Cochin University of Science & Technology

Screening test for the appointment of Assistant Professors in Dept. of Computer Science

Questions and Answers of the online test held on 11/07/2015

Question 1

What is SETUP and HOLD TIME for a flip-flop?

i) When considering synchronous input signals to a flip-flop, HOLD TIME is the minimum amount of time that the data signal should be held steady BEFORE the clock event so that the data is reliably sampled by the clock.

ii) When considering synchronous input signals to a flip-flop, HOLD TIME is the minimum amount of time that the data signal should be held steady AFTER the clock event so that the data is reliably sampled by the clock.

iii) When considering synchronous input signals to a flip-flop, SETUP TIME is the minimum amount of time that the data signal should be held steady BEFORE the clock event so that the data is reliably sampled by the clock.

iv) When considering synchronous input signals to a flip-flop, SETUP TIME is the minimum amount of time that the data signal should be held steady AFTER the clock event so that the data is reliably sampled by the clock.

Select one:

- a. i and iii
- b. i and iv
- c. ii and iii
- d. ii and iv

The correct answer is: ii and iii

Question 2

If one uses electronic codebook (ECB) block cipher mode to transmit a series of related blocks of data, which of the following is true?

Select one:

- a. A single bit flip error in the first block will corrupt decryption of that block only
- b. A single bit flip error in the first block will corrupt decryption of the first and second block
- c. A single bit flip error in the first block will corrupt decryption of the first, second, and third blocks
- d. A single bit flip error in the first block will corrupt decryption of all blocks of the transmission

The correct answer is: A single bit flip error in the first block will corrupt decryption of that block only

Question 3

Which of the following attack can endanger the security of the Diffie-Hellman key

sharing method if two parties are not authenticated to each other?

Select one:

- a. plain-text attack
- b. cipher-text attack
- c. man-in-the-middle
- d. meet-in-the-middle

The correct answer is: man-in-the-middle

Question 4

Which of the following will let you assume a user's identity at a dynamically generated web page or site?

Select one:

- a. Buffer-overflow attack
- b. Cross-site scripting
- c. SQL attack
- d. File system traversal

The correct answer is: Cross-site scripting

Question 5

A SYN flood attack can be detected from which of the following?

Select one:

- a. A large number of SYN packets appearing on the network without corresponding ACK responses
- b. Packets that have both the same source and destination IP addresses
- c. A large number of SYN packets appearing on the network with random segment sizes
- d. Packets that have both the same source and destination port addresses

The correct answer is: A large number of SYN packets appearing on the network without corresponding ACK responses

Question 6

The precondition for applying Binary Search on an array of n elements is that

Select one:

- a. the array should be sorted
- b. the array should be sorted in ascending order
- c. the array should be sorted in descending order
- d. None of these

The correct answer is: the array should be sorted

Question 7

Depth First Search of a graph uses the following data structure for implementation

Select one:

- a. Stack

b. Queue

c. Heap

d. None of these

The correct answer is: Stack

Question 8

Which of the following is true?

i) The normal execution flow of a program can be modified by sporadic events internal or external to the machine. This change of normal flow of execution is called an interrupt.

ii) A synchronous interrupt (also called exception) is related to the instruction being executed, such as the interrupt generated when we divide a number by zero.

iii) A synchronous interrupt (also called exception) is caused by events external to the microprocessor/microcontroller, e.g., from an I/O device.

iv) A processor checks to see if any interrupt has occured after an instruction has finished execution but before committing the result of the instruction to register/memory.

Select one:

a. i and iii

b. ii and iv

c. i, ii and iv

d. i, iii and iv

The correct answer is: i, ii and iv

Question 9

What happens when an interrupt is encountered?

i) The process which was running when the interrupt occured is killed, ie., deleted from the run queue.

ii) The state of the process (registers) is saved on the stack.

iii) The control is transfered to the appropriate Interrupt Service Routine (ISR).

iv) A regular return instruction is executed at the end of the Interrupt Service Routine which loads the Program Counter Register with the contents of the Link Register.

Select one:

a. i and iv

b. ii and iii

c. i and ii

d. iii and iv

The correct answer is: ii and iii

Question 10

When a function call is executed, space is created on the stack, called a stack frame, to store which of the following?

i) Local variables of the function that has just been called.

ii) Parameters that the calling function needs to pass to the function that has just been called.

iii) Stack Pointer that exists at the time that the function has just been called.

iv) Return Address that the calling function will resume executoin at after the called function has completed execution.

Select one:

- a. i, ii and iii
- b. ii, iii and iv
- c. i, iii and iv
- d. i, ii, iii and iv

The correct answer is: i, ii, iii and iv

Question 11

Consider a simple, five stage, DLX architecture where an instruction goes through the five stages of Fetch, Decode, Execute, Memory and Writeback. What happens in the different stages of an instruction?

i) In the Fetch stage, the 32 bits representing an instruction are fetched from instruction memory and placed in a register in the CPU.

ii) In the Decode stage, the control signals needed to execute the instruction are generated from the different bits of the instruction obtained in the previous stage.

iii) In the Execute stage, The different control signals are fed as inputs to the datapath in order to select different registers to operate on, as well as to select the appropriate arithmetic or logic function to perform.

iv) Memory stage, is absolutely required for all instructions

v) In the Writeback stage, the data calculated by the ALU is written back to the register file.

Select one:

- a. i, ii and iii
- b. ii, iii and iv
- c. i, ii, iii, iv and v
- d. i, ii, iii and v

The correct answer is: i, ii, iii and v

Question 12

Which of the following is true?

i) A 32 bit, byte addressable machine has exactly 4GB of virtual memory.

ii) A 32 bit, byte addressable machine should always have 4GB of physical memory.

iii) Virtual memory enables every process to assume that he has the maximum memory supported.

iv) Virtual memory gives the programmer the impression that he has more physical memory than he really has on his machine.

Select one:

- a. i and iii
- b. ii and iv
- c. i, iii and iv
- d. ii, iii and iv

The correct answer is: i, iii and iv

Question 13

Pipelining

i) always increases the processor performance

ii) create pipeline hazards

iii) paralellises h/w operations

iv) is transparent to software

Select one:

- a. i and ii only
- b. ii and iii only
- c. iv only
- d. ii, iii and iv only

The correct answer is: ii, iii and iv only

Question 14

A statement in C language

i) should have an R_VALUE

ii) should have an L_VALUE

iii) should have an expression that evaluates to R_VALUE

iv) should have an address that represents L_VALUE

Select one:

- a. i only
- b. i and ii only
- c. i and iv only
- d. i, ii, iii and iv

The correct answer is: i, ii, iii and iv

Question 15

Which of the following is true of programming language principles?

i) syntax describes the structure and composition of allowable phrases and sentences

ii) sematics describes the meaning of the syntax

iii) syntax but not semantics are essential for a language

iv) pragmatics defines usefulness of syntax and semantics

Select one:

- a. i only
- b. iv only
- c. i, ii and iv
- d. i and iii

The correct answer is: i, ii and iv

Question 16

Lex and Yacc

i) Lex parses language grammar

ii) Yacc validates the semantics

iii) regular expressions can be parsed by Lex to return tokens

iv) Lex and Yacc are built into a compiler

v) Lex and Yacc as tools to help develop compiler

Select one:

- a. i and ii
- b. ii only
- c. iii and iv
- d. ii, iii and v

The correct answer is: ii, iii and v

Question 17

Compare and contrast typedef and #define

i) #define replaces text

ii) typedef defines a new datatype

iii) #define can always be used to replace typedef

Select one:

- a. i, ii and iii
- b. i only
- c. ii and iii
- d. i and ii

The correct answer is: ii and iii

Question 18

Function pointer in C language

i) enables dynamic calling of functions

ii) stores an address

iii) can represent a function

iv) can be stored in a datastructure unlike functions

Select one:

- a. i and ii only
- b. i and iii only
- c. ii and iii only
- d. i, ii, iii and iv

The correct answer is: i, ii, iii and iv

Question 19

A function in C, whose output of computation is larger than the supproted standard datatype

i) may return the output in a variable

ii) may store the output in a global variable

iii) may store the outout in heap allocated by malloc and return the pointer

iv) may accept a heap address as pointer and fill the output as its content

Select one:

- a. i only
- b. ii and iii only
- c. ii, iii and iv
- d. ii and iii only

The correct answer is: ii, iii and iv

Question 20

A C language program

i) can generate only one executable after compilation

ii) can have more than one C files

iii) can have function in one file called by function in another

iv) should have object files linked to generate executable

Select one:

- a. i and iv only
- b. i, ii, iii and iv
- c. iii only
- d. ii and iii only

The correct answer is: i, ii, iii and iv

Question 21

ELF & COFF are

i) Binary file descriptors defining object file

ii) Defines sections containing binary code and related info

iii) Binary formats understandable by the processor

iv) can be both unlinked or linked binaries

Select one:

- a. i only
- b. ii only
- c. ii and iii only
- d. i, ii and iv only

The correct answer is: i, ii and iv only

Question 22

ABI (application binary interface)

i) Makes the application binary memory efficient

ii) Makes the application binary portable

iii) Defines procedure call conventions

iv) Varies based on processor and compiler

Select one:

- a. ii only
- b. i and iii only
- c. ii, iii and iv only
- d. iv only

The correct answer is: ii, iii and iv only

Which is the most appropriate statement of the following ?

i) Floating point representation is compute intensive but more accurate for most values

Question 23

ii) Floating point representation is more power consuming than fixed point

iii) Implementing algorithms using fixed point hardware is more complicated than floating point

Select one:

- a. i
- b. i and ii
- c. iii
- d. i, ii and iii

The correct answer is: i, ii and iii

Question 24

Recursion in programming languages

i) consumes stack space

ii) cosumes heap space

iii) enables easier implementation of complex functions

iv) refers to self-calling functions

Select one:

- a. i and ii only
- b. ii and iii only
- c. iii only
- d. i, iii and iv only

The correct answer is: i, iii and iv only

Question 25

Mutex

i) is a synchronisation primitive

ii) enables multi-threaded shared global data

iii) is a type of binary semaphore

iv) blocks other threads except the one in the critical section

Select one:

- a. i only
- b. ii and iii only
- c. i and iv only
- d. i, ii, iii and iv only

The correct answer is: i, ii, iii and iv only

Question 26

Hard-real time aspect of an OS is about

Select one:

- a. speed
- b. accuracy
- c. latency
- d. memory foot-print

The correct answer is: latency

Question 27

Kernel is

i) core of an OS

ii) provides library APIs

iii) facilitates system calls

iv) drives peripherals , processor and memory

Select one:

- a. ii only
- b. ii and iv only
- c. i, iii and iv only
- d. iii only

The correct answer is: i, iii and iv only

Question 28

Drivers in OS

i) are part of the OS kernel

ii) abstracts the h/w peripherals

iii) pages the system memory

iv) schedules the processor

Select one:

- a. i and ii only
- b. iii only
- c. iv only
- d. i and iv only

The correct answer is: i and ii only

Question 29

The performance of a Hash Table is dependent on

i) the size of the array of buckets

ii) the number of elements stored in the Hash Table

iii) the hashing function

iv) whether there are unique elements stored in the Hash Table

Select one:

- a. i and ii
- b. ii, iii and iv
- c. i, ii and iii
- d. iii and iv

The correct answer is: i, ii and iii

An array is a versatile data structure because

i) it allows for random access (constant time) to any element

ii) it can be used to implement other data structures, such as a tree and a

Question 30

hash-table

iii) it can be used to represent sequences, such as strings, easily

iv) it is space efficient as there is almost no storage overhead other than the data that is contained

Select one:

- a. i and ii
- b. i, ii and iii
- c. i, iii and iv
- d. i, ii, iii and iv

The correct answer is: i, ii, iii and iv

Question 31

A Binary Search Tree with unique key values is one where

i) the key of the parent is greater than the left child's key

ii) the key of the parent is less than the left child's key

iii) the key of the parent is greater than the right child's key

iv) the key of the parent is less than the right child's key

Select one:

- a. i and iii
- b. i and iv
- c. ii and iii
- d. ii and iv

The correct answer is: i and iv

Question 32

The height of a Binary Tree with "n" nodes is

i) at least $\log_2 n$

ii) at least n/2

iii) at most n/2

iv) at most n

Select one:

- a. i and iii
- b. i and iv
- c. ii and iii
- d. ii and iv

The correct answer is: i and iv

Question 33

Which of the following is true ?

i) OR and AND are universal gates

ii) Universal gates enable any logic to be implemented using them

iii) NAND is not a universal gate

Select one:

- a. i only

b. ii and iii

c. ii only

d. i, ii and iii

The correct answer is: ii only

Question 34

A Depth First Search on the graph shown below starting from node A would visit the nodes in the following order:

i) A, B, D, C

ii) A, C, B, D

iii) A, B, C, D

iv) A, C, D, B

Select one:

a. i, ii and iii

b. i, iii and iv

c. ii and iv

d. ii, iii and iv

The correct answer is: i, iii and iv

Question 35

A Breadth First Search on the graph shown below starting from node A would visit the nodes in the following order:

i) A, B, C, D

ii) A, C, B, D

iii) A, B, D, C

iv) A, C, D, B

Select one:

a. i and ii

b. ii and iii

c. ii and iv

d. i, ii, iii and iv

The correct answer is: i and ii

Question 36

The time it takes to search for an element in an array with n elements

i) is at least O(n) if the array is sorted

ii) is at least O(log n) if the array is sorted

iii) is at least O(n) if the array is NOT sorted

iv) is at least O(n log n) if the array is NOT sorted

Select one:

a. i and iii

b. i and iv

c. ii

d. ii and iv

The correct answer is: ii

Question 37

Map the appropriate solution approach that you would take to solve the following three problems

i) Coin Change Problem: Make change of certain amount with arbitrary set of base coins

ii) Fractional Knapsack Problem: Fill a knapsack with items so as to maximize value. Note that fractional quantities of items are allowed

iii) Find the median of a set of unsorted numbers stored in an array

Select one:

- a. i - Greedy, ii - Greedy, iii - Divide and Conquer
- b. i - Dynamic Programming, ii - Greedy, iii - Divide and Conquer
- c. i - Divide and Conquer, ii - Dynamic Programming, iii - Greedy
- d. i - Divide and Conquer, ii - Greedy, iii - Dynamic Programming

The correct answer is: i - Dynamic Programming, ii - Greedy, iii - Divide and Conquer

Question 38

Dijkstra's algorithm

i) Fails every time there are negative edges in a graph

ii) Is guaranteed to work only when there are positive edge weights in a graph

iii) Is applicable only for directed graphs

iv) May work even if there are some negative edges in a graph, though it is not guaranteed to do so

Select one:

- a. i, ii and iii
- b. ii, iii and iv
- c. i and iii
- d. ii and iv

The correct answer is: ii and iv

Question 39

Which of the following is NOT a key component of object oriented programming?

Select one:

- a. Inheritance
- b. Encapsulation
- c. Polymorphism
- d. Parallelism

The correct answer is: Parallelism

Question 40

Which of these is TRUE of the relationship between objects and classes?

Select one:

- a. A class is an instance of an object

b. An object is the ancestor of its subclass

c. An object is an instance of a class

d. An object is the descendant of its superclass

The correct answer is: An object is an instance of a class

Question 41

When a class serves as base class for many derived classes, the situation is called

Select one:

a. Polymorphism

b. Hierarchical inheritance

c. Hybrid inheritance

d. Multipath inheritance

The correct answer is: Hierarchical inheritance

Question 42

When two or more classes serve as base class for a derived class, the situation is known as

Select one:

a. Multiple inheritance

b. Polymorphism

c. Encapsulation

d. Hierarchical inheritance

The correct answer is: Multiple inheritance

Question 43

Which is the most appropriate statement of the following ?

i) MUX selects different inputs to generate a single output

ii) Both MUX and DEMUX have select lines

iii) For a MUX with 8 input lines select lines should be 4

Select one:

a. i only

b. ii only

c. iii only

d. i & ii

The correct answer is: i & ii

Question 44

Multiple inheritance leaves room for a derived class to have _____ members.

Select one:

a. dynamic

b. private

c. public

d. ambiguous

The correct answer is: ambiguous

Question 45

UART topology is

i) Master / slave

ii) Serial

iii) Asynchronous Full duplex

iv) Peer to peer

v) Synchronous Semi duplex

Select one:

a. i, iv and v only

b. ii and v only

c. ii, iii and iv only

d. i and iii only

The correct answer is: ii, iii and iv only

Question 46

I2C topology is

i) synchronous bus

ii) semi duplex Master slave

iii) bi-directional

iv) open collector/drain interface

v) 2 wire peer to peer

Select one:

a. i and iii only

b. ii and v only

c. ii, iii, iv and v only

d. i, ii, iii, and iv only

The correct answer is: i, ii, iii, and iv only

Question 47

SPI topolgy is

i) Min 3 wire

ii) Full duplex bi-directional

iii) Asynchrnous peer to peer

iv) Synchronous Master-slave

Select one:

a. iv and ii only

b. i, ii and iv only

c. iii and iv only

d. i, ii, iii and iv

The correct answer is: i, ii and iv only

Question 48

Bluetooth wireless network has the properties

i) 2.4 Ghz Band

ii) 1-3 Mbps speed

iii) IP address based

iv) Master/slave piconet

Select one:

- a. i and iv only
- b. ii and iii only
- c. i and iii only
- d. i, ii and iv only

The correct answer is: i, ii and iv only

Question 49

Which of the following is true about WiFi Technology?

i) has speeds in excess of 11Mbps to 800Mbps

ii) uses 2.4 Ghz 802.3

iii) 2.4 Ghz and 5 Ghz

iv) is IP based

v) uses the IEEE 802.11 a/b/g/n/ac protocol

Select one:

- a. i and ii only
- b. ii and iv only
- c. i, iii, iv and v only
- d. iii and iv only

The correct answer is: i, iii, iv and v only

Question 50

Which of the following is true about Zigbee network?

i) uses 802.15.4 MAC

ii) Supports Mesh topology

iii) uses ISM band operation

iv) uses high and supports power very long range transmission

Select one:

- a. i and ii only
- b. i, ii and iii only
- c. iii and iv only
- d. i, ii, iii and iv only

The correct answer is: i, ii and iii only

Question 51

DCHP

i) enables Dynamic IP address assignment

ii) Resolves HOST name

iii) WAN based global access

iv) LAN based local access

Select one:

- a. ii only
- b. i and iii only
- c. i, ii and iii only
- d. i, ii and iv only

The correct answer is: i, ii and iv only

Question 52

Gateway is

i) essential for every LAN

ii) uses ARP / RARP

iii) have more than one IP

iv) layer 2 based

Select one:

- a. iii and iv only
- b. i, ii and iii only
- c. iv only
- d. ii and iii only

The correct answer is: ii and iii only

Question 53

Proxy server is

i) Layer 4 based

ii) meant for Access control

iii) enable user authenticated access

Select one:

- a. i only
- b. ii only
- c. ii and iii only
- d. i, ii, and iii

The correct answer is: i, ii, and iii

Question 54

With reference to Substraction and 2's compliment, which of the following is true?

i) Assuming 4 bit binary numbers, the 2's complement representation of -8 is 1001.

ii) Subtracting the 4 bit binary number 0011 from 0001 gives the two's complement 4-bit binary number 0010

iii) Assuming 4 bit binary numbers, the 2's complement representation of -8 is 1000.

iv) Subtracting the 4 bit binary number 0011 from 0001 gives the two's complement 4-bit binary number 1110

Select one:

- a. i and ii
- b. i and iv
- c. ii and iii
- d. iii and iv

The correct answer is: iii and iv

Question 55

Difference between ASCII - 1 and Binary one { a = 1; printf("%c - %d\n", a, a) } in C langauge will print

Select one:

- a. 49 - 1
- b. 1 - 49
- c. 1 - 1
- d. 49 - 49

The correct answer is: 49 - 1

Question 56

Difference between Process and thread is that

i) Processes share code segment

ii) Threads share data segment

iii) Threads cannnot share data without IPC

iv) Threads share stack segment

Select one:

- a. i only
- b. ii, iii only
- c. i, ii, only
- d. iii, iv only

The correct answer is: i, ii, only

Question 57

Selection sort iterates, consuming one input element each repetition, and growing a sorted output list. In each iteration, selection sort removes the smallest remaining element from the input data, and appends it at the end of the sorted list. It repeats until no input elements remain. What is its time complexity?

Its time complexity is:

Select one:

- a. O(n)
- b. O(n log n)
- c. O(n^2)
- d. O(n^2 log n)

The correct answer is: O(n^2)

Question 58

Merge sort is a divide and conquer sorting algorithm, which repeated by divides

a list into smaller lists, till we have n lists of size 1. It then merges the smaller lists into larger sublists, taking care to sort the elements while merging.

Its time complexity is:

Select one:

- a. O(n)
- b. O(n log n)
- c. O(n^2)
- d. O(n^2 log n)

The correct answer is: O(n log n)

Question 59

Quick sort is a divide and conquer sorting algorithm, which repeatedly divides a list into smaller lists using a representative pivot element. Elements that are smaller than the pivot are placed in a left sub-list and elements that are greater are placed in the right sublist. The process is repeated on the two sub-lists so formed till the entire list is sorted.

Its time complexity is:

Select one:

- a. O(n)
- b. O(n log n)
- c. O(n^2)
- d. O(n^2 log n)

The correct answer is: O(n log n)

Question 60

FAN_OUT of a logic chip [I-OH - current o/p high V-OH - voltage o/p high]

i) is defined by I-OL / I-IL of datasheet

ii) is affected by V-OH

iii) is related to noise margin

iv) is the maximum number of logic gates drivable by the o/p

Select one:

- a. i only
- b. ii only
- c. iii and iv only
- d. i and iv only

The correct answer is: i and iv only

Question 61

We need to make a super network out of 32 class C blocks. What is the super net mask?

Select one:

- a. 255.255.240.0
- b. 255.255.240.0
- c. 255.255.224.0
- d. 255.255.255. 248

The correct answer is: 255.255.224.0

Question 62

What is the network address if one of the addresses in the network is 168.123.43.82/27 ?

Select one:

- a. 168.123.43.64
- b. 168.123.43.0
- c. 168.123.43.109
- d. 168.123.43.27

The correct answer is: 168.123.43.64

Question 63

Division operator in relational algebra is appropriate to handle which of the following query types?

Select one:

- a. employees work on at most one of the critical projects
- b. employees work on any one of the critical projects
- c. employees work on at least one of the critical projects
- d. employees work on all the critical projects

The correct answer is: employees work on all the critical projects

Question 64

The number of 2 × 4 decoders with enable line needed to construct a 64K × 16 RAM chip from 1K × 4 RAM chips is

Select one:

- a. 5
- b. 21
- c. 16
- d. 8

The correct answer is: 21

Question 65

In the IEEE 754 single precision floating point representation of special value positive infinity is (e: exponent, m: mantissa)

Select one:

- a. e = 0, m != 0
- b. e = 0, m = 0
- c. e = 255, m != 0
- d. e = 255, m = 0

The correct answer is: e = 255, m = 0

Question 66

..... is a higher level synchronization primitive for inter process

communication and is a collection of procedures, variables and data structures grouped together in a special package

Select one:

- a. semaphore
- b. mutex
- c. monitor
- d. TSL instruction

The correct answer is: monitor

Question 67

An operating system contains 4 user processes, which have peak demands of 4, 5, 6 and 3 respectively for resource type R. The minimum number of units of R such no deadlock will ever arise is

Select one:

- a. 18
- b. 15
- c. 10
- d. 20

The correct answer is: 15

Question 68

The minimum frame length for 10 Mbps Ethernet is

Select one:

- a. 64 byte
- b. 48 byte
- c. 128 byte
- d. 40 byte

The correct answer is: 64 byte

Question 69

Which of the following protocol is stateless?

Select one:

- a. FTP
- b. TCP
- c. IP
- d. BGP

The correct answer is: IP

Question 70

A logic i/p voltage 'v' is defined as HIGH (V_{dd} - logic power) [V_{IH} - voltage i/p high V_{IL} - voltage i/p low

V_{OH} voltage o/p high V_{OL}voltage o/p low] use standard notations like V_{dd}, V_{IH}, V_{IL} etc to reduce

confusion

Select one:

- a. $V_{IH} < v < V_{dd}$
- b. $V_{OL} < v < V_{dd}$
- c. $0 < v < V_{OL}$
- d. $V_{IL} < v < V_{IH}$

The correct answer is: $V_{IH} < v < V_{dd}$

Question 71

The number of logical CPUs in a computer having 2 physical dual core CPUs with hyper threading enabled is

Select one:

- a. 4
- b. 8
- c. 16
- d. 2

The correct answer is: 8

Question 72

The time taken to perform union operation of two max-heaps each containing 'n' elements is

Select one:

- a. O (n)
- b. O (n^2)
- c. O (n log n)
- d. O (log n)

The correct answer is: O (n)

Question 73

Consider a packet with data size 4500 byte with no option field and a header size of 20 byte. Assume that the packet travels through a link with an MTU of 2500 byte so that it will become two fragments. Then what is the total length field and fragment offset field respectively for the second fragment?

Select one:

- a. 2020, 2480
- b. 2040, 310
- c. 2040, 2480
- d. 2020, 310

The correct answer is: 2040, 310

Question 74

In normalization of relational databases, lossless and dependency preserving decomposition is always possible up to what normal form?

Select one:

- a. 2 NF

b. 3 NF
c. BCNF
d. 4 NF

The correct answer is: 3 NF

Question 75

In software engineering the term 'fault seeding' is related to which of the following testing?

Select one:
a. Regression testing
b. Smoke testing
c. Mutation testing
d. Fault based testing

The correct answer is: Mutation testing

Question 76

Which of the following is not a software reliability model?

Select one:
a. Logarithmic Poisson Model
b. Reuse-Oriented Model
c. The Jelinski-Moranda Model
d. Basic Execution Time Model

The correct answer is: Reuse-Oriented Model

Question 77

Consider a B-tree of degree t. The maximum number of keys in any internal node is

Select one:
a. 2t+1
b. t+1
c. 2t-1
d. t-1

The correct answer is: 2t-1

Question 78

Which of the following statements is true with respect to operating system threads?

Select one:
a. Context switch is slower with user supported threads
b. Blocking one user level thread blocks all related threads in its process
c. User level threads are not transparent to kennel level threads
d. User level threads need hardware support

The correct answer is: Blocking one user level thread blocks all related threads in its process

Question 79

'Convoy effect' in operating system refers to

Select one:

- a. Excessive page fault due to poor page replacement algorithms
- b. Lower priority process get starved in priority scheduling
- c. Smaller process waiting for larger process to finish in FIFO scheduling
- d. Gradually increasing priority of lower priority process

The correct answer is: Smaller process waiting for larger process to finish in FIFO scheduling

Question 80

Noise margin in Logic circuits

i) is a measure of noise voltage

ii) measued in volts

iii) higher the better

iv) lower the better

Select one:

- a. i only
- b. ii and iv only
- c. iv only
- d. i, ii and iii only

The correct answer is: i, ii and iii only

Question 81

At a particular time of computation, the value of a binary semaphore is 1. Then 7P, 3V and 5 P operations were completed on this semaphore. The current values of semaphore and queue length are respectively

Select one:

- a. 1, 8
- b. 0, 8
- c. 1, 9
- d. 0, 9

The correct answer is: 0, 8

Question 82

Let E1, E2 and E3 be three entities in an E/R diagram with single valued attributes. R1 is a one-to-many relation between E1 and E2; R2 is an one- to-one relation between E2 and E3; and R3 is a many-to-many relation between E1 and E3. What is the minimum number of relations required to represent this situation?

Select one:

- a. 3
- b. 6

c. 5

d. 4

The correct answer is: 4

Question 83

The maximum number of super keys for a relation R(A, B, C, D, E) with two candidate keys say, B and D is

Select one:

a. 24

b. 32

c. 16

d. 8

The correct answer is: 24

Question 84

The IEEE standard for SRS document is

Select one:

a. IEEE 830-1998 standard

b. IEEE 832-1998 standard

c. IEEE 837-1998 standard

d. IEEE 839-1998 standard

The correct answer is: IEEE 830-1998 standard

Question 85

The most desirable form of cohesion in software design process is

Select one:

a. Sequential cohesion

b. Procedural cohesion

c. Functional cohesion

d. Communicational cohesion

The correct answer is: Functional cohesion

Question 86

Which of the following statements is FALSE with respect to concurrency control protocols?

Select one:

a. Conservative 2- phase locking guarantees freedom from deadlock

b. Basic 2-phase locking is a pessimistic concurrency control approach

c. Timestamp ordering guarantees freedom from deadlock

d. Timestamp ordering does not guarantee conflict serializability

The correct answer is: Timestamp ordering does not guarantee conflict serializability

Question 87

Super Bazaar has 108 different items in stock across all its stores in India. The company has collected billing data for 1010 customer transactions. Each individual bill has at most 10 distinct items in it. The company wants to optimize its inventory and has asked for a list of those items that appear in at least 2% of the billed transactions. Which of the following is the most precise upper bound one can compute for the number of such items, given the data?

Select one:

- a. 500
- b. 1000
- c. 5000
- d. 20000

The correct answer is: 500

Question 88

Which of the following statements is the contrapositive of the statement, "You win the game if you know the rules but are not overconfident?"

Select one:

- a. Sufficient condition that you win the game is that you know the rules or you are not over confident
- b. If you don't know the rules or are overconfident you lose the game
- c. If you know the rules and are overconfident then you win the game
- d. If you lose the game then you don't know the rules or you are overconfident

The correct answer is: If you lose the game then you don't know the rules or you are overconfident

Question 89

Let G be a simple graph on 8 vertices such that there is a vertex of degree 1, a vertex of degree 2, a vertex of degree 3, a vertex of degree 4, a vertex of degree 5, a vertex of degree 6 and a vertex of degree 7. Which of the following can be the degree of the last vertex?

Select one:

- a. 3
- b. 0
- c. 5
- d. 4

The correct answer is: 4

Question 90

For sets A and B, let $f : A \rightarrow B$ and $g : B \rightarrow A$ be functions such that $f(g(x)) = x$ for each x. Which among the following statements is correct?

Select one:

- a. The function f must be one-to-one and onto
- b. The function f must be onto and need not be one-to-one

c. The function g must be one-to-one and onto

d. The function g must be onto and need not be one-to-one

The correct answer is: The function f must be onto and need not be one-to-one