



# INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad - 500 043

## ELECTRONICS AND COMMUNICATION ENGINEERING

### QUESTION BANK

<b>Course Name</b>	: <b>Computer Organization and Operating Systems</b>
<b>Course Code</b>	: A50516
<b>Class</b>	: III B. Tech I Semester
<b>Branch</b>	: Electronics and Communication Engineering
<b>Year</b>	: 2017– 2018
<b>Course Faculty</b>	: Ms. A Swapna , Ms. A Lakshmi, Mr.Ch.Srikanth, Mr.P.Sunil Kumar Assistant Professor.

#### OBJECTIVES

To meet the challenge of ensuring excellence in engineering education, the issue of quality needs to be addressed, debated and taken forward in a systematic manner. Accreditation is the principal means of quality assurance in higher education. The major emphasis of accreditation process is to measure the outcomes of the program that is being accredited.

In line with this, Faculty of Institute of Aeronautical Engineering, Hyderabad has taken a lead in incorporating philosophy of outcome based education in the process of problem solving and career development. So, all students of the institute should understand the depth and approach of course to be taught through this question bank, which will enhance learner's learning process.

S. No	Questions	Blooms Taxonomy Level	Program Outcome
<b>Assignment Questions</b>			
<b>UNIT – I</b>			
1	<b>Explain</b> briefly about Basic Performance Equation.	Understand	2
2	<b>Explain</b> 2's Complement addition and Subtraction with numerical Examples.	Understand	2
3	<b>Discuss</b> briefly about Floating point Representation with Example.	Understand	5
4	<b>Discuss</b> Three-state Bus Buffers with neat Diagram	Understand	1
5	<b>Explain</b> Binary Adder- Sub tractor with Diagram in detail.	Understand	3
6	<b>Discuss</b> different applications of Logical micro-operations with Examples.	Understand	2
7	<b>Explain</b> different Shift Micro-operations with examples.	Understand	3
8	<b>Explain</b> the Arithmetic Logic Shift Unit with block diagram.	Understand	2
9	<b>Explain</b> different Phases of Instruction Cycle with Examples.	Understand	2
10	<b>Discuss</b> briefly about Program control along with interrupt Cycle.	Understand	3
11	<b>Explain</b> the following related to Stack Organization. a) Register Stack      b) Memory Stack	Understand	2
12	<b>Define</b> an instruction format? Explain different types of instruction formats in detail	Remember	1
13	<b>Explain</b> different types of addressing modes with Suitable examples	Understand	2

S. No	Questions	Blooms Taxonomy Level	Program Outcome
<b>Assignment Questions</b>			
14	<b>Show</b> how can the following operation be performed using: a- three address instruction b- two address instruction c- one address instruction d- zero address instruction  $X = (A + B) * (C + D)$	Application	4
15	<b>List</b> and explain different Data Transfer instructions.	Knowledge	2
16	<b>Calculate</b> the arithmetic operations $(+42) + (-13)$ and $(-42) - (-13)$ in binary using signed 2's complement representation for negative numbers.		3
17	<b>Calculate</b> the arithmetic operations $(+70) + (+80)$ and $(-70) + (-80)$ with binary numbers in signed 2's complement representation. Use eight bits to accommodate each number together with its sign. Show that overflow Occurs in both cases.	Knowledge	2
18	<b>Define</b> program interrupt? Explain External interrupts and internal interrupts.	Remember	1
19	<b>Explain</b> briefly about RISC architecture.	Understand	2
20	<b>Compare</b> the RISC and CISC architecture		4
<b>UNIT – II</b>			
1	<b>Explain</b> operation of control unit of basic computer with diagram.	Understand	4
2	<b>Explain</b> briefly about Address Sequencing in control memory.	Understand	3
3	<b>Draw</b> and Explain the Microinstruction Format.		4
4	<b>Explain</b> the following related to Address Sequencing. a)Conditional branching b)Mapping of Instruction	Understand	6
5	<b>Explain</b> the Organization of Hardwired control in detail.	Understand	7
6	<b>List</b> the differences between hardwired control and micro programmed control.	Knowledge	2
7	<b>Explain</b> the Organization of Micro programmed control unit in detail.	Understand	2
8	<b>Explain</b> briefly about Micro-program Sequencer with diagram.	Understand	1
9	<b>Explain</b> organization of a 1 K X 1 memory chip with neat diagram.	Understand	5
10	<b>Explain</b> i) ROM ii) PROM iii) EPROM iv) EEPROM.	Knowledge	4
11	<b>Discuss</b> Cache memories in detail	Analyze	3
12	<b>Define</b> a mapping function? Explain Associative mapping technique with its advantages and disadvantages?	Understand	2
13	<b>Explain</b> organization of a 1 K X 1 memory chip with neat diagram.	Understand	5
14	<b>Explain</b> the following Cache Mapping Techniques (a) Direct Mapping (b) Set Associative Mapping.	Understand	6
15	<b>Define</b> virtual memory? Explain with a diagram how virtual address can be mapped in to physical address using paging.	Remember	5
16	<b>Discuss</b> different RAID levels in detail with Diagrams	Understand	5
17	<b>Define</b> Page-fault? Explain the following page replacement algorithms with Examples a)FIFO b)LRU	Knowledge	4
18	<b>Discuss</b> different RAID levels with Necessary Examples.	Understand	5
<b>UNIT - III</b>			
1	<b>Explain</b> Strobe Control method of Asynchronous data transfer technique.	Understand	9
2	<b>Describe</b> Asynchronous serial transfer in detail.	Knowledge	4
3	<b>Discuss</b> First-In, First-Out Buffer with neat diagram.	Understand	6

S. No	Questions	Blooms Taxonomy Level	Program Outcome
<b>Assignment Questions</b>			
4	<b>Discuss</b> Handshaking method of Asynchronous data transfer technique?	Understand	2
5	<b>Explain</b> briefly about Asynchronous communication interface with diagram.	Understand	3
6	<b>Discuss</b> DMA transfer technique in detail with block diagram?	Understand	4
7	<b>Explain</b> the following a)CPU-IOP communication b)Daisy- Chaining priority c)Bit-oriented protocol	Understand	7
8	<b>Discuss</b> the Character-oriented Protocol with Example.	Understand	5
9	<b>Discuss</b> the following a) Parallel priority Interrupt. b)Priority Encoder	Understand	4
10	<b>Explain</b> briefly about DMA Controller with block diagram	Understand	3
11	<b>Explain</b> the operation of input output processor (IOP) with an example.	Understand	4
12	<b>Explain</b> different modes of Data Transfer to and From Peripherals	Understand	7
13	<b>Explain</b> 8089 Input-Output processor with necessary Diagram.	Understand	8
14	<b>Discuss</b> USB Serial communication protocol in detail.	Understand	3
15	<b>Explain</b> briefly about Input-output Processor with Diagram.	Understand	4
<b>UNIT – IV</b>			
1	<b>Describe</b> the operating system structures.	Knowledge	10
2	<b>Discuss</b> about the following structures of OS. a. Simple structures b. Layered approach c. Micro kernels	Understand	9
3	<b>Explain</b> briefly about System calls with Examples.	Understand	10
4	<b>Discuss</b> briefly about Swapping concept with necessary Examples.	Understand	11
5	<b>Describe</b> contiguous memory allocation concept with advantages and disadvantages.	Knowledge	12
6	<b>Compare</b> the main memory organization schemes of contiguous-memory allocation, segmentation, and paging with respect to the following issues: a. external fragmentation b. internal fragmentation c. ability to share code across processes	Understand	13
7	<b>Differentiate</b> between internal and external fragmentation. Which one occurs in paging scheme.	Understand	10
8	<b>Explain</b> briefly about Paging with neat diagram.	Understand	9
9	<b>Discuss</b> the following a)Hierarchical paging b)Inverted page Tables	Understand	10
10	<b>Draw</b> and explain the working procedure of paging hardware in detail.	Knowledge	11
11	<b>Explain</b> the basic concepts of segmentation with neat diagrams.	Understand	12
12	<b>Define</b> page fault? When does a page fault occur? Describe the action taken by OS when page fault occurs.	Remember	13
13	<b>State</b> and explain about Virtual memory concept with neat diagram.	Knowledge	10
14	<b>Explain</b> briefly about performance of Demand paging with necessary Examples.	Understand	10
15	<b>Explain</b> the basic Scheme of page replacement and about the various page replacement strategies with examples.	Understand	11

S. No	Questions	Blooms Taxonomy Level	Program Outcome																												
<b>Assignment Questions</b>																															
16	Consider the following page-reference string:  1,2,3,4,2,1,5,6,2,1,2,3,7,6,3,2,1,2,3,6 <b>Calculate</b> How many page faults would occur for the following replacement algorithms, assuming frame size is 4. Remember that frames are initially empty. (i)LRU replacement (ii)FIFO replacement (iii)Optimal replacement	Apply	10																												
17	<b>Define</b> thrashing? Explain the different methods to avoid thrashing.	Remember	9																												
18	<b>Explain</b> the Banker's algorithm for deadlock avoidance with Example.	Understand	10																												
19	<b>Discuss</b> deadlock detection in detail.	Understand	9																												
20	<b>State</b> and explain the methods involved in recovery from deadlocks	Knowledge	10																												
	Consider the following snapshot of a system:  <table style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th></th> <th style="text-align: center;">Allocation</th> <th style="text-align: center;">Max</th> <th style="text-align: center;">Available</th> </tr> <tr> <th></th> <th style="text-align: center;">A B C</th> <th style="text-align: center;">A B C</th> <th style="text-align: center;">A B C</th> </tr> </thead> <tbody> <tr> <td><math>P_0</math></td> <td style="text-align: center;">0 1 0</td> <td style="text-align: center;">0 0 0</td> <td style="text-align: center;">0 0 0</td> </tr> <tr> <td><math>P_1</math></td> <td style="text-align: center;">2 0 0</td> <td style="text-align: center;">2 0 2</td> <td></td> </tr> <tr> <td><math>P_2</math></td> <td style="text-align: center;">3 0 3</td> <td style="text-align: center;">0 0 0</td> <td></td> </tr> <tr> <td><math>P_3</math></td> <td style="text-align: center;">2 1 1</td> <td style="text-align: center;">1 0 0</td> <td></td> </tr> <tr> <td><math>P_4</math></td> <td style="text-align: center;">0 0 2</td> <td style="text-align: center;">0 0 2</td> <td></td> </tr> </tbody> </table> <p>Answer the following questions using the banker's algorithm: a. <b>Calculate</b> is the content of the matrix need? b. <b>Identify</b> the system in a safe state?</p>		Allocation	Max	Available		A B C	A B C	A B C	$P_0$	0 1 0	0 0 0	0 0 0	$P_1$	2 0 0	2 0 2		$P_2$	3 0 3	0 0 0		$P_3$	2 1 1	1 0 0		$P_4$	0 0 2	0 0 2		Apply	11
	Allocation	Max	Available																												
	A B C	A B C	A B C																												
$P_0$	0 1 0	0 0 0	0 0 0																												
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$P_4$	0 0 2	0 0 2																													
<b>UNIT - V</b>																															
1	<b>Discuss</b> File System implementation in detail with suitable diagrams	Understand	14																												
2	<b>Describe</b> the following most common schemes for defining the logical structure of a diagram <b>a)</b> Single-level directory <b>b)</b> Two-level directory	Knowledge	13																												
3	<b>Explain</b> briefly about Tree structured directories with diagram	Understand	11																												
4	<b>Define</b> mount point? Explain File system mounting in detail?	Knowledge	14																												
5	<b>Explain</b> briefly about Acyclic-Graph Directories structure with diagram	Understand	13																												
6	<b>Explain</b> in detail about File sharing and protection?	Understand	12																												
7	<b>Define</b> Directory? Explain General Graph directory Structure in detail?	Knowledge	14																												
8	<b>Define</b> File system? Explain Layered File system in detail?	Knowledge	13																												
9	<b>Explain</b> briefly about virtual File system with diagram?	Understand	12																												
10	<b>Discuss</b> Contiguous File Allocation method with suitable examples?		14																												
11	<b>Define</b> Free-Space list? Explain different implementation methods for free space management?	Knowledge	11																												
12	<b>Explain</b> briefly about Linked File Allocation method with example?	Understand	12																												
13	<b>Distinguish</b> between Contiguous and linked File allocation methods?	Understand	10																												
14	<b>Discuss</b> Indexed File Allocation methods with suitable examples?	Knowledge	14																												
15	<b>Discuss</b> the following a)File attributes b)File types c)Internal File structure	Knowledge	13																												

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