below furnish the information about the project network.
        The overhead charges are Rs 1300 per day.

Activity	Normal Time (days)	Cost(Rs)	Crash Time (days)	Cost(Rs)
1 - 2	9	8000	7	10000
1 - 3	5	5000	3	8000
2 - 3	7	7000	5	8600
2 - 4	8	6000	6	7000
3 - 4	6	9000	4	11400

        Determine: (i) The normal cost of the project. (ii) Optimum cost under crashing.

7   What is strategy implementation? How for it is different from strategy formulation?

8   Describe how Indian companies achieve strategic fit between supply chain strategy and competitive strategy in this era of globalization.

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B.Tech IV Year I Semester (R09) Regular & Supplementary Examinations December/January 2013/14
MANAGEMENT SCIENCE
(Common to ECE, E.Con.E and EIE)

Time: 3 hours   Max Marks: 70

Answer any FIVE questions
All questions carry equal marks
*****

1   Bring out the contrast between Theory -X and Theory -Y.

2   Differentiate the following with appropriate charts:
   (a)   Line organization and staff organization.
   (b)   Functional organization and line-staff organization.

3   Explain the following:
   (a)   Statistical quality control.
   (b)   Work study.
   (c)   Plant location and plant layout.

4   Explain the concept of economic order quantity. Explain the variables that go into the
        determination of EOQ. Show how the formula is derived.

5   What is personnel management? What are its features and functions?

6   Find the critical path of the following project after drawing the complete PERT network.

Activities		A	B	C	D	E	F	G	H	I	J
Precedence relationship		--	--	A	C	B	E	E	F	G	D,H,I
Time estimates (days	Pessimistic	2	1	4	4	5	1	2	3	3	2
	Optimistic	6	5	6	10	7	3	2	7	9	12
	Most likely	4	3	5	7	6	2	2	5	6	4

        What is the probability that the programme will be completed? Calculate the standard
        deviation and the expected project length.

7   Do you agree with the statement "A company should go in for available internal skills and
        a policy of promotion from with always"? Justify.

8   Write short notes on :
   (a)   Capacity maturity model.
   (b)   Just-In-Time.
   (c)   Balanced scored card.

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B.Tech IV Year I Semester (R09) Regular & Supplementary Examinations December/January 2013/14
MANAGEMENT SCIENCE
(Common to ECE, E.Con.E and EIE)

Time: 3 hours   Max Marks: 70

Answer any FIVE questions
All questions carry equal marks
*****

1   Explain the concept of management and organization and analyze their relationship.

2   Write short notes on:
   (a) What is the need for departmentalism and decentralization?
   (b) Distinguish between departmentation and decentralization

3 (a)   What are the desirable objectives of a good plant layout?
   (b) Explain with suitable examples the factors that influence the plant layout.

4 (a)   What do you understand by 'marketing mix'?
   (b) Explain briefly the basic elements in marketing mix.

5 (a)   What are the steps involved in recruitment and selection of manpower?
   (b) What is the purpose of training? Explain how training can be imparted.

6   A small project is composed of seven activities. Time estimates are listed in the table are
        as follows.

Activity	Estimated duration (weeks)		
	Optimistic	Most likely	Pessimistic
1 - 2	1	1	7
1 - 3	1	4	7
1 - 4	2	2	8
2 - 5	1	1	1
3 - 5	2	5	14
4 - 6	2	5	8
5 - 6	3	6	15

   (a) Draw the project network.
   (b) Find the expected duration and variance of each activity.
   (c) Calculate the variance and standard deviation of project length. What is the probability
        that the project will be completed (i) At least four weeks earlier than expected? (ii) No
        more than 4 weeks later than expected?

7   Explain various types of strategies.

8   Write short notes on the following:
   (a) Six sigma and CMM levels.
   (b) Performance management.
   (c) End user computing.
   (d) ERP.

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B.Tech IV Year I Semester (R09) Regular & Supplementary Examinations December/January 2013/14
EMBEDDED REAL TIME OPERATING SYSTEMS
(Common to ECE, E.Con.E, EIE and CSS)

Time: 3 hours

Max. Marks: 70

Answer any FIVE questions
All questions carry equal marks

*****

1 (a) Explain how embedded system is different from general purpose system.
  (b) What is the need for actuator and explain with an example?

2 What are the different computational models in embedded system?

3 (a) What are the different digital components used in embedded systems?
  (b) Write some of the applications of embedded systems using digital components.

4 Explain in detail about multiprocessing and multitasking.

5 (a) Write the use of timer and counting devices.
  (b) What are the protocols of serial bus communication?

6 Explain how to model a multiprocessor system.

7 (a) Write the advantages of memory management in an OS for embedded system.
  (b) Discuss about preemptive scheduling model.

8 With the help of block diagram, explain the different embedded systems used in a car.

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B.Tech IV Year I Semester (R09) Regular & Supplementary Examinations December/January 2013/14
EMBEDDED REAL TIME OPERATING SYSTEMS
(Common to ECE, E.Con.E, EIE and CSS)

Time: 3 hours

Max. Marks: 70

Answer any FIVE questions
All questions carry equal marks

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1 (a) What is an embedded system and write its applications?
  (b) With an example, explain about sensor and its applications.

2 (a) Explain hardware/software co-design process.
  (b) Write a short note on UML.

3 (a) What are the different analog components used in embedded systems?
  (b) Write some of the applications of embedded systems using analog components.

4 What is the need for operating systems and write different types of operating systems?

5 With examples, explain different types of IO devices used in communication buses.

6 How to model event controlled program flow?

7 (a) What are the services provided by operating system?
  (b) Write the need for timer function in real-time operating system.

8 Explain in detail about hardware and software architecture for robot orchestra.

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B.Tech IV Year I Semester (R09) Regular & Supplementary Examinations December/January 2013/14
EMBEDDED REAL TIME OPERATING SYSTEMS
(Common to ECE, E.Con.E, EIE and CSS)

Time: 3 hours   Max. Marks: 70

Answer any FIVE questions
All questions carry equal marks

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1   (a)   Write the different types of embedded systems.
    (b)   Explain the core units present around the embedded systems.

2   (a)   Explain in detail about building blocks of UML.
    (b)   What is the important hardware software trade-offs?

3   Explain about EDA tools used in embedded system design.

4   Write a short note on process and threads and explain how it works together.

5   Explain the importance of serial and parallel communication devices and write its advantages.

6   Write the features of UML and explain UML modeling.

7   Explain the common scheduling models used by schedulers.

8   (a)   With the help of block diagram, explain the different units of ACC system.
    (b)   Write a short note on hardware and software architecture of ACC.

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B.Tech IV Year I Semester (R09) Regular & Supplementary Examinations December/January 2013/14
EMBEDDED REAL TIME OPERATING SYSTEMS
(Common to ECE, E.Con.E, EIE and CSS)

Time: 3 hours   Max. Marks: 70

Answer any FIVE questions
All questions carry equal marks

*****

1 (a) With example, explain the purpose of embedded system.
   (b) What are the various methods used for developing embedded system? Explain how it works.

2 (a) Write the differences between FSM and HCFSM.
   (b) Explain the role of programming language in hardware software co-design.

3   Explain in detail about embedded firmware design.

4   Discuss about how communication takes between tasks and explain how they are synchronized.

5 (a) Explain about parallel communication network using different buses.
   (b) What are the different network protocols?

6   With example, explain SDFG and HSDFG.

7 (a) Explain how memory and power is saved in RTOS.
   (b) What are the common security issues that occur in OS?

8   Explain the requirements and applications of mobile phone software for key inputs.

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B.Tech IV Year I Semester (R09) Regular & Supplementary Examinations December/January 2013/14
OPTICAL COMMUNICATIONS
(Electronics & Communication Engineering)

Time: 3 hours   Max. Marks: 70

Answer any FIVE questions
All questions carry equal marks
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1 (a) With the help of electromagnetic spectrum, explain about the historical development of optical fiber communications.
   (b) A graded index fiber has a core with a parabolic refractive index profile which has a diameter of 50 μm. The fiber has a NA of 0.2. Estimate the total number of guided modes propagating in the fiber when it is operating at a wavelength of 1 μm.

2 (a) What is MFD of single mode fiber? Explain with suitable structure.
   (b) What are active glass fibers? Explain in detail.

3 (a) What is attenuation? Explain.
   (b) When the mean optical power launched into an 8 km length of fiber is 120 μW, the mean optical power at the fiber output is 3 μW. Determine.
        (i) The overall signal attenuation or loss in decibels through the fiber assuming there are no connectors or splices.
        (ii) The signal attenuation per km for the fiber.
        (iii) The overall signal attenuation for a 10 km optical link using the same fiber with splices at 1 km intervals, each giving an attenuation of 1 dB.
        (iv) The numerical "Input/output" power ratio in (iii).

4 (a) What is a fiber coupler? Explain about three and four port couplers.
   (b) A four port multimode fiber FBT coupler has 60 μW optical power launched into port 1. The measured output power at ports 2, 3 and 4 are 0.004, 26.0 and 27.5 μW respectively. Determine the excess loss, the insertion losses between the input and output ports, the crosstalk and the split ratio for the device.

5 (a) Define quantum efficiency and LED power. Explain.
   (b) A planar LED is fabricated from gallium arsenide which has a refractive index of 3.6.
        (i) Calculate the optical power emitted into air as a percentage of the internal optical power for the device when the transmission factor at the crystal-air interface is 0.68.
        (ii) When the optical power generated internally is 50% of the electrical power supplied, determine the external power efficiency.

6 (a) Write short notes on fiber-to-fiber joints.
   (b) What is the function of photo detector? Compare various photo detectors.

7 (a) What is the significance of system consideration in point-to-point fiber links? Explain.
   (b) What is the source of power penalty? Explain.

8 (a) Discuss the following optical coupler parameters:
        (i) Splitting ratio. (ii) Excess loss. (iii) Insertion loss. (iv) Cross talk.
   (b) For a 2 x 2 fiber coupler, input power is 200 μW, throughput power is 90 μW, coupled power is 85 μW and cross talk power is 6.3 μW. Compute the performance parameters of the fiber coupler.
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Code: 9A04702

B.Tech IV Year I Semester (R09) Regular & Supplementary Examinations December/January 2013/14
OPTICAL COMMUNICATIONS
(Electronics & Communication Engineering)

Time: 3 hours　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　Max. Marks: 70
Answer any FIVE questions
All questions carry equal marks
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1　(a)　Draw the block diagram of optical fiber communication system and explain about each block.
　(b)　An optical fiber in air has an NA 0.4. Compare the acceptance angle for meridional rays with that for skew rays which change direction by 100 degrees at each reflection.

2　(a)　Clearly explain the propagation modes in single-mode fibers.
　(b)　A single-mode fiber optical fiber has a beat length of 8 cm at 1300 nm. Determine modal birefringence (B_f) and birefringence(β).

3　(a)　What is material absorption? Explain about intrinsic and extrinsic absorption.
　(b)　The polarization mode dispersion in a uniformly birefringent single-mode fiber is 300 ps/km. Calculate the maximum bit rate that may be obtained on a 20 km repeater less link assuming only polarization mode dispersion to occur.

4　(a)　Explain about cylindrical and biconical ferrule connectors.
　(b)　A 32 x 32 port multimode fiber transmissive star coupler has 1 mW of optical power launched into a single input port. The average measured optical power at each output port is 14 μW. Calculate the total loss incurred by the star coupler and the average insertion loss through the device.

5　(a)　With the help of neat diagram, explain the following LED structures:
　　　　(i) Planar LED.　(ii) Dome LED.
　(b)　A DH surface emitter which has an emission area diameter of 50 μm is butt jointed to an 80 μm core step index fiber with a NA of 0.15. The device has a radiance of 30 Wsr^{-1} cm^{-2} at a constant operating drive current. Estimate the optical power coupled into the fiber if it is assumed that the Fresnel reflection coefficient at the index matched fiber surface is 0.01.

6　(a)　Discuss the various lensing schemes for coupling improvement.
　(b)　What is the temperature effect on avalanche gain? Explain.

7　(a)　Define CNR. Derive the mathematical form.
　(b)　Write short notes on multi-channel frequency modulation.

8　(a)　What is WDM? Explain the features of WDM.
　(b)　Briefly discuss 2 x 2 passive optical coupler.

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B.Tech IV Year I Semester (R09) Regular & Supplementary Examinations December/January 2013/14
OPTICAL COMMUNICATIONS
(Electronics & Communication Engineering)

Time: 3 hours   Max. Marks: 70

Answer any FIVE questions
All questions carry equal marks
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1   (a)   What are advantages of optical fiber communication? Explain clearly.
     (b)   A typical relative refractive index difference for an optical fiber designed for long distance
           communication is 1%. Estimate the NA and solid acceptance angle in air for the fiber when
           the core index is 1.46. Further, calculate the critical angle at the core-cladding interface
           within the fiber. It may be assumed that the concepts of geometric optics hold for the fiber.

2   (a)   Explain about glass fibers and plastic optical fibers.
     (b)   Explain the various mechanical properties of fibers.

3   (a)   What is linear scattering? Explain about Rayleigh and Mie scattering.
     (b)   A 3.5 km length of two polarization mode PM fiber has a polarization crosstalk of 27 dB at
           its output end. Determine the mode coupling parameter for the fiber.

4   (a)   What is fiber splices? Explain about Fusion and mechanical splices.
     (b)   A single mode fiber has the following parameters: Normalized frequency = 2.4, core
           refractive index = 1.46, core diameter = 8 μm and NA = 0.1. Estimate the total insertion loss
           of a fiber joint with a lateral misalignment of 1 μm and angular misalignment of 1 degree.

5   (a)   Write short notes on LASER diode modes.
     (b)   A ruby LASER containing a crystal length 4 cm with a refractive index of 1.78. The peak
           emission wavelength from the device is 0.55 μm. Determine the number of longitudinal
           modes and their frequency separation.

6   (a)   What is the source of power launching? Explain.
     (b)   What is detector response time? Explain.

7   (a)   With a neat block diagram explain multi-channel amplitude modulation.
     (b)   What are different elements of an angle link? Explain.

8   (a)   Explain the need of isolator in optical network. Give its principle of operation.
     (b)   Write short notes on fiber grating filters.

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B.Tech IV Year I Semester (R09) Regular & Supplementary Examinations December/January 2013/14
OPTICAL COMMUNICATIONS
(Electronics & Communication Engineering)

Time: 3 hours   Max. Marks: 70

Answer any FIVE questions
All questions carry equal marks
*****

1 (a) What is the concept of total internal reflection? Explain with a suitable optical cable setup.
   (b) A silica optical fiber with a core diameter large enough to be considered by ray theory analysis has a core refractive index of 1.5 and cladding refractive index of 1.47. Determine:
        (i) The critical angle at the core-cladding interface.
        (ii) The NA for the fiber.
        (iii) The acceptance angle in air for the fiber.

2 (a) Explain about MCVD and PCVD processes.
   (b) Write short notes on fiber optic cables.

3 (a) What is dispersion? Explain in detail.
   (b) Two polarization maintaining fibers operating at a wavelength of 1.3 μm have beat lengths of 0.7 mm and 80 m. Determine the model birefringence in each case and comment on the results.

4 (a) What is fiber joint? Explain about single and multimode fiber joints.
   (b) An optical fiber has a core refractive index of 1.5. Two lengths of the fiber with smooth and perpendicular (to the core axes) end faces are butted together. Assuming the fiber axes are perfectly aligned, calculate the optical loss in dB at the joint (due to Fresnel reflection) when there is a small air gap between the fiber end faces.

5 (a) What is threshold condition for LASER oscillation? Explain in detail.
   (b) The total efficiency of an injection LASER with a GaAs active region is 18%. The voltage applied to the device is 2.5 volts and the band gap energy for GaAs is 1.43 eV. Calculate the external power efficiency of the device.

6 (a) What is fiber splicing? Explain.
   (b) What are the physical principles of photo diode? Explain.

7 (a) Design an optical fiber link for transmitting 15 Mb/sec of data for a distance of 4 km with BER of 10^{-9}.
   (b) Write short notes on error control in digital link.

8 (a) What is an optical circulator? Explain in detail.
   (b) Explain the construction and applications of dielectric thin film filter.

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B.Tech IV Year I Semester (R09) Regular & Supplementary Examinations December/January 2013/14

RADAR SYSTEMS

(Electronics and Communication Engineering)

Time: 3 hours   Max. Marks: 70

Answer any FIVE questions
All questions carry equal marks

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1 (a) Derive the radar equation in terms of minimum detectable power and transmitting and receiving antenna gains.
   (b) Explain the operation of radar with neat block diagram.

2 (a) What is multiple-time around echoes? How they can be distinguished from unambiguous echoes?
   (b) Explain about false alarm time and probability.

3 (a) Explain the principle of operation of CW radar, with the help of neat block diagram.
   (b) List and explain the applications of CW radar.

4 (a) Explain how range and Doppler measurement are carried out using FMCW radar.
   (b) Explain the operation of sinusoidelly modulated FMCW radar.

5 (a) What is MTI radar? Explain its operation.
   (b) Explain the significance of delay line canceller in MTI radar.

6 (a) Explain about the target tracking using conical scanning with help of neat block diagram.
   (b) Compare the different trackers.

7 (a) Explain the efficiency of non-matched filters.
   (b) What is Schwartz inequality? How it is helpful in determining the response of the matched filter.

8   Write short notes on:
   (a) Duplexers.
   (b) Radar displays.

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B.Tech IV Year I Semester (R09) Regular & Supplementary Examinations December/January 2013/14
RADAR SYSTEMS
(Electronics and Communication Engineering)

Time: 3 hours   Max. Marks: 70

Answer any FIVE questions
All questions carry equal marks

*****

1 (a) Derive the radar equation.
  (b) List and explain some applications of radar.
  (c) What is the peak power of a radar whose average transmitter power is $200\,W$, pulse width of $1\,\mu s$ and a pulse repetition frequency of $1000\,Hz$.

2 (a) Discuss about the receiver noise and SNR, in detail.
  (b) Explain how true range can be measure from the range ambiguities.

3 (a) Derive the expression for Doppler frequency shift.
  (b) Explain how the isolation between transmitter and receiver can be achieved.

4 (a) Explain the principle of operation of FM-CW radar with neat block diagram.
  (b) Explain about the range measurement in FM-CW radar.

5 (a) Explain how moving targets can be distinguished from the stationary targets.
  (b) Compare and contrast the single and double delay line cancellers in MTI radar.

6 (a) Discuss about phase comparison mono-pulse technique for target tracking.
  (b) Explain the operation of conical scan with the help of neat block diagram.

7 (a) Show that matched filter forms the cross correlation between the received signal corrupted by noise and replica of the transmitted signal.
  (b) Briefly explain the non-white noise matched filter.

8 (a) Explain the different types of feeds used in phased array antennas.
  (b) Explain the different types of radar displays.

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B.Tech IV Year I Semester (R09) Regular & Supplementary Examinations December/January 2013/14

RADAR SYSTEMS

(Electronics and Communication Engineering)

Time: 3 hours   Max. Marks: 70

Answer any FIVE questions
All questions carry equal marks

*****

1 (a) Explain the different elements of radar block diagram.
   (b) List and explain the applications of radar.

2 (a) Explain the antenna losses of radar system.
   (b) Explain about the integration of radar pulses in detail.

3 (a) Explain the principle of Doppler effect and also explain how it is helpful in determining the velocity of the target.
   (b) Write note on receiver bandwidth requirements.

4 (a) Explain the characteristics of FM-CW radar in detail.
   (b) Describe the operation of multiple frequency CW radar.

5 (a) Explain the operation of MTI radar.
   (b) Write short notes on staggered PRF's.

6 (a) Explain the different types of tracking radar systems.
   (b) Write short note on acquisition and scanning patterns.

7 (a) Derive the frequency response function of the matched filter.
   (b) Write about cross correlation receiver.

8 (a) Obtain the expression for radiation pattern of phased array antennas.
   (b) Give the advantages and limitations of phased array antennas.

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B.Tech IV Year I Semester (R09) Regular & Supplementary Examinations December/January 2013/14

RADAR SYSTEMS

(Electronics and Communication Engineering)

Time: 3 hours   Max. Marks: 70

Answer any FIVE questions
All questions carry equal marks

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1 (a) Explain the following terms:
        (i) Range to a target.
        (ii) Maximum unambiguous range.
   (b) The radar operates at a frequency of $1300\,\text{MHz}$. Its maximum range is 200 nmi (nautican miles), for the detection of target with radar cross section of $1\,\text{m}^2$. Antenna dimensions are $12\,\text{m} \times 4\,\text{m}$, antenna aperture efficiency is 0.65. The receiver minimum detectable signal is 10^{-13}W. Determine:
        (i) Antenna effective aperture.
        (ii) Antenna gain.
        (iii) Peak transmitted power.

2 (a) What is meant by integration of radar pulses? Compare various methods.
   (b) Explain about the radar cross section of spherical targets.

3 (a) With a neat block diagram, explain the operation of CW radar.
   (b) Explain the CW Doppler radar with non-zero IF receiver.

4 (a) Explain the effect of operating wavelength on radar range with necessary mathematical expressions.
   (b) Write short notes on FM-CW altimeter.

5 (a) Explain the principle of operation of MTI radar with the help of neat block diagram.
   (b) Compare and contrast MTI and pulse Doppler radars.

6 (a) Explain the amplitude comparison mono pulse tracking technique.
   (b) Write short notes on tracking in range.

7 (a) Find the response of the matched filter.
   (b) Compare the efficiency of matched and non-matched filters.

8 (a) With necessary mathematical expressions, explain about receiver noise figure.
   (b) Write short notes on circulators.

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B.Tech IV Year I Semester (R09) Regular & Supplementary Examinations December/January 2013/14
T.V. ENGINEERING
(Electronics and Communication Engineering)

Time: 3 hours

Max. Marks: 70

Answer any FIVE questions
All questions carry equal marks

*****

1 (a) Draw the block diagram of a monochrome television transmitter. Explain its working.
  (b) Discuss about the geometric form and aspect ratio of television picture.

2 (a) Explain about the positive and negative modulation.
  (b) Write short notes on sound signal transmission.

3 (a) Discuss the production of video signal by photoemission method.
  (b) Write short notes on portable cameras.

4 (a) Draw the complete functional diagram of monochrome picture tube. Explain the processes of electrostatic focusing and electromagnetic deflection.
  (b) What are color TV standards?

5 (a) Draw the block diagram of sound section of monochrome receiver. Explain in detail.
  (b) Explain about sync separator and processing.

6 (a) What is AGC? Explain. List out the various advantages of AGC.
  (b) Draw the functional diagram of video, sound take-off and detection circuit in a color receiver. Explain.

7 (a) Draw the block diagram of PAL-D decoder. Explain.
  (b) What is the function of color-killer circuit? Explain in detail.

8 (a) Draw the sync separator circuit using transistor. Explain the operation with the help of waveforms.
  (b) What is AFC? Explain in detail.

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B.Tech IV Year I Semester (R09) Regular & Supplementary Examinations December/January 2013/14

T.V. ENGINEERING

(Electronics and Communication Engineering)

Time: 3 hours
Max. Marks: 70

Answer any FIVE questions
All questions carry equal marks

*****

1 (a) Draw the block diagram of black and white television receiver. Explain its working.
   (b) What is image continuity? Explain.

2 (a) What is meant by standard channel bandwidth? Explain.
   (b) Write short notes on VSB transmission.

3 (a) Discuss the production of video signal by photoconduction method.
   (b) Write short notes on studio cameras.

4 (a) What are specifications of picture tube? Explain in detail.
   (b) Write short notes on color picture tubes.

5 (a) Draw the block diagram of video amplifier in a B & W receiver. Explain in detail.
   (b) Explain about chrome decoder.

6 (a) Draw the basic AGC circuit. Explain in detail.
   (b) Discuss about color receiver IF subsystem.

7 (a) Draw a two stage chroma signal amplifier. Explain in detail.
   (b) What is color burst separation? Explain in brief.

8 (a) Discuss about the separation of frame and line sync pulses.
   (b) Write short notes on deflection oscillators.

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B.Tech IV Year I Semester (R09) Regular & Supplementary Examinations December/January 2013/14

T.V. ENGINEERING

(Electronics and Communication Engineering)

Time: 3 hours

Max. Marks: 70

Answer any FIVE questions

All questions carry equal marks

*****

1 (a) What is interlaced scanning? Explain in detail.
(b) Discuss the Grassman's law in detail.

2 (a) Explain about the dipole panel antenna system.
(b) What are different channels used in TV broadcasting? Explain.

3 (a) Draw the cross sectional view of vidicon camera. Explain in detail.
(b) Write short notes on color cameras.

4 (a) What are the characteristics of American 525 line B & W TV system? Explain.
(b) Write short notes on NTSC color system.

5 (a) What are the various sections of IF subsystem? Explain in detail.
(b) Briefly explain about PAL-D color receiver.

6 (a) What is FM detection? Explain the detection principle.
(b) Write short notes on digital tuning techniques.

7 (a) Draw the basic circuit for separating U and V signals. Explain its operation.
(b) What is the function of AGC amplifier? Explain.

8 (a) Explain about digital TV receiver.
(b) Write short notes on deflection drive IC's.

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B.Tech IV Year I Semester (R09) Regular & Supplementary Examinations December/January 2013/14
T.V. ENGINEERING
(Electronics and Communication Engineering)

Time: 3 hours   Max. Marks: 70

Answer any FIVE questions
All questions carry equal marks

*****

1 (a) What is resolution? Explain about vertical and horizontal resolution.
   (b) Explain about luminance and color difference signals.

2 (a) What is turnstile array? Explain.
   (b) Explain the following:
              (i)   Line of sight propagation
              (ii) Booster stations

3 (a) Draw the functional block diagram of a monochrome TV camera. Explain its operation.
   (b) Write short notes on Silicon diode array vidicon.

4 (a) What are the characteristics of American 625 line monochrome system? Explain.
   (b) Write short notes on PAL color system.

5 (a) What are the various sections of RF tuner? Explain in detail.
   (b) Briefly explain about chroma decoder.

6 (a) What is FM sound detection? Explain in detail.
   (b) What is TV receiver tuner? Explain tuner operation.

7 (a) Draw the burst phase discriminator circuit. Explain in brief.
   (b) What is the function of reference oscillator? Explain in brief.

8 (a) Explain about digital terrestrial TV.
   (b) Discuss about the separation of frame and line sync pulses.

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