

8E4088	Roll No. _____	Total No of Pages: <span style="border: 1px solid black; padding: 0 5px;">2</span>
<p style="font-weight: bold; font-size: 1.2em;">8E4088</p> <p style="font-weight: bold;">B. Tech. VIII Sem. (Main/Back) Exam., April, 2015</p> <p style="font-weight: bold;">Electronics &amp; Communication Engineering</p> <p style="font-weight: bold;">8EC1 Computer Networks</p>		

**Time: 3 Hours**

**Maximum Marks: 80**

**Min. Passing Marks: 24**

**Instructions to Candidates:**

*Attempt any five questions, selecting one question from each unit. All questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

*Units of quantities used/calculated must be stated clearly.*

*Use of following supporting material is permitted during examination.*

1. NIL

2. NIL

### **UNIT – I**

Q.1 Define birth and death process. Obtain its steady state probabilities. How it could be used to find the steady state solution for the M/M/1 model? [16]

#### **OR**

Q.1 (a) Explain how queuing theory could be used to study computer networks. [8]

(b) Find the steady state solution for the multiserver M/M/C model and hence find  $L_g$ ,  $W_g$ ,  $W_s$  and  $L_s$  by using Little formula. [8]

### **UNIT – II**

Q.2 (a) What is the difference between Internet architecture and OSI architecture? [8]

(b) Write short note on error detection and correction? Show how the following data 0001111111001111101000 would change when bit stuffing is applied on it. [8]



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**OR**

- Q.2 (a) What are the responsibilities of data link layer? Explain the different approaches of framing. [12]
- (b) Discuss simplex stop and wait protocol. [4]

**UNIT – III**

- Q.3 Describe the FDDI frame format and explain. Write the advantages of FDDI over a basic token ring. [16]

**OR**

- Q.3 (a) Name the four basic network topologies and explain them giving all the relevant features. [8]
- (b) Explain the working of ALOHA and SLOTTED ALOHA. [8]

**UNIT – IV**

- Q.4 (a) Explain the TCP transmission policy, congestion control. [8]
- (b) Explain the building and distribution of link state packets in link state routing algorithms. [8]

**OR**

- Q.4 (a) Explain a congestion control algorithm for TCP/IP networks. [8]
- (b) Explain OSPF with suitable illustration. [6]
- (c) Why is adaptive routing superior to non adaptive routing? [2]

**UNIT – V**

- Q.5 Diagrammatically illustrate and discuss the ATM architecture. [16]

**OR**

- Q.5 (a) What is the need for frame relay? How does it differ from conventional packet switching? What are the functions of its layers? [8]
- (b) How does ATM achieve high speed switching? And how congestion is controlled in ATM networks? [8]



8E4089	Roll No. _____	Total No of Pages: <span style="border: 1px solid black; padding: 0 5px;">4</span>
<p style="font-weight: bold; font-size: 1.2em;">8E4089</p> <p style="font-weight: bold;">B. Tech. VIII Sem. (Main/Back) Exam., April, 2015</p> <p style="font-weight: bold;">Electronics &amp; Communication Engineering</p> <p style="font-weight: bold;">8EC2 Radar &amp; TV Engineering</p>		

**Time: 3 Hours**

**Maximum Marks: 80**

**Min. Passing Marks: 24**

*Instructions to Candidates:*

*Attempt any five questions, selecting one question from each unit. All questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

*Units of quantities used/calculated must be stated clearly.*

*Use of following supporting material is permitted during examination.*

1. NIL

2. NIL

## UNIT – I

- Q.1 (a) Derive the basic radar range equation, as governed by the minimum receivable echo power  $P_{\min}$ . [8]
- (b) Calculate the maximum range of a radar system which operates at 3 cm with a peak pulse power of 500 kW, if its minimum receivable power is  $10^{-13}$  W, the capture area of its antenna is  $5\text{m}^2$ , and the radar cross-sectional area of the target is  $20\text{m}^2$ . [8]



**OR**

- Q.1 (a) With the aid of a block diagram, explain fully the operation of an MTI system using a power amplifier in the transmitter. [8]
- (b) An MTI radar operates at 5GHz, with a pulse repetition frequency of 800 pps. Calculate the lowest three blind speeds of this radar. [8]

## **UNIT – II**

- Q.2 (a) Draw the automatic direction finder for aircrafts and explain its working. [8]
- (b) Describe the instrument landing systems. [8]

**OR**

- Q.2 (a) Describe the long range navigation and their classification. [8]
- (b) What is tactical air navigation? Draw the radiation pattern for TACAN and waveform of detector output in the on board TACAN receiver. [8]

## **UNIT – III**

- Q.3 (a) What do you understand by interlaced scanning? Show that it reduces flicker and conserve bandwidth. [8]
- (b) What do you understand by active and blanking periods in horizontal and vertical scanning? Give the periods of nominal, active and retrace intervals of horizontal and vertical scanning as used in the 625 line system. [8]



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**OR**

Q.3 (a) Sketch the details of horizontal blanking and sync pulses. Label on it-

- (i) front porch
- (ii) horizontal sync pulse
- (iii) back porch
- (iv) active line periods.

Why are the front porch and back porch intervals provided before and after the horizontal sync pulse? Explain why the blanking pulses are not used as sync pulses. [8]

- (b) Sketch the sectional view of a picture tube that employs electrostatic focusing and electromagnetic deflection and label all the electrodes. Also show with a circuit diagram how DC potentials are supplied to the various electrodes of the picture tube. [8]

### **UNIT – IV**

- Q.4 (a) Describe the vestigial side band transmission. Sketch and fully label the desired response of a TV receiver that includes necessary correction on account of the discrepancy caused by VSB transmission. Comment on the response curve drawn by you. [8]



- (b) Draw a block diagram to show how the video signal is modulated and processed at the picture transmitter. Why is high level modulation not used in a TV transmitter? [8]

**OR**

- Q.4 (a) What are the special requirements of a fringe area television antenna and how are these achieved? Give constructional details of a typical fringe area antenna and explain the precautions that must be taken while mounting it. [8]
- (b) Describe with suitable sketches various types of lead-in wires used for connecting the antenna to the TV receiver. What is the essential difference between balanced and unbalanced lines and how are they connected to the receiver? Why is a coaxial cable preferred for connecting a UHF antenna? [8]

### **UNIT – V**

- Q.5 (a) Draw the functional block diagram of TV receiver and explain it. [8]
- (b) What are the essential requirements that a video amplifier must meet for faithful reproduction of picture details. [8]

**OR**

- Q.5 Write short notes on following: [4×4=16]
- (a) EHT generation
  - (b) HDTV
  - (c) DBS-TV
  - (d) 3D-TV

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8E4090	Roll No. _____	Total No of Pages: <span style="border: 1px solid black; padding: 0 5px;">4</span>
<p style="font-weight: bold; font-size: 1.2em;">8E4090</p> <p style="font-weight: bold;">B. Tech. VIII Sem. (Main/Back) Exam., April, 2015</p> <p style="font-weight: bold;">Electronics &amp; Communication Engineering</p> <p style="font-weight: bold;">8EC3 Optical Communication</p>		

**Time: 3 Hours**

**Maximum Marks: 80**

**Min. Passing Marks: 24**

*Instructions to Candidates:*

*Attempt any five questions, selecting one question from each unit. All questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

*Units of quantities used/calculated must be stated clearly.*

*Use of following supporting material is permitted during examination.*

1. NIL

2. NIL

## UNIT – I

- Q.1 (i) Describe the techniques employed and the fiber structures utilized to provide-[10]
- (a) Dispersion – shifted single mode fiber
  - (b) Dispersion – flattened single mode fiber
- (ii) A multimode graded index fiber exhibits total pulse broadening of  $0.1 \mu\text{s}$  over a distance of 15 km. Estimate- [6]
- (a) The maximum possible bandwidth on the link assuming no inter-symbol interference.
  - (b) The pulse dispersion per unit length.



**OR**

- Q.1 (a) Briefly explain the various factors contributing to dispersion. [6]
- (b) Explain Material dispersion and Waveguide dispersion. [6]
- (c) When the mean optical power launched into an 8 km length of fiber is  $120\mu\text{W}$ , the mean optical power at the fiber output is  $3\mu\text{W}$ . Determine - [4]
- (i) Overall signal attenuation
- (ii) The signal attenuation per kilometer for the fiber.

**UNIT - II**

- Q.2 (a) Explain the quantum efficiency of LED and external quantum efficiency of Laser. [8]
- (b) A double heterojunction in GaAsP LED emitting at a peak wavelength of 1310 nm has radiative and non-radiative recombination times of 30 and 100 ns, respectively. The drive current is 40 mA. Calculate - [8]
- (i) Internal quantum efficiency
- (ii) Optical power generated internally.

**OR**

- Q.2 (a) Discuss the Buried - heterostructure laser diodes for short wave length (GaAlAs) and long wave length (In GaAsP). [8]
- (b) Write Laser diode rate equation. [8]



### UNIT – III

Q.3 (a) A photo diode has a quantum efficiency of 65% when photons of energy  $1.5 \times 10^{-19}$  J are incident upon it. [8]

- (i) At what wavelength is the photodiode operating?
  - (ii) Calculate the incident optical power required to obtain a photocurrent of  $2.5 \mu\text{A}$  when the photo diode is operating as above.
- (b) Draw the block diagram of optical receiver and explain the fundamental concept of coherent light wave system. [8]

### OR

Q.3 (a) Discuss the following in brief. [12]

- (i) Detector response time
  - (ii) Avalanche multiplication noise.
- (b) If the photodiode capacitance is 3PF, the amplifier capacitance is 4 PF, the load resistor is  $1\text{K}\Omega$  and the amplifier resistance is  $1\text{M}\Omega$ , find the circuit bandwidth. [4]

### UNIT – IV

- Q.4 (a) Draw the schematic diagram of a light source coupled to an optical fiber and calculate the maximum optical power coupled into fiber. [10]
- (b) A GaAs optical source with a refractive index of 3.6 is coupled to a silica fiber that has a reflective index of 1.48. If the fiber end and the source are in close physical contact, calculate power loss 'L' in decibels. [6]



**OR**

- Q.4 (a) Write some principal requirements of a good connector design and explain the different optical fiber connectors. [8]
- (b) Explain the losses caused by longitudinal, lateral and angular displacement in splicing of fibers. [8]

**UNIT – V**

Q.5 Explain with a neat diagram-

- (i) Time domain intermodal dispersion measurement technique [6]
- (ii) Frequency domain intermodal dispersion measurement [5]
- (iii) Chromatic dispersion measurement [5]

**OR**

- Q.5 (a) Discuss the cut back technique of attenuation measurement with diagram. Also state the merits and demerits of it. [8]
- (b) Briefly explain the measurement of numerical aperture of optical fibers. [8]
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8E4094

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Total No of Pages: **4**

**8E4094**

**B. Tech. VIII Sem. (Main/Back) Exam., April, 2015**

**Electronics & Communication**

**8EC4.3 Microcontroller & Embedded Systems**

**Time: 3 Hours**

**Maximum Marks: 80**

**Min. Passing Marks: 24**

*Instructions to Candidates:*

*Attempt any five questions, selecting one question from each unit. All questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

*Units of quantities used/calculated must be stated clearly.*

*Use of following supporting material is permitted during examination.  
(Mentioned in form No. 205)*

1. NIL

2. NIL

### **UNIT – I**

- Q.1 (a) Write the basic characteristics for a CPU to be classified as a microcontroller. [4]  
(b) What is PSW register? Explain the function of individual bits of the PSW register. [6]  
(c) What are the alternate functions of the pins of port 3 of 8051 microcontroller? [6]

### **OR**

- Q.1 (a) Explain why microcontroller is suitable for design and development of embedded systems. [4]  
(b) Explain the RAM structure of 8051 microcontroller. [6]  
(c) What are different register banks available in 8051 microcontroller? What is the default register bank and how do you switch between different register banks. [6]



## UNIT - II

- Q.2 (a) What is the use of following directives in 8051:- [6]
- (i) ORG,
  - (ii) EQU,
  - (iii) END,
  - (iv) DB
- (b) Why 8051 is called a Boolean Processor? What is the difference between RET and RETI instruction? [4]
- (c) Write a program in 8051 assembly language to add the first ten natural numbers. [6]

### OR

- Q.2 (a) What is the difference between LJMP and SJMP instructions, LCALL and ACALL instructions? [4]
- (b) Write a program to - [6]
- (i) Load the accumulator with the value 55H, and
  - (ii) Complement the accumulator 500 times.
- (c) Write a program to determine if the content of R0 is FFH. If so, move FFH to R5. [6]



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## UNIT – III

- Q.3 (a) How many interrupts are there in 8051? What is the default priority of the interrupts? [4]
- (b) Write the function of the individual bits of the TMOD register. [6]
- (c) With a frequency of 22 MHz, generate a frequency of 100 KHz on pin 2.3. Use timer 1 in mode 1. [6]

### OR

- Q.3 (a) What is the use of GATE bit of TMOD register? What is the software method for starting and stopping the timer system of 8051? [6]
- (b) Write the function of the individual bits of the IE register. [6]
- (c) What is the counter system of 8051? Write one application where the counter system may be used. [4]

## UNIT – IV

- Q.4 (a) Draw the schematic and explain the method of interfacing a matrix keyboard with 8051 microcontroller. [8]
- (b) What is the difference between interrupt driven input/output and polling method of input/output? Which method is preferable? [4]
- (c) Write the function of TI and RI flag of SCON register. [4]



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**OR**

- Q.4 (a) Draw the schematic and explain the method of interfacing a LCD display with 8051 microcontroller. [8]
- (b) Draw the schematic and explain the method of interfacing an A/D converter with 8051. [8]

**UNIT – V**

- Q.5 (a) What are the various scheduling techniques used in operating systems? Explain any two. [8]
- (b) What do you understand by multitasking in operating systems? How is it achieved? [8]

**OR**

- Q.5 (a) List three ways in which an RTOS handles the ISRs in an multitasking environment. [8]
- (b) What is unique feature of Linux device drivers? How does Linux schedule the tasks? Why is this feature highly useful in an embedded system? [8]
-



8E4096	Roll No. _____	Total No of Pages: <span style="border: 1px solid black; padding: 0 5px;">3</span>
<p style="font-size: 18pt; font-weight: bold;">8E4096</p> <p style="font-size: 14pt; font-weight: bold;">B. Tech. VIII Sem. (Main/Back) Exam., April, 2015</p> <p style="font-size: 14pt; font-weight: bold;">Electronics Instrumentation &amp; Control</p> <p style="font-size: 14pt; font-weight: bold;">8EI1 Instrumentation in Industries</p> <p style="font-size: 14pt; font-weight: bold;">Common in 8EI1 &amp; 8AI1</p>		

**Time: 3 Hours**

**Maximum Marks: 80**

**Min. Passing Marks: 24**

*Instructions to Candidates:*

*Attempt any five questions, selecting one question from each unit. All questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

*Units of quantities used/calculated must be stated clearly.*

*Use of following supporting material is permitted during examination.*

1. NIL

2. NIL

### UNIT – I

- Q.1 (a) Draw and explain the man power distribution curve for process industries. [8]
- (b) Explain the term specialized process plant instrumentation with suitable examples. [8]

### OR

- Q.1 (a) Explain instrument department functions and responsibilities with the help of organizational chart in process plant instrumentation. [8]
- (b) Discuss about the major areas of power plant training for process industries. [8]



## UNIT – II

- Q.2 (a)** Draw and explain the C & I of Reactor Temperature control with recirculation.[8]  
**(b)** Draw and explain the C & I of cascade temperature control with heating and cooling capability for chemical reactors. [8]

### OR

- Q.2 (a)** Explain and draw C&I of Reactor Pressure Control by modulating gas make up. [8]  
**(b)** Explain the continuous control of Reactor Pressure with suitable example. [8]

## UNIT – III

- Q.3 (a)** Explain the control schemes of pumping traps of heat exchangers. [8]  
**(b)** Explain the C&I of by-pass control of steam heated exchanger with neat sketch. [8]

### OR

- Q.3 (a)** Explain the control schemes of Temperature-pressure cascade control loop on steam heaters. [8]  
**(b)** Discuss about the C&I of steam trap replaced by level control of steam heated exchangers. [8]

## UNIT – IV

- Q.4** Explain the following control loops with neat sketches.  
**(a)** C & I of forced circulation evaporators. [8]  
**(b)** C & I of long tube vertical evaporators. [8]



**OR**

**Q.4 Explain the following control loops with neat sketches.**

- (a) Draw and explain the C & I of pressure control of centrifugal pumps. [8]**
- (b) C & I of Horizontal tube evaporators. [8]**

**UNIT - V**

- Q.5 (a) Explain the control schemes of interlocking for steam power plants with suitable examples. [8]**
- (b) Discuss about the data logging and computing equipments. [8]**

**OR**

- Q.5 (a) Explain the C & I of feed water control for steam power plants. [8]**
- (b) Discuss about the primary and secondary power plant measurements & controls. [8]**

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<p><b>8E4098</b></p> <p><b>B. Tech. VIII Sem. (Main/Back) Exam., April, 2015</b></p> <p><b>Electronics Instrumentation &amp; Control</b></p> <p><b>8EI3 Distributed Control System &amp;</b></p> <p><b>Communication Protocols</b></p>		

**Time: 3 Hours**

**Maximum Marks: 80**

**Min. Passing Marks: 24**

*Instructions to Candidates:*

*Attempt any five questions, selecting one question from each unit. All questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

*Units of quantities used/calculated must be stated clearly.*

*Use of following supporting material is permitted during examination. (Mentioned in form No. 205)*

1. NIL

2. NIL

### **UNIT – I**

Q.1 What is meant by plant automation? Explain the distributed control systems and subsystems in detail. [16]

**OR**

Q.1 Explain the concept of centralized and distributed controls. Also, explain the integration of DPCS system with PLCS and computers. [16]

### **UNIT – II**

Q.2 Explain in detail the followings for DPCS system: -

- (i) System architecture [4]
- (ii) Data base organization [4]
- (iii) DPCS elements [4]
- (iv) Different DPCS systems [4]



**OR**

**Q.2** For the DPCS systems, explain the followings: -

- (a) Work stations and its key functions. [8]
- (b) Configuration of the control unit and different I/P, O/P and memory cards. [8]

**UNIT – III**

**Q.3** Explain the followings DCS displays and compare them: -

- (i) Graphic display [4]
- (ii) Loop display [4]
- (iii) Tuning display [4]
- (iv) Alarm display [4]

**OR**

**Q.3** Explain the followings in detail: -

- (i) Various requirements of communication network. [8]
- (ii) ISO reference model. [8]

**UNIT – IV**

**Q.4** What is meant by field bus standardization? Also, compare the following types of buses: - [16]

- (i) MODBUS
- (ii) PROFIBUS
- (iii) FIPBUS



**OR**

**Q.4 Explain the followings in detail: -**

- (i) LAN and Optical LAN in DCS. [8]**
- (ii) IEF E project 802 on LAN implementation. [8]**

**UNIT - V**

**Q.5 Explain the sequential and distributed controls in detail. Also, explain the various functions of DCS control. [16]**

**OR**

**Q.5 Write short notes on: -**

- (i) Feedback control builder [8]**
  - (ii) Batch system builder. [8]**
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8E4100

Roll No. \_\_\_\_\_

Total No of Pages: 2**8E4100**

**B. Tech. VIII Sem. (Main/Back) Exam., April, 2015**  
**Applied Electronics & Instrumentation Engineering**  
**8AI4.2 Operating Systems**  
**Common for 8EI4.3**

**Time: 3 Hours****Maximum Marks: 80****Min. Passing Marks: 24***Instructions to Candidates:*

*Attempt any **five** questions, selecting **one** question from each unit. All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

*Units of quantities used/calculated must be stated clearly.*

*Use of following supporting material is permitted during examination.  
 (Mentioned in form No. 205)*

1. NIL2. NIL**UNIT – I**

Q.1 Define following:-

- |                       |     |
|-----------------------|-----|
| (a) Batch Processing  | [4] |
| (b) Multi programming | [4] |
| (c) Time Sharing      | [4] |
| (d) Multi Tasking     | [4] |

**OR**

- |   |     |
|---|-----|
| Q.1 (a) What do you understand by term Shell & Kernel in UNIX? Explain. | [8] |
| (b) Explain file System in Window Operating System.                     | [8] |

**UNIT – II**

- |  |     |
|--|-----|
| Q.2 (a) What do you understand by Process Control Block? Explain.                            | [8] |
| (b) What do understand by Scheduling? Explain any three Scheduling algorithms with examples. | [8] |



OR

- Q.2 (a) What do you understand by Semaphores? Explain Dining - Philosopher Problem. [8]
- (b) Write a short note on Synchronization. [8]

UNIT - III

Q.3 Define following:-

- (a) Swapping [4]
- (b) Spooling [4]
- (c) Thrashing [4]
- (d) Segmentation [4]

OR

- Q.3 (a) What is Demand Paging? Explain. [8]
- (b) What do you understand by page Fault? Explain various page replacement algorithms with an example each. [8]

UNIT - IV

- Q.4 (a) What are various access methods of a file? Explain. [8]
- (b) Write a short note on free - space management. [8]

OR

Q.4 Write a short note on:-

- (a) User Authentication [8]
- (b) Logical structure of a directory. [8]

UNIT - V

- Q.5 (a) What is Deadlock? What are the necessary conditions for Deadlock? Explain. [8]
- (b) What is Resource allocation Graph? Explain. [8]

OR

- Q.5 (a) What is Banker's Algorithm for Deadlock avoidance? Explain with an example. [8]
- (b) Write a short note on Recovery for deadlock. [8]