46th & 47th BCS Written Suggestions- CSE 971 & ICT 281

Operating System	Introduction, evolution, goals and components of OS. Types of OS Process management: Process states PCB, job and process scheduling. CPU scheduling algorithms, critical section problems and solutions. Semaphores, Inter-process communication techniques. Deadlock handling methods. Memory management techniques: Paging, segmentation and page replacement policies. Secondary storage management: Disk scheduling algorithms. File management: File system structure, organization, FCB, space allocation, tree structured file system. Protection and security: classification and handling techniques

Operating System

বিগত বিসিএস পরীক্ষায় আসা অপারেটিং সিস্টেম -এর প্রশ্নসমূহ

SL	Question
1	What is pipelining? How does pipeline implementation make faster instruction execution? [BCS – 38th(ICT)]
2	What are the steps that occur when an interrupt is processed? [BCS – 38th(ICT)]
3	What is operating system? Why do we need operating system? [BCS – 38th(ICT)]
4	What is deadlock? Describe the way of detecting and protecting deadlock. [BCS – 38th(ICT)]
5	(a)What is the difference between preemptive and non-preemptive scheduling (b) What is aging? Why it is used in OS ? [BCS – 37th(ICT)]
6	What is Race Condition? How to remove this ? [BCS – 36th(ICT)]
7	Explain how Parallel Processing does work? [BCS – 36th(ICT)]
8	What is interrupt Controller? [BCS – 36th(ICT)]
9	Explain Banker's Algorithm for Deadlock handling. [BCS – 36th(ICT)]
10	Distinguish between paging & Segmentation. [BCS – 36th(ICT)]
11	অপারেটিং সিস্টেম এ Deadlock এর সংজ্ঞা দিন। একটি Deadlock situation দেখানোর জন্য একটি সঠিক diagram অংকন করুন ও সংক্ষিপ্তভাবে আলোচনা করুন। ৪ [45th BCS]

সম্ভাব্য প্রশ্ন সাজেশন্স

SL	Question
1	What is boot loader? Why it is used?
2	Differentiate between multiprogramming and multi-processing.
3	What is semaphores? How readers writer problem can be solved with semaphore explain.
4	Why it is generally correct to favor I/O bound process over CPU.
5	Given an initial sets of batch jobs show that the shortest job first minimizes the turn-around time.
6	Why Page table is used in Operating System.
7	What are the difference between process and thread?
8	What are the steps that occur when an interrupt is processed?
9	What are the differences between process and thread?

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10	When is page fault occurred? Explain LRU algorithm for handling page fault.
11	What do you mean by virtual memory?
12	Explain Paging & Segmentation.
13	Scheduling Algorithm (FCFS, SJF, SRTF, RR, PS)
14	Page Replacement Algorithm (FIFO, LIFO, LRU)
15	Four Conditions of Deadlock, Shell & Kernel

Network Security	Network security: Types of attack, encryption techniques and digital signatures. ATM switches, ATM protocol; DNS, HTTP, Email.

Computer Security/Information Security

SL	Question
	What is cryptography and public key infrastructure are important? **[BCS – 37th(ICT)]**
	What is Digital Signature? How public key and private key encryption does? **[BCS – 36th(ICT)]**
	Describe DoS and Brute Force attack. **[BCS – 36th(ICT)]**
	Virus, worms এবং trojan horse এর মধ্যে পার্থক্যগুলো লিখুন। ৫[45th BCS]

সম্ভাব্য প্রশ্ন সাজেশন্স

SL	Question
	What is digital signature? Describe its role in digital security?
	What do you understand by DOS attack and Man-in-the-middle attack? Please explain how it can be occurred?
	Describe secret key and public key encryption
	What are the differences between message confidentiality and integrity? Can you have without the other?
	Briefly describe the relationship among threat, vulnerability and attack. Give examples.
	Write about public key encryption? Describe Digital signature with example?
	What is digital signature? Where it is used?
	Define information security with its components.
	What are encryption and decryption?
	What kind of threats exist for a cryptographic system?
	Explain the principle of man-in-the-middle and session hijacking attack with diagram.
	What is DHCP starvation? Explain briefly.

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	Write short notes on following: 1) Digital signature 2) Cloud computing 3) Blockchain 4) IoT
	Short note: Fire walls, COCOMO 2, Microcontroller, Query optimization, Genetic algorithm, UML
	Public key cryptography কিভাবে কাজ করে ?
	What is cyber vandalism? Describe briefly.
	What is digital signature ? How digital Signature works?
	What is biometric security ? Write down some real life applications of it.
	Why cryptography and public key infrastructure are important to E-Commerce
	What are the properties of weak password?
	Define worms and Trojan horse?

Software Engineering	Introduction, Software process. Project management. Requirements engineering processes. System models: Context, data, behavioral and object models. Object oriented design techniques. Real-time software design. System design with reuse. Critical system design dependability, software maintenance, critical system specification and development Verification and validation. Software testing. Software cost estimation: COCOMO model Halstead formula, Graph: Cel analysis of complexity measures, software reliability and availability, Quality assurance

Software Engineering

SL	Question
1	Describe different techniques use the risk analysis of software development explanation. [BCS – 38th(ICT)]
2	Describe agile Model. [BCS – 36th(ICT)]
3	Explain each component of Unit testing Environment. [BCS – 36th(ICT)]
4	Describe the disadvantages of prototype technique[BCS – 36th(ICT)]
5	একজন software প্রকৌশলীর একটি software design করার দায়িত্বগুলো লিখুন। ৫ [45th BCS]
6	Software testing কী? নিম্নের term গুলোর পার্থক্যগুলো লিখুন: [45th BCS] (i) Blackbox testing ও Whitebox testing (ii) Verification ও Validation

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সম্ভাব্য প্রশ্ন সাজেশন্স

SL	Question
	Which factors are to be considered for software pricing?
	What is API? Explain with example
	How alpha, Beta, Gamma testing is performed in software development?
	How quality control can be ensured in software development.
	What do you mean by reliability and validity of a model?
	What do you mean by "Prototyping" in software design? What are the different steps in prototyping?
	What is difference between Black-box testing and White-box testing?
	What is SDLC? Define the activities of the design phase in SDLC.
	Explain software validation, verification and modularity.
	Briefly describe unit testing, smoke testing and stress testing in the context of software engineering?
	What is alpha-version and beta-version in software engineering?
	What is Agile? Mention it's four values
	MVC framework কি? এর সুবিধা গুলো লিখুন।
	UML Diagram like Use Case, Class Diagram
	Functional and Non Functional Testing All types
	Agile, Waterfall, Prototype, Spiral, SCRUM, extreme Programming
	Software Maintenance Life Cycle, Feasibility Study steps, Software Security Life Cycle.

Programming	Introduction to computer programming. Assembling language programming. Problem solving techniques, algorithm specification and development. Programming style, testing and debugging. Program design techniques: Structured and modular program design. Programming languages and paradigms: classification. Programming in C: Data type, statements, control structures, arrays, pointers, strings, functions, preprocessor directives, structures, unions and bit-fields, files. Introduction to object oriented programming: Encapsulation, inheritance and polymorphism, Mechanic Language Programming, Template functions and classes multi-threads exceptions, Class and object. Introductory programming with C++/JAVA.

Structured Programming

SL	Question
	What is structured programming? with example. [BCS – 38th(ICT)]

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46th & 47th BCS Written Suggestions- CSE 971 & ICT 281

	Write Pseudocode to implement Enqueue and Dequeue operation array of C. [BCS – 36th(ICT)]
	Write a Program of basic calculator operation function using switch statement (+.-,*,/) using any language C/C++[BCS – 36th(ICT)]
	Write a C program to store information using structures with dynamically memory allocation?
	Problem solving technique এর সংজ্ঞা দিন। Structured programming এবং object-oriented programming এর পার্থক্যগুলো লিখুন।[45th BCS]
	1-D array কীভাবে initialize করা যায়? একটা ফাংশন-এ কীভাবে array আমরা pass করতে পারি? [45th BCS]
	একটি C program লিখুন যা একটি 5-digit সংখ্যার সকল digit-এর যোগফল নিরূপণ করতে পারে। এই program এর flowchart আঁকুন। [45th BCS]

সম্ভাব্য প্রশ্ন সাজেশন্স

SL	Question
	What do you mean by Recursion? Calculate Factorial function using recursion with C programming code.
	Differentiate between Array and Structure data type.
	Write a C function for the following: (a) Determine whether a given number is prime or not. (b) Print the following matrix using for loop. 1 22 333 4444 55555 (c) Find the largest number within the array of N elements (d) Determine even or odd numbers
	Write down a program in C/C to reverse a string
	Describe different types of loop structure in C/C++".[
	Write down a program to find length of a string without using any library function.
	Write down a program to find sum of diagonal elements of a two dimensional matrix
	Write down a function in C Programming language, that will take an nxn matrix as parameter and the dimension n as another parameter, then compute the sum of main diagonal elements of the matrix.
	What is the main difference between structure and array in C programming? Explain with examples.
	Write a program to check if a given number is prime or not?
	Why do we need the synchronization feature in a programming language?
	Write a program to implement the Fibonacci sequence without use a recursive function.

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	Write a program to draw a triangle using "*" sign?
	Write down a recursive function to find out number of digits in an integer number(n). Draw the recursion tree when n=5396
	Write down a function to compute the sum of the row a nxn matrix of integer.
	Write down a C function to sort a list of string in alphabetic order?
	Is it possible to convert all "if-else" code into "switch" code block? Give an example.
	Write a program in C/C++ to perform binary search on a list of integer numbers.
	Write a program in C/C++ to identify the largest number of given three numbers.
	How does compiler handle comments in source code?
	Write a program in C/Java to find out the factorial of a number using recursion. Also write its iterative equivalent program.
	What is the difference between sizeof 'c'+1 and sizeof('c'+1)?
	Write down a pseudocode to generate all possible permutation for a given word.
	Differentiate between interpreter and compiler.
	Write down a C function to sort a list of strings in alphabetic order .
	What is the purpose of header file in c Programming Language.
	Write a C Program to multiply two matrices .
	C program to compute the value of X^n.
	Write a Program in C/C++/Java to search an element in an array using binary search

Object Oriented Programming

SL	Question
	State the advantages of object-oriented programming (OOP) over structured programming. **[BCS – 38th (ICT)]**
	What is object-oriented programming? **[BCS – 37th(ICT)]** What are the main features of OOP? How can we solve problem using abstraction? How is a member function of a class?
	Why are the following two overloaded functions inherently ambiguous? int f(int a,int b= 5) and int f(int &a) **[BCS – 38th(ICT)]**
	What are objects in C ++? How is a member function of a class? **[BCS – 37th (ICT)]**
	Explain Early Binding and Late Binding with example? **[BCS – 36th(ICT)]**
	Explain Method overloading and Method overriding with example. **[BCS – 36th(ICT)]**

সম্ভাব্য প্রশ্নসমূহ

46th & 47th BCS Written Suggestions- CSE 971 & ICT 281

SL	Question
	What is polymorphism? Distinguish between compile time and runtime polymorphism?
	What is exception? Explain how it can be used for debugging a program.
	Object oriented প্রোগ্রামিং এর ৪ টি গুরুত্বপূর্ণ বৈশিষ্ট লিখুন।
	Object Oriented programming এ **method overloading** এবং **method overriding** এর মধ্যে পার্থক্য কি?
	Explain polymorphism concept of OOP language.
	What is function overloading? describe with example.
	What is the purpose of contructors and destructors of a class in OOP?
	Write down the three characteristics of Object-Oriented Programming with example.
	What are the different level of data abstraction. What is object oriented programming?

Data Structures:	Arrays: Representation and operations. Sparse and dense matrices: Concept and operation. Stacks and queues: Concept, structures and basic operations. Quick-sort and Polish notation: Applications of stack. Recursion: Concept and applications. Linked lists: Representation and various operations. Trees: Binary trees, traversing binary trees. Binary search trees: Various operations. Binary heaps: Heap sort. Huffman's algorithm. Graphs: Representations and operations. Spanning trees, shortest path and topological sorting. Internal sorting: Insertion sort, selection sort, merge-sort, radix sort, Basic hashing techniques.

Data Structure & Algorithm

SL	Question
	A list of numbers 3,5,7,11,13,17 is stored in sequence. Which of the following data structure will have the least data movement when the number 11 is removed from the list? FIFO, QUEUE, HEAP, Linked list and stack, justify your answer. [BCS – 38th(ICT)]
	Suppose a circular array QUEUE has 6 memory locations. What are the values of front and REAR after the following operation? [BCS – 38th(ICT)] a. Initially QUEUE is empty. b. A, C and D are added to the queue; c. F is inserted. d. Two letters are deleted; e. K, L and M are added to the queue; f. Two letters are deleted and R is added to the queue.

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	How does dynamic memory allocation help in managing data. [BCS – 37th(ICT)]
	What is linear data structure ? Why we use stack ? Difference between array and linked list ?What is merge sort and how it works ? [BCS – 37th(ICT)]
✓	Write a Sorting Algorithm to sort "n" number always in O(nlogn) time. [BCS – 36th(ICT)]
	What are the main functionality of "prority Queue"? How to implement these functions by using heap ? [BCS – 36th(ICT)]
✓	What are the differences between Graph & Tree ? What is Hamiltonian Graph ? [BCS – 36th(ICT)]
✓	What is Big-O ,Big-Omega ,Big theta ? [BCS – 36th(ICT)]
	What is minimum spanning tree ? [BCS – 36th(ICT)]
	Make a binary search tree using following numbers :28/25/30/15/100/105 [BCS – 36th(ICT)]
	Breadth-first search (BFS) এবং Depth-first search (DFS) এর পার্থক্যগুলো লিখুন। কী কী ধরনের problems এর জন্য BFS DFS এর থেকে ভালো? ৫ [45th BCS]
	Array এর পরিবর্তে linked list ব্যবহারের সুবিধাগুলো ও অসুবিধাগুলো লিখুন। ৫[45th BCS]
✓	একটি algorithm এর time complexity এর সংজ্ঞা দিন। কেন Quicksort এর worst-case complexity Q(n ^ 2) সংক্ষিপ্তভাবে লিখুন। ৫[45th BCS]
✓	Sorted linked list এ কী Binary search apply করা সম্ভব কিনা? আপনার উত্তরের সপক্ষে উদাহরণসহ যুক্তি দেখান। ৫[45th BCS]
	মনে করুন যে একটি Binary tree এর preorder traversal post order traversal এর মান যথাক্রমে deafg এবং abdecfg দেওয়া আছে। ঐ Binary tree এর postorder traversal কী হবে? ৫[45th BCS]
✓	Explain how to Bellman Ford Algorithm can identify a negative cycle of a graph. [BCS – 36th(ICT)]
✓	Breadth-first search (BFS) এবং Depth-first search (DFS) এর পার্থক্যগুলো লিখুন। কী কী ধরনের problems এর জন্য BFS DFS এর থেকে ভালো? ৫ [45th BCS]

Algorithm Analysis

Algorithm	Algorithm and complexity: Asymptotic notations. Basic algorithm techniques and analysis: Divide and conquer, dynamic programming, greedy method, branch and bound, string matching, computational geometric problems, graph algorithms, spanning trees, shortest paths, max-flow problem, searching algorithms. Techniques for analysis of algorithms, approximation algorithms, parallel algorithms.

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SL	Question
	Backtracking, NP, NP-Hard and NP complete problem. ৪ [45th BCS]
	ধরুন একটি sum of subset problem এ n = 4 ,w=(w 1 ,w 2 , 3, 4) = (11, 13, 24, 6) এবংm = 30 দেওয়া আছে। w এর সকল সম্ভাব্য subset গুলো বের করুন যার যোগফল এর সমান। এই problem এর সম্ভাব্য solution space tree বের করুন এবং answer mode গুলো চিহ্নিত করুন। ৬ [45th BCS]
	Explain NP-hard and NP complete with example. **[BCS – 36th(ICT)]**
	Describe "Huffman's" Algorithm. **[BCS – 36th(ICT)]**
	Write down about Divide and conquer algorithm. What are the differences between divide and conquer and dynamic programming. **[BCS – 36th(ICT)]**

Computer Architecture

SL	Question
	What is the block diagram of digital computer. Describe each unit briefly. [BCS – 38th(ICT)]
	What are the differences between CISC and RISC architecture ? [BCS – 36th(ICT)]
	How can a optical mouse work ? [BCS – 36th(ICT)]
	How does protected memory Management work ? [BCS – 36th(ICT)]
	Explain Swapping & Memory protection system. [BCS – 36th(ICT)]
	What is pipelining? How does pipeline implementation make faster instruction execution?
	How does an interrupt can be enabled ?

Data Communication	Data Communication: Introduction to OSI and TCP/IP protocol. Data transmission basics: analog and digital data, spectrum and bandwidth. Transmission impairments. Data rate channel capacity. Transmission media: Twisted pair, coaxial cable and optical fiber, wireless transmission. Data encoding: NRZ. NRZI, Manchester and differential Manchester modulation techniques-AM, FM, PM, Delta modulation, compounding Equations, ASK, PSK, FSK. QPSK. QAM sampling theorem, PCM. PPM. PAM. Data transmission: Synchronous and asynchronous and asynchronous. NULL modem configuration. Data link control error and flow control CRC and HDLC. Multiplexing: FDM, TDM, statistical TDM. Basic circuit switching and packet switching techniques.

Communication

SL	Question
	Determine the nyquist sampling rate and the nyquist sampling interval for the signal X(t) = sin(2100pit) 37th BCS
	What is modulation ? Describe the pulse code modulation technique.State the advantage and disadvantage of PCM . 37th BCS

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	What is the block diagram of digital computer. describe each unit briefly.
	What is pipelining? How does pipeline implementation make faster instruction execution?
	Data communication এ Multiplexing কী? TDM এবং FDM এর মধ্যে পার্থক্যগুলো লিখুন। ৫ [45th BCS].

Database	Definition of DBMS, types of DBMS, its advantages and disadvantages, Data model: ER model and relational model. Integrity constraints. Functional dependencies. Assertions and triggers. File organization: Definition of various file organization, classification and Representation. Indexing techniques: sparse and dense indexing. B+ tree indexing, hash indexing. Relational database design: normalization, 2NF, 3NF and BCNF. Query processing: Various notations, cost estimation of selection operation and join operation. Transaction concept and concurrency control: Lock based protocol, deadlock handling. SQL and application using SQL.

Database

SL	Question
	What is database security? Describe different approaches to ensure database security. [BCS – 38th(ICT)]
	Explain primary key and foreign key. [BCS – 36th(ICT)]
	What are the DDL and DML? [BCS – 36th (ICT)]
	What is database normalization? Why 1NF,2NF,3NF and BCNF. [BCS – 36th(ICT)]
	How hash indexing & B+ Tree indexing? [BCS – 36th(ICT)]
	What is SQL? Write down two examples of SQL. [BCS – 36th(ICT)]
	Normalization কী? BCNF উদাহরণসহ আলোচনা করুন।৫ [45th BCS]
	Functional dependency এর সংজ্ঞা দিন। ইহার Armstrong's axioms property গুলো লিখুন। ৫ [45th BCS]
	নিম্নলিখিত Transaction হতে inconsistency state ব্যাখ্যা করুন (যদি থাকে)। ৫ [45th BCS]

T1	T2

	read (a) A:=A-5 Write (A) read(B) B:= B+50 Write(B) commit	 read(A) temp: = A*0.12 A:= A- temp Write(A) Write(B) B:= B + temp Write(B) commit	

Digital Systems	Digital System: Number system: binary, octal, hexadecimal and BCD. Data representation. Logic gates and Boolean algebra: Combinational circuits. Circuit design using logic gates. Circuit and expression minimization: Karnaugh map and Quine-McCluskey. Basic flip-flops (FF), Design of half and full adder. Basic counters and register. Basic decoders, encoders, multiplexers and demultiplexers. ADC and DAC circuits. PLA design, Pulse mode and fundamental mode logic, Pulse & switching units, Newtrivibrations , Digital LC: DTL, TTL, III, CMOS MOS gates, Memory system, LED, LCD applications of Op-Amps. Cooparators.

Digital Logic Design

SL	Question
	Consider the following algebraic equation : Y = AB'CD' +ABC'+A'BD+AB'CD **[BCS – 38th(ICT)]** a. Draw the truth table that satisfies the above-mentioned equation b. Simplify the equation using k-map c. Draw the circuit diagram for the simplified equation by using basic gates. Calculate the number of basic gates required for implementing the simplified circuit. d. Draw the circuit for simplified equation by using only NOR gate.
	How to convert a J-K Flip Flop to a T Flip Flop ? [BCS – 36th(ICT)]

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	Design a 4-bit binary adder using 1-Bit full adder circuit. [BCS – 36th(ICT)]
	(E)16 সংখ্যার decimal, octal এবং binary রূপ লিখুন। নিম্নলিখিত Hexadecimal sequence এর পরবর্তী ৪টি সংখ্যা কী হবে লিখুন। 6FC, 6FE,------, --------, --------, -------- ৫[45th BCS]
	Boolean function কী? নিচের Boolean function-কে কীভাবে সহজীকরণ করা যেতে পারে? F = A'B' C + A' BC + AB' ৫[45th BCS]
	(+55)10 এর 2's complement লিখুন। J-K flip-flop এবং clocked D-flip-flop এব পার্থক্যগুলো দেখান। ৫ [45th BCS]
	(A+B) V(not A) V (not C) এর truth table নির্ণয় করুন। ৫ [45th BCS]
	Two input multiplexer এর logic circuit অঙ্কন করুন। Multiplexer এবং demultiplexer এর তুলনা করুন। ৫ [45th BCS]

Discrete Mathematics	Discrete Mathematics: Prepositional and predicate calculus: Basic concept. Theory of sets: set operations, algebra of sets. Mathematical induction. Basic concept of relations and its representation. Functions and its classification and pictorial representation. Graph theory and its application. Elementary number system. Principles of counting. Reversion, generating, functions, recurrence relation.

Discrete Mathematics

SL	Question
	Write down the differences between propositional logic and Predicative logic? **[BCS – 36th(ICT)]**
	Explain the functionality of a push down automata. **[BCS – 36th(ICT)]**
	How many permutations are possible from 26 Alphabet letters but they don't have match with car, dog and byte? **[BCS – 36th(ICT)]**

Artificial Intelligence	Overview of AI. General concepts of knowledge. Introduction to PROLOG. Knowledge representation. Intelligent agents. First order logic. Knowledge organization and manipulation: Search strategies, matching techniques and game planning. Natural language processing, Probabilities reasoning, expert systems and computer vision, Knowledge acquisition: Learning in symbolic and non-symbolic representation

AI & Machine Learning

SL	Question
	Explain Naïve Bayesian Model with example. **[BCS – 36th(ICT)]**

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	Describe the procedure of Genetic Algorithm. **[BCS – 36th(ICT)]**
	AI এর Agent কত প্রকার ও কী কী এবং তাদের কাজগুলো লিখুন।৫ [45th BCS]
	AI এর Adversarial search উদাহরণসহ ব্যাখ্যা করুন। ৫ [45th BCS]
	Machine learning এ overfitting কী? কীভাবে আমরা Machine learning এ overfitting এড়াতে পারি? ৫ [45th BCS]
	Supervised learning, unsupervised learning Supervised learning, এবং reinforcement learning এর সংজ্ঞা দিন। এগুলো ব্যবহারের উদ্দেশ্যগুলো কী? ৫ [45th BCS]

Microprocessor & Interfacing	Microprocessor and Interfacing: Microprocessor and microcomputers. Evolution of microprocessor. Architecture of a general purpose microprocessor and its operation. Addressing modes. Common instruction types: Basic assembly instruction set. Intel 8086 microprocessor: Internal architecture, register structure, programming model, addressing modes and instruction sets. Interrupts its classification and interrupt handling, Memory management in Intel 80x86 family: Real-mode memory management, segmentation and segmented to physical address translation. Protected mode memory management: Segmentation and virtual addressing, segment selectors and descruptors and tables. Intel 80386 and 80486 register formats. Paged memory operation and TLB structure I/O port organization and accessing. Interfacing the keyboard, printer and monitor. Structure and operation of certain chips as 8255A, 8253, 8272, 8259A, 8237. Bus interfaces and micro controllers.

Microprocessor

SL	Question
	Describe the architecture of Intel 8086 Micrprocessor. **[BCS – 36th(ICT)]**
	Assembly language কী? এর বৈশিষ্ট্যগুলো লিখুন। একটি Assembly language program লিখুন যা দুটি সংখ্যার যোগফল ও গুণফল নিরূপণ করতে পারে। ৫ [45th BCS]
	Intel 8086 microprocessor এর block diagram আঁকুন। 8086 microprocessor এর বৈশিষ্ট্যগুলো লিখুন। ৫ [45th BCS]
	নিম্নলিখিত 8086 program status word এর অর্থ লিখুন। ৫[45th BCS]
	8086 microprocessor এর memory segmentation কেন প্রয়োজন? 16-bit microprocessor-এ 20-bit physical address তৈরি করা পদ্ধতি কী? ৫[45th BCS]

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	Microprocessor addressing mode কেন দরকার? 8086 microprocessor এর জন্য উদাহরণসহ immediate addressing mode এবং indexed addressing mode ব্যাখ্যা করুন। ৬ [45th BCS]
	Interrupt এর উদাহরণসহ সংজ্ঞা দিন। যদি processor এর গতি ১-৮ GHz হয় তবে এর time period কত হবে ? [45th BCS]
	Intel 8086 microprocessor এর block diagram আঁকুন। 8086 microprocessor এর বৈশিষ্ট্যগুলো লিখুন। ৫ [45th BCS]
	Microprocessor addressing mode কেন দরকার? 8086 microprocessor এর জন্য উদাহরণসহ immediate addressing mode এবং indexed addressing mode ব্যাখ্যা করুন। ৬ [45th BCS]
	8086 microprocessor এর memory segmentation কেন প্রয়োজন? 16-bit microprocessor-এ 20-bit physical address তৈরি করা পদ্ধতি কী? ৫[45th BCS]
	নিম্নলিখিত 8086 program status word এর অর্থ লিখুন। ৫[45th BCS]

S	Z	AC	P	CY
0	0	1	1	0

Computer Organization and Architecture:	Fundamentals of computer design. Processor and ALU design. Control design: Hardware control and micro-programmed control. Caches Memory organization. Exceptions System organization Bus and hazards I/O subsystem and I/O processor. Parallel processing: Concept, pipeline processors. Interrupts systolic arrays and fault-tolerant computers.

Computer Organization and Architecture:

SL	Questions
1	What is the block diagram of digital computer. Describe each unit briefly. [BCS – 38th(ICT)]
2	What are the differences between CISC and RISC architecture ? [BCS – 36th(ICT)]
3	How can a optical mouse work ? [BCS – 36th(ICT)]
4	How does protected memory Management work ? [BCS – 36th(ICT)]
5	Explain Swapping & Memory protection system. [BCS – 36th(ICT)]
6	What is pipelining? How does pipeline implementation make faster instruction execution?
7	How does an interrupt can be enabled ?

Computer Network and the Internet:	Protocol, fundamentals of control protocol, Introduction and network types, LAN, MAN, WAN. Topologies: Star, switched, bus, ring. Ethernet LAN standards. Internetworking: Network interconnection, bridges, routers. Network layer protocols: IP, ARJP, ICMP, IP addresses. Unicast and multicast routing protocols. IPV6

	congestion control, Transport layer protocol: TCP and UDP. Introduction to wireless LAN, VSAT, analog and digital cellular system.

Compiler and theory of computation	Introduction to compiler. Basic issues, lexical analysis, logical analysis, syntax analyses. Semantic analysis, type checking, run-time environments, code generation, code optimization and language theory **TOC NFA DFA Regular expression**

Networking

SL	Question
	Host IP address in a network is written as both 192.68.25.16/28 and 3FFE:85B:IFIF::A9:1234. **[BCS – 38th(ICT)]** a. Which one is IPV4 address ? How many bits are used for IPV6 address? How does the above IPV6 address completely with the addressing scheme? b. How many subnets and hosts are to be supported by the above mentioned IPV4 address ?
	Distinguish between TCP and UDP. **[BCS – 37th(ICT)]**
	What is OSI model? Draw the diagram of OSI model. State the protocol of each layer . **[BCS – 37th(ICT)]**
	What is static IP? (b)Why do we need static private ip address and advantages of it .
	How DNS does work? **[BCS – 36th(ICT)]**
	HTTP এবং DNS এর সংজ্ঞা দিন। ধরুন যে mygov.bd একটি ডোমেইন নেম। এখানে DNS কীভাবে কাজ করে? ৫ [45th BCS]
	TCP ও UDP হলো Transport layer protocol এর উদাহরণ। এই protocol দুটির পার্থক্যগুলো লিখুন।৩ [45th BCS]
	চিত্রসহ circuit switching এবং packet switching এর পদ্ধতি আলোচনা করুন। ৭ [45th BCS]
	Network এর topology এর সংজ্ঞা দিন। একটি কম্পিউটার ল্যাব স্থাপনের জন্য BUS topology দ্বারা LAN এর চিত্র অঙ্কন করুন।৫ [45th BCS]

Miscellaneous

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SL	Question
	Difference between E-Commerce and M-commerce
	What are barriers of E-Commerce?
	What is cryptography and public key infrastructure are important?
	A full joint distribution for the Toothache, Cavity and Catch is given in the table below. What is the probability of Cavity, given evidence of Toothache? | | Toothache | | ¬ Toothache | | | | Catch | ¬ Catch | Catch | ¬ Catch | | Cavity | 0.108 | 0.012 | 0.072 | 0.008 | | ¬ Cavity | 0.016 | 0.064 | 0.144 | 0.576 |