

8E4088

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8E4088

B. Tech. VIII Semester (Main/Back) Examination-2014**Electronics & Communication.****8EC1 Computer Networks****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.)*

Unit - I

1. a) Differentiate Packet and circuit switching by taking important features one by one in a tabulated form. (8)
- b) In M/M/1 queuing system, calculate average waiting time of a packet in the queue (Time until the start of service to the packet). (8)

OR

1. a) Packets arrive at a router with mean arrival rate of 5 per second. The average packet length is 144 bytes and it is assumed that packet length is exponentially distributed. Line speed from the router to the WAN is 9600 bps. Calculate :
 - i) Mean No. of packets into the system
 - ii) Average time spent by packet in the system
 - iii) Calculate server utilization for lesser than four packets in the queue .
3+3+4=(10)
- b) Draw state transition diagram for M/M/m/m queuing system. Write flow Balance equation for the given queue. (6)

Unit - II

2. a) In a Go back 5 sliding Window protocol, Node A and Node B are under duplex transmission mode. Packets transmitted from Node B are 1.5 times

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bigger than packets transmitted from Node A. Discuss sliding window protocol for the case of transmission of packets from Node A and piggybacked ACK issuance from Node B. (Assume zero time out interval and zero transmission delay). (12)

- b) Discuss selective repeat ARQ protocol briefly. (4)

OR

2. a) Draw HDLC frame format and discuss about it briefly. (4)
b) Name the different types of frames for the central field of HDLC protocol. Discuss about these different types of frames by drawing their frame formats. (12)

Unit - III

3. a) Draw the frame format of IEEE 802.3 protocol and discuss about it. (8)
b) Discuss routing implementation in the Datagram subnet by taking a suitable example. (8)

OR

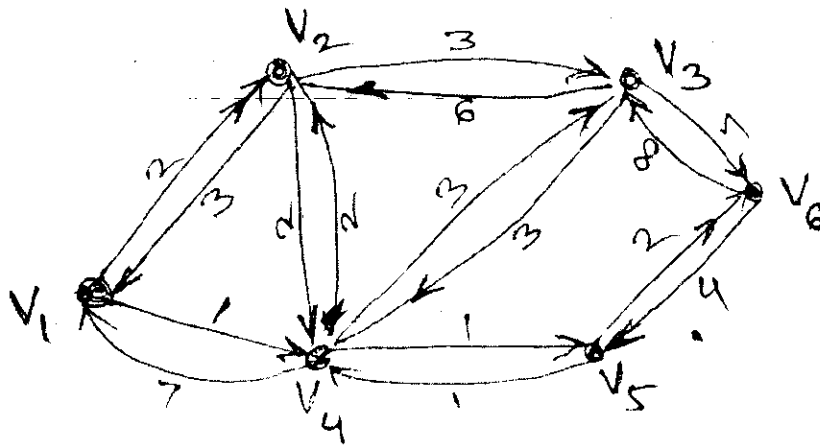
3. a) Compare different CSMA protocols by showing their throughput diagrams and discussing key features briefly. (10)
b) What do you understand by static and dynamic channel allocation? Classify same known ways of communication based on these two approaches. (6)

Unit - IV

4. a) Draw and discuss IPV 6 protocol header. (6)
b) What is the difference between a front address, a logical address, and a physical address? (6)
c) State the names of popular protocols used by Application layer, transport layer, and Network layer. (4)

OR

4. For a given weighted graph, calculate shortest path from vertex 1 to all other vertices by Dijkstra's Algorithm.



(16)

Unit - V

5. a) Discuss Role of address field in a virtual circuit network. (6)
- b) Discuss leaky Bucket algorithm for congestion control (10)

OR

5. a) Discuss important ATM service categories and state about their specific use. (8)
- b) Discuss the following ATM traffic descriptors.
- i) Sustainable cell rate
 - ii) Cell loss ratio
 - iii) Peak to peak cell delay variation
 - iv) Maximum burst size. (8)

8E4089

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8E4089

B. Tech. VIII Semester (Main/Back) Examination-2014

Electronics & Communication

8EC2 Radar & TV Engineering

Time : 3 Hours

Maximum Marks : 80

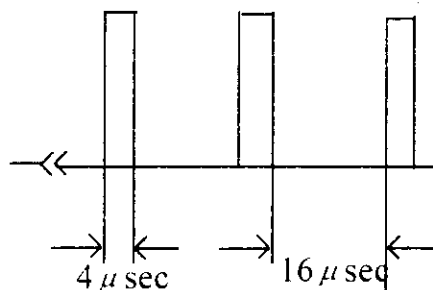
Min. Passing Marks : 24

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.)

Unit - I

1. a) A pulse radar sends following pulse streams with 2 MWatt Power



- i) Calculate its first four blind frequencies
- ii) Find the maximum range for it in noise free environment. (6×2=12)
- b) Draw the Block diagram of FMCW radar and enlist radar parameters Measured by it. (4)

OR

1. a) Explain the working of N-pulse delay line canceler and draw the frequency response of different pulse delay line cancelers for comparison. (8)
- b) Explain the effects of
 - i) Pulse shape
 - ii) Pulse repetition rate
 - iii) Antenna gain and
 - iv) Presence of clutter, on radar range. Also state the optimum condition for each. (4×2=8)

Unit - II

2. a) Find the time delay condition for LORAN to avoid ambiguity. What is the order or frequencies used in LORAN system? Justify the use of kilo Hz sample in long range radar system. (8+2+2=12)
- b) Write the name of all equipments used in DME. (4)

OR

2. a) Draw the Blockdiagram of an interrogator used in Air borne DME. Explain the role of distance circuits, ranging circuits and bearing circuits used in DME. (6+2+2+2=12)
- b) Explain the working of different Marker beacons used in radar Navigational aids. (4)

Unit - III

3. a) Define the following :
- Eye persistence
 - Interlace Scanning
 - Contrast
 - Flicker
 - Aspect ratio
 - Kell factor. (6×1=6)
- b) Calculate the vertical and Horizontal resolution for Indian TV system (625 line) If the beam diameter increase by 30% due to defocussing then calculate the degradation in resolution? (4+6=10)

OR

3. a) Calculate the frequency of Horizontal and vertical Saw tooth wave generator for
- 625 line system with 25 frames/second and 1 : 2 interlace ratio.
 - 525 line system with 30 frames/second and 1 : 2 interlace ratio
 - 625 line system with 25 frames/second and 1 : 3 interlace ratio. (3×3=9)
- b) Explain the provision for
- Pre and post Blanking pulse
 - Pedestal Height in composite video signal
 - Serrection of vertical sync pulse. (3×2=6)
- c) Draw the schematic of a CCD Camera. (1)

Unit - IV

4. a) Draw the vestigial side band transmission of first two channel in Band - III. Show the corresponding picture carrier, sound carrier and colour sub carrier frequencies. (3×2=6)
- b) Draw the frequency response of a TV receiver for receive vestigial side band transmission and explain how it resets the amplitude of low frequency video signals? (6)

- c) Explain the modulation scheme used for chrominance signal in 625-B system. (4)

OR

4. a) Justify the use of
- AM for video signal in TV
 - Exact difference of 4.433 MHz between picture carrier and colour sub carrier frequency
 - FM for sound signal in TV
 - Negative modulation scheme in TV. (4×3=12)
- b) Explain the reason for appear
- Ghost image
 - Horizontal white bar and
 - White spot or show on TV receiver. (3)
- c) Explain the compatibility of colour and b/w TV system. (1)

Unit - V

5. a) Draw the circuit diagram for
- H/v sync separator
 - AGC
 - Video detector
 - AFC
 - EHT generator
 - RF Tuner. (6×2=12)
- b) Compare HDTV with Normal TV receiver in terms of complexity and picture quality. (4)

OR

5. a) Explain the use of
- Delayed AGC
 - Simple diode detector
 - Pilot carrier scheme for colour sub-carrier signals
 - Quardture modulation in chrominance signal. (3×4=12)
- b) What is circuit diagram for
- Generate luminance signal
 - Automatic degaussing
 - Generation of colour - difference signal
 - Reproduction of V_G, V_R and V_B at receiver (4)

8E4090

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8E4090

B. Tech. VIII Semester (Main/Back) Examination-2014**Electronics & Communication****8EC3 Optical Communication****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.)

Unit - I

1. a) Explain step index fibres and graded index fibres with suitable diagrams, also give important expression related to them. (6)
- b) What is normalized frequency of fibre? Prove that $Mg = \frac{V^2}{4}$ for graded index fibre have parabolic profile, where Mg is the mode volume of graded index fibre and V is normalized Frequency. (6)
- c) The numerical aperture for a fibre is 0.352 and core diameter is $50 \mu m$ with light wavelength of $0.8 \mu m$. Calculate number of modes. (4)

OR

1. a) Discuss the signal distortion caused by inter modal and intra model dispersion. Distinguish their characteristics. (8)
- b) A continuous 10Km long optical fibre link has a loss of 1.5 dB/km .
 - i) What is the minimum optical power level that must be launched into the fibre to maintain an optical power level of $0.3 \mu W$ at the receiving end.
 - ii) What is the required power if the fibre has a loss of 2.5 dB/km . (4×2)

Unit - II

2. a) What do you understand by a double heterostructure? Draw and explain surface and edge emitting DHHLED. (8)
- b) How does a Distributed feedback laser operate? What does DFB stands for? Distinguishing characteristic of this type of laser diode. (8)

OR

2. a) With the aid of suitable diagram, discuss the principles of operation of the injection laser. (8)
- b) Write notes on population inversion. Give difference between spontaneous and stimulated emission. (8)

Unit - III

3. a) Explain the "Impact ionization" in avalanche photodiode. Define photo multiplication factor and multiplication factor in reference to APD. (8)
- b) Compare p-n diode and Avalanche photodiode. (8)

OR

3. a) Discuss the fundamental of optical receiver. (4)
- b) Discuss the types of noises that come in action with a optical detector. (6)
- c) What is meant by SNR? Derive an expression for SNR for p-n photodiode and Avalanche photodiode. (6)

Unit - IV

4. a) Discuss about the three types of fibre alignments which may contribute to insertion loss at an optical fibre joint. (8)
- b) What are optical splices? Describe the different types of optical splicing used in optical communication. (8)

OR

4. a) Explain system requirements of fibre optic communication system design. (8)
- b) Discuss important components of WDM transmission system and their properties, also describe the classification of WDM systems. (8)

Unit - V

5. a) Explain different methods of measurement of total attenuation in optical fibre. (8)
- b) Explain methods of measurement of fibre dispersion using suitable diagram. (8)

OR

5. a) Explain different methods of measurement of refractive index profile of an optical fibre with suitable diagram. (8)
- b) Explain the method of measurement of Numerical aperture of an optical fibre. (8)
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8E4094	Roll No. _____	[Total No. of Pages : 2]
	8E4094	
	B. Tech. VIII Semester (Main/Back) Examination-2014 Electronics & Comm. 8EC4.3 Microcontroller and 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.)*

Unit - I

1. a) What is a bus cycle? If the internal bus width is 8, then explain why the 16-bit operation take two bus cycles?
- b) Internal buses are not serial buses, Explain? (8×2=16)

OR

1. a) Explain uses of the open-drain output and quasi open-drain output
- b) Explain how to obtain a real time clock in a system. (8×2=16)

Unit - II

2. a) Explain how will 8051 MCUs communicate the data on the common T×D and R×D lines in the inter-processor communication mode.
- b) How will you set watchdog timer to re-start the processor at every 2 seconds? (8×2=16)

OR

2. a) Why are the PUSH and POP important instruction when servicing the number of interrupt sources by their interrupt service routines.
- b) Write the reason for the SP pre-increment on a push and post-decrement on a POP in 8051. Note that default SP= 7FH. (8×2=16)

Unit - III

3. a) Explain how 8051 services an interrupt on its occurrence.
- b) How does 8051 processor generate the ISR address on an un-marked interrupt. (8×2=16)

OR

3. a) Explain four applications of real-time clock interrupts? How do the real-time clock interrupt in 6811 differ from the software timer interrupts in 80×96?

- b) Describe the concepts of interrupt intervals, interrupt density and interrupt constraints. (2×8=16)

Unit - IV

4. a) How will you interconnect the 8251 with a modem?
b) How will you inter connect the 8251 at the address F0000H and F001H? (8×2=16)

OR

4. a) How will you program the DMA address register and terminal count register of Ch0 and ch01?
b) How will you mask the IRQ3 and IRQ4 in 8259? (8×2=16)

Unit - V

5. Explain the application of micro controllers in Robotics with suitable system design. (16)

OR

5. What are commercial RTOS and discuss WINCE and Embedded Linux in brief. (16)
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8E4096	Roll No. _____	[Total No. of Pages : 2]
	8E 4096	
	B.Tech. VIII Semester (Main/Back) Examination - 2014 Applied Electronics & Instrumentation Engg. 8AI1 Instrumentation in Industries Common for 8EI1	

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.)*

Unit - I

1. a) What are different functions and responsibilities of instrumentation department in process industries? (8)
- b) Draw the chart of various levels and positions of different engineers and compare the role of process Instrumentation Engineer with them. (8)

OR

1. a) Discuss the role of instrumentation engineer in power plant industries. (8)
- b) Explain in detail that how standardization of instrumentation has lead to ease of operation and maintenance in process industries. (8)

Unit - II

2. a) Draw and explain C&I diagram for feed forward control system in heat exchanger. (8)
- b) Draw a C&I diagram and explain the pressure control through temperature is done if the reactor. (8)

OR

2. a) Draw a C&I diagram and explain recirculated cooling of chemical reactor which guarantees a constant and high rate of cooling water circulation. (8)

- b) Describe with C&I diagram for pressure compensated temperature control to improve speed response of chemical reactor. (8)

Unit - III

3. a) Draw and discuss C&I diagram for recirculating multipurpose heat transfer system which uses hot oil as its heat source and water as its coolant. (8)
- b) Explain with C&I diagram how the condensers can be controlled by refrigerant coolants. (8)

OR

3. a) Explain in detail with C&I diagram for reboiler operation in vacuum distillation operated at negative pressure. (8)
- b) Describe with C&I diagram the control scheme of distillation process for the purpose of vaporization at food. (8)

Unit - IV

4. a) Explain the process and instrumentation - control scheme for rotary dryer. (8)
- b) Describe with suitable diagram & instrumentation scheme of evaporator applied with selective control scheme. (8)

OR

4. a) List different types of dryers and explain heated cylinder type dryer control schemes. (8)
- b) Develop a steady state model for evaporator control. (8)

Unit - V

5. a) Describe the instrumentation & control schemes of food water control for a boiler. Also explain safety interlocks associated with it. (8)
- b) Explain the control scheme for maintaining the frequency of electrical power generated by steam power plant. (8)

OR

5. Draw a C&I diagram for boiler control in power-point. Also explain all the safety interlocks and explain boiler drum level control. (6,4,6)

8E4097

Roll No. _____

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8E4097

B. Tech. VIII Semester (Main/Back) Examination-2014**Electronics Instrumentation & Control****8EI2 Non Linear Control System****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.)

Unit - I

1. a) What are intentional and inherent nonlinearities.
- b) Clearly state how nonlinear systems are different from linear systems from following points of view.
 - i) Equilibrium points
 - ii) Limit cycles.
 - iii) stability analysis.

(6+10)**OR**

1. a) Explain the phase - plane method of analysis of second order non-linear systems what are the possible cases of phase portraits obtained with different nature of eigenvalues and comment upon their stability.
- b) What is iso-cline method of drawing phase-portrait.

(10+6)**Unit - II**

2. a) Explain the use of poicare index to establish the relation of nature of singular point and existence of limit cycle.
- b) For the following non-linear system determine the equilibria point and their stability.

(8+8)

$$\dot{x}_1 = -x_2 + (1 - x_2^3)x_1$$

$$\dot{x}_2 = x_1 + x_2^2 x_1$$

OR

2. a) Apply Bendixson's theorem for the non-linear system described by

$$\dot{x}_1 = (1 - x_1)^2 - x_2$$

$$\dot{x}_2 = x_1(1 - x_1)$$

to check the existence of limit cycle.

- b) Explain the idea of linearizing the non-linear system and hence give Jacobian matrices about the equilibrium point for the following system.

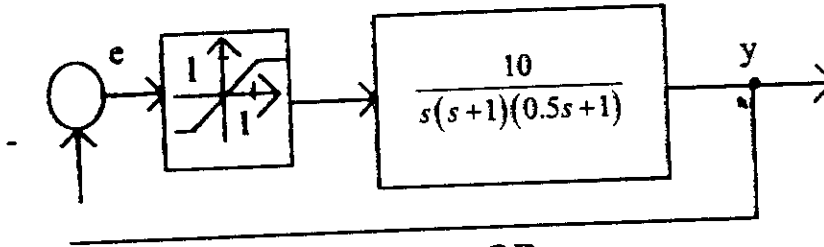
(8+8)

$$\dot{x}_1 = x_1 + x_2 - x_1(x_1^2 + x_2^2)$$

$$\dot{x}_2 = -3x_1 + x_2 - x_2(x_1^2 + x_2^2)$$

Unit - III

3. a) Explain Describing function analysis for non-linear systems.
 b) Consider the system shown in fig. below. using describing function analysis, investigate possibility of a limit cycle in the system. (8+8)



OR

3. Consider the following non-linear system.

$$\dot{x}_1 = -x_2 + ax_1x_2^2$$

$$\dot{x}_2 = x_1 - bx_1^2x_2 \text{ with } a \neq b$$

Investigate the stability of equilibrium point of the system. (16)

Unit - IV

4. Explain in detail the Lyapunov direct and indirect method of stability analysis of non-linear systems. (16)

OR

4. a) Using Lyapunov's method check for the stability of the following system.

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

$$\dot{x}_2' = -x_1 - x_2$$

choose $v(x) = x_1^2 + x_2^2$ as Lyapunov function.

- b) Investigate the stability of non-linear spring described by

$$\ddot{y} + 3\dot{y} + y^3 = 0$$

choose $v(x) = \frac{1}{4}x_1^4 + \frac{1}{2}x_2^2$ as Lyapunov function. (8+8)

Unit - V

5. Explain basic concepts of model-reference Adaptive control by drawing a block diagram. (16)

OR

5. Write short notes on (any two)

- a) Available methods of non-linear control Design.
 b) Systems with output feedback.
 c) Stabilization and tracking of control systems. (8 each)

8E4098	Roll No. _____	[Total No. of Pages : 2]
	8E 4098	
	B.Tech. VIII Semester (Main/Back) Examination - 2014 Electronics Instrumentation & Control 8EI3 Distributed Control System & Communication Protocols	

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.)

Unit - I

1. a) Explain computer system structure for a manufacturing complex. (8)
- b) Compare the centralized and distributed control concept. (8)

OR

1. a) Write down aims of plant automation and distributed computer control system. (8)
- b) Explain DPCS system configuration in brief. (8)

Unit - II

2. a) Explain data base organization. (8)
- b) Explain the configuration of control unit. (8)

OR

2. Explain work stations and its key functions and key chart. (16)

Unit - III

3. a) Explain the following of DCS display-
 - i) Ground display
 - ii) Graphic display (8)
- b) Explain the following of DCS display-
 - i) batch / sequence display
 - ii) loop display (8)

OR

3. a) Explain ISO reference modal. (8)
 b) What is Communication Hierarchy? Explain it in detail. (8)

Unit - IV

4. a) Explain the following-
 i) Transmission Media
 ii) Network topologies (8)
 b) Explain LAN in DCS. (8)

OR

4. a) Explain the following-
 i) Data transmission
 ii) FB standardization (8)
 b) Explain the following-
 i) HART protocol
 ii) Network structure (8)

Unit - V

5. Explain the following-
 i) Utility
 ii) Switch Instrument (16)

OR

5. Explain the following-
 i) Graphic builder
 ii) Feedback control builder. (16)

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	B.Tech. VIII Semester (Main/Back) Examination - 2014* Electronics Instrumentation & Control 8EI4.2 Operating Systems Common for 8AI4.2	

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.)

Unit - I

1. a) What is an operating system? Describe the role of an operating system as a resource manager. (8)
- b) Explain four major functions of operating system. (8)

OR

1. a) What are the main services of the operating system? (8)
- b) Explain the following terms:
 - i) Real time system
 - ii) Batch system
 - iii) Time sharing system. (8)

Unit - II

2. a) What is a process? How it changes its stages in system? (8)
- b) Describe the differences among short term, medium term and long term scheduling. (8)

OR

2. a) Draw the Gantt chart, using SJF scheduling for the given data. Also calculate the average waiting time.

Process	Burst time
P1	10
P2	03
P3	19
P4	82

(8)

- b) Explain semaphore. How can semaphore be used to enforce mutual exclusion?
Give a suitable example to explain. (8)

Unit - III

3. a) Describe these allocation algorithms:
i) Best fit
ii) First fit
iii) Worst fit (8)
b) What is paging? How is it different from segmentation? (8)

OR

3. a) What is thrashing? How can it be overcome? (8)
b) Discuss Elevator algorithm for disc scheduling with example. (8)

Unit - IV

4. a) Explain the following
i) File attributes
ii) File access (8)
b) Explain linked list allocation method of files. Write advantages of it over other methods. (8)

OR

4. a) Explain the difference between sequential, Indexed and Indexed sequential file. (8)
b) What are the different file organizations? Discuss access mechanisms. (8)

Unit - V

5. a) What is dead lock? Write the conditions for a dead lock. (8)
b) Explain safe and unsafe states with a suitable example. (8)

OR

5. a) What are the various ways to recovery from dead lock? (8)
b) Describe at least three measures, which can be used to prevent a dead lock condition. (8)