UNIVERSITY EXAMINATIONS

UNIVERSITEITSEKSAMENS

UNISA university of south africa

COS1521 (496298) May/June 2017
RCO1521 (482639)

COMPUTER SYSTEMS· FUNDAMENTAL CONCEPTS

Duration 2 Hours 100 Marks

EXAMINERS

FIRST MRS HW DU PLESSIS
SECOND MRS P LE ROUX

Closed book examination

This examination question paper remains the property of the University of South Africa and may not be removed from the examination venue

This paper consists of 28 pages and the instructions for the completion of a mark-reading sheet

Please complete the attendance register on the back page, tear it off and hand it to the invigilator

Instructions:

1 All the questions in this paper are **multiple-choice**
2 There are 80 questions in total Your total mark out of 80 will be converted to a final exam mark out of 100
3 Answer all the questions There is also space for rough work
4 Using a pencil, answer all the questions on the mark-reading sheet
5 Remember to fill in the **unique number** (see top of page) on the mark-reading sheet
6 You are not allowed to use a calculator

EVERYTHING OF THE BEST!

[TURN OVER]

This paper consists of 80 multiple-choice questions.
Each question is worth 1 mark.
Your total out of 80 will be converted to give a final exam mark out of 100.

Mark only one alternative per question with a pencil on the mark-reading sheet.
(Remember to fill in the unique number.)

Section A: Computer background, number systems, data storage, operations on data and logic (27 marks)

QUESTION 1
Which one of the following scientists was not involved in the development of electronic computers in 1930-1950?

1 John Atanasoff
2 Alan Turing
3 Konrad Zuse
4 Blaise Pascal

QUESTION 2
During which computer generation were the higher level languages COBOL and FORTRAN invented?

1 Second generation
2 Third generation
3 Fourth generation
4 Fifth generation

QUESTION 3
Convert the octal number $(602)_8$ to a decimal number

1 $(96)_{10}$
2 $(386)_{10}$
3 $(387)_{10}$
4 $(394)_{10}$

QUESTION 4

Convert the hexadecimal number $(DFE)_{16}$ to an octal number

1 $(6376)_8$
2 $(6476)_8$
3 $(6736)_8$
4 $(6746)_8$

QUESTION 5

Convert the decimal number $(14\ 125)_{10}$ to a binary number

1 $(1110\ 1)_2$
2 $(1110\ 111)_2$
3 $(1110\ 001)_2$
4 $(1110\ 1011)_2$

QUESTION 6

Which one of the following number representations is invalid?

1 $(263)_8$
2 $(812)_8$
3 $(1011)_2$
4 $(FFF)_{16}$

Rough work

Rough work

QUESTION 7

Which one of the following statements regarding the representation of an unsigned integer is FALSE?

1 An unsigned integer can never be negative
2 An unsigned integer can only take positive values greater than 0
3 Most computers define a constant called the *max unsigned integer* to determine the biggest integer that can be represented
4 A computer that uses 8 bits to store an unsigned integer, will store $(10111)_2$ as 00010111

QUESTION 8

Using 8-bit memory and the two's complement representation method to store negative numbers, which of the following is the correct representation for the decimal number -104?

1 10011000
2 01101000
3 10010000
4 10010111

QUESTION 9

Which one of the following statements regarding floating point representation is FALSE?

1. Floating point representation is also called scientific notation
2 A floating point number is made up of a sign, a shifter and a fixed point number
3 Negative numbers cannot be represented in floating point representation
4 The floating point representation of 9,876,000 00 is + (for the sign), 6 (for the shifter) and 9 876 (as the fixed point number

QUESTION 10

Which one the following statements regarding the storage of images is FALSE?

1. The higher the resolution of an image, the less discontinuity in reproduced images can be recognised by the human eye
2 The disadvantages of vector graphics are that the file size is big and rescaling is difficult to do
3 GIF and JPEG are two standards for image encoding
4 While a True-Colour scheme uses more than a million colours, an indexed colour scheme normally uses about 256 colours

QUESTION 11

Calculate $(110011)_2 + (1101)_2$

1 $(1000000)_2$
2 $(1000110)_2$
3 $(1001010)_2$
4 $(1100000)_2$

QUESTION 12

If the input is 11111010 and the output is 01001000, which of the following is NOT a valid mask to apply to the input to get to the output?

1 01001100
2 01001000
3 11001100
4 01001001

Rough work

QUESTION 13

What is the simplest form of the Boolean function x'y + x'y' + x ?

1 0

2 1

3 y' + y

4 x' + x

QUESTION 14

By applying de Morgan's theorem and involution, which of the following expressions represents the same Boolean function as [(A'B) + C] '

1 (A + B') + C'

2 (AB') + C'

3 (A' + B) C'

4 (A + B') C'

QUESTION 15

What is the simplest form of the Boolean function y + x'yz + xyz ?

1 yz

2 1

3 y(1 + z)

4 y

Rough Work

Rough work

QUESTION 16

The following question refer to the incomplete truth table below for the expression

$$G = B' C + AC'$$

What is the expression G in sum of minterms form?

A	B	C	G	minterms	m-notation
0	0	0			m_0
0	0	1	1		m_1
				A'BC'	
0	1	1			m_3
1	0	0			
1	1	1			

1 $m_5 + m_1 + m_2 + m_0$

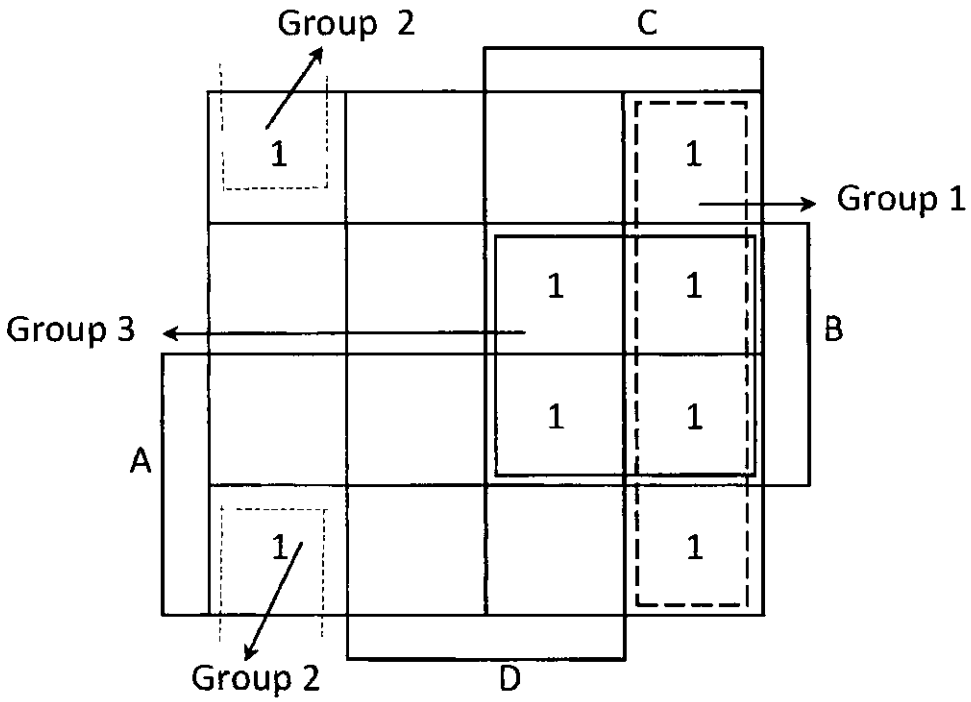
2 $m_5 + m_1 + m_6 + m_4$

3. $m_7 + m_3 + m_2 + m_0$

4 $m_7 + m_3 + m_6 + m_4$

Rough work

Questions 17 and 18 refer to the Karnaugh diagram below:



QUESTION 17

Which term represents Group 1?

1 C
2 D'
3 CD'
4 BCD'

QUESTION 18

Which term represents Group 3?

1 BC
2 BD'
3 AB
4 BCD

[TURN OVER]

QUESTION 19

Which of the Karnaugh diagrams below represents the expression $X = A + BC + AB'$?

1

	B'C'	B'C	BC	BC'
A'	1	1	1	1
A	0	0	1	0

2

	B'C'	B'C	BC	BC'
A'	0	0	1	1
A	1	1	1	1

3

	B'C'	B'C	BC	BC'
A'	0	0	1	0
A	0	1	1	1

4

	B'C'	B'C	BC	BC'
A'	0	0	1	0
A	1	1	1	1

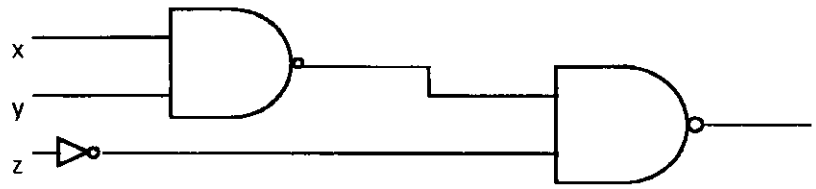
Rough work

[TURN OVER]

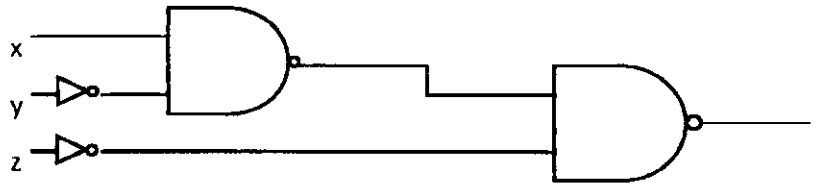
QUESTION 20

Which logic diagram presents the logic expression ((x y') z')' ?

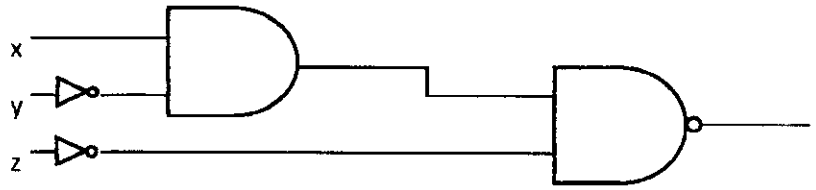
1



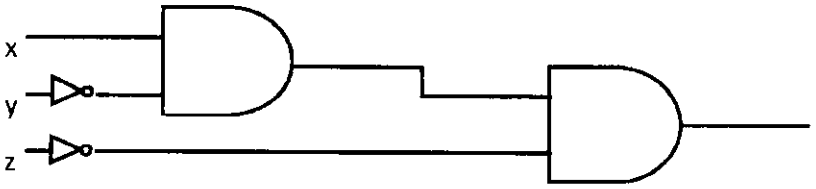
2



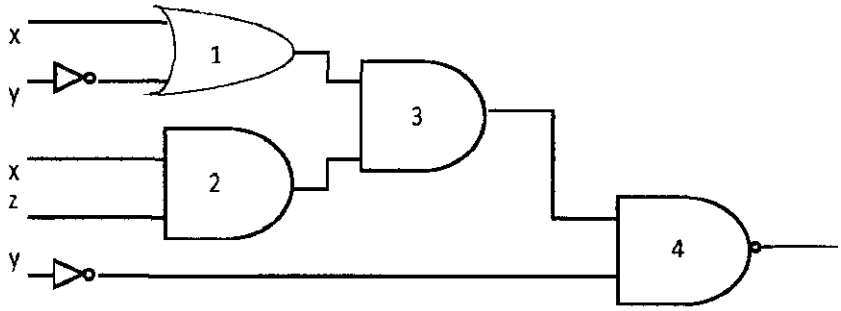
3



4



Questions 21, 22 and 23 refer to the following combinational logic circuit:



QUESTION 21
Gate 4 is an example of a _____ gate

1 AND
2 NAND
3 NOR
4 OR

QUESTION 22
What is the output of Gate 3?

1 (x + y') (x z)
2 (x y') (x z)
3 (x + y') + (x z)
4 (x y') + (x z)

QUESTION 23
What is the output of Gate 4?

1 [((x y') + (x z)) y']'
2 [((x + y') + (x z)) y']'
3 [((x y') (x z)) y']'
4 [((x + y') (x z)) y']'

Rough work

Questions 24, 25, 26 and 27 refer to the following scenario:

A group of students are allowed to have a food stall at the upcoming soccer event at the university, only if they sell all of the following items at their stall

1 Pancakes
2 Hamburgers
3 Pizzas
4 Chips

Student A can make items 1 and 2 Student B can make items 3 and 4 Student C can make items 2 and 4, and student D can make items 1 and 3

A Boolean function F(A,B,C,D) is defined as follows F(A,B,C,D) = 1 when all 4 items are available (and the food stall is therefore allowed) and F(A,B,C,D) = 0 when all 4 items are not available (and therefore the food stall is not allowed)

Different combinations inputs for A, B, C and D are given in the tables provided in the following FOUR questions Which alternative shows the correct outputs for F in EACH of the following FOUR questions?

QUESTION 24

				Alternative 1	Alternative 2	Alternative 3	Alternative 4
A	**B**	**C**	**D**	**F**	**F**	**F**	**F**
1	0	0	0	1	0	0	1
0	1	1	0	0	0	1	1

QUESTION 25

				Alternative 1	Alternative 2	Alternative 3	Alternative 4
A	**B**	**C**	**D**	**F**	**F**	**F**	**F**
0	0	1	1	1	0	0	1
1	1	0	0	0	0	1	1

QUESTION 26

				Alternative 1	Alternative 2	Alternative 3	Alternative 4
A	**B**	**C**	**D**	**F**	**F**	**F**	**F**
1	1	0	0	1	0	0	1
0	0	0	1	0	0	1	1

QUESTION 27

				Alternative 1	Alternative 2	Alternative 3	Alternative 4
A	**B**	**C**	**D**	**F**	**F**	**F**	**F**
1	0	1	0	1	0	0	1
0	0	1	1	0	0	1	1

Rough work

Section B: Computer systems, organisation and networks (18 marks)

QUESTION 28
Which one of the following is not part of the Central Processing Unit (CPU) of a computer?

1 Registers
2 Main memory
3 Arithmetic Logic Unit (ALU)
4 Control unit

QUESTION 29
Which one of the following statements is TRUE about the cache?

1 Main memory is faster than cache memory
2 The CPU is slower than cache memory
3 Cache memory contains a full copy of main memory
4 Cache memory is small in size

QUESTION 30
Which one of the following statements regarding magnetic storage devices is FALSE?

1 A magnetic tape uses an indexed addressing mechanism
2 Magnetic disks are faster than magnetic tapes, but much more expensive
3 A read/write head extracts data from the magnetised surfaces of a magnetic disk
4 The performance of a magnetic disk is determined by the rotational speed, the seek time and the transfer time of the data

QUESTION 31
Which one of the following statements regarding commonly used controllers is FALSE?

1 An SCSI controller interface provides a daisy-chained connection, with both ends of the chain connected to a terminator
2 A FireWire interface can be used to connect up to 63 devices in a daisy chain or tree connection, using only one connection
3 A Universal Serial Bus (USB) only connects high-speed devices to a computer bus
4 An HDMI interface is used to transfer video data from a source to a compatible computer monitor, video projector, digital television or digital audio device

QUESTION 32
Direct Access memory (DMA) is one example of an input/output operation Which of the following is FALSE for DMA?

1 DMA transfers large blocks of data between a high-speed I/O device and memory without passing through the CPU
2 Registers are used to hold blocks of data before and after memory transfers
3 During data transfer the CPU stops using the buses, so that the DMA controller can use them
4 The DMA controller informs the CPU about the type of data transfer, the beginning address and the number of bytes to be transferred

QUESTION 33
CISC and RISC are two commonly used computer architectures. Which one of the following is NOT a characteristic of the CISC architecture?

1 CISC has a large set of simple as well as complex instructions
2 The CPU circuitry and the control unit for the CISC architecture have a very simple design
3 The instructions performed by the CPU are called *micro-operations*, and the memory to hold the simple operations are called *micro-memory*
4 CISC architecture has an overhead associated with micro-programming and access to micro-memory

QUESTION 34
Which protocol layer of the TCP/IP protocol suite does not need addresses?

1 Transport layer
2 Network layer
3 Data-link layer
4 Physical layer

QUESTION 35
Which of the following statements regarding the application layer of the TCP/IP protocol suite is FALSE?

1 It provides services to the user using a logical connection
2 Client-server and peer-to-peer are two application layer paradigms
3 The application layer provides services to the transport layer
4 New application protocols can easily be added to the internet

QUESTION 36
Which layer carries data packets from source to destination?

1 Transport layer
2 Network layer
3 Data-link layer
4 Physical layer

QUESTION 37
Which layer uses the User Datagram Protocol (UDP)?

1 Transport layer
2 Network layer
3 Data-link layer
4 Physical layer

QUESTION 38
Which layer uses a node-to-node communication format?

1 Transport layer
2 Network layer
3 Data-link layer
4 Physical layer

QUESTION 39
Which of the following statements is NOT TRUE of coaxial cable?

1 It has a central core solid wire conductor
2 It consists of a twisted pair of copper conductors
3 The outer metallic wrapping serves as a second conductor
4 Cable TV networks use coaxial cable

QUESTION 40
Which of the following statements regarding the bootstrapping process of the operating system is FALSE?

1 The bootstrap process happens in two stages
2 The bootstrap program is held in ROM memory
3 A CPU counter is set to the first instruction of the bootstrap program
4 The bootstrap program loads the operating system, and then starts its execution

QUESTION 41
Which operating system is expected to do a task within a specific time-constraint?

1 Batch system
2 Real-time system
3 Distributed system
4 Personal system

QUESTION 42
Which of the following statements is NOT TRUE regarding the partitioning technique in multiprogramming?

1 Memory is divided in fixed-length sections
2 Each section holds one program
3 The CPU switches between programs
4 CPU time allocated to each program can be controlled with priority levels

QUESTION 43
Which of the following is NOT TRUE regarding demand segmentation?

1 The program is divided into modules, which are loaded into segments to execute
2 Modules are loaded into memory, executed, and replaced by another module when completed
3 Segments in memory do not have to be of the same size
4 Different segments can contain modules of different programs

QUESTION 44

Which of the following statements regarding a *program*, a *job* and a *process* is FALSE?

1 A program is non-active and is stored on disk
2 A job is a program that has been selected for execution
3 A job is always loaded in memory
4 A process is a program in execution

QUESTION 45

Which of the following is NOT a function of the file manager?

1 It controls access to a file
2 It maintains a queue of the order in which files may be accessed
3 It supervises how and where files are stored
4 It is responsible for archives and backups of files

Section C: Computer algorithms, programming and software development

(18 marks)

QUESTION 46

A list contains the following elements

9 12 13 15 17 22 24 25 29 31 35 40

At the beginning, first = 1, mid = 6 and last = 12 What are the values of first, mid and last respectively after two more iterations of the binary search algorithm if the goal is 35?

1 9, 10, 11
2 9, 11, 12
3 9, 10, 12
4 10, 11, 12

QUESTION 47

Suppose a list contains the following elements

107 301 213 31 101 203 75 341

What is the order of the elements in the list after three passes if selection sort is used?

1 31 75 101 107 213 203 301 341
2 31 75 213 107 101 203 301 341
3 31 75 107 301 213 101 203 341
4 31 75 101 107 301 213 203 341

Rough work

QUESTION 48

Which of the following statements regarding sorting algorithms is TRUE?

1 Insertion sort is the most efficient sorting algorithm
2 Selection sort is more efficient than bucket sort
3 Heap sort is less sufficient than bubblesort
4 Merge sort is more efficient that selection sort

QUESTION 49

Which of the following is NOT a construct used in programming for a structured program?

5 Structure chart
6 Sequence
7 Decision (selection)
8 Repetition (loop)

QUESTION 50

Which of the following statements is NOT TRUE regarding sub-algorithms?

1 A structured algorithm is broken down into sub-algorithms
2 Sub-algorithms perform specific functions and are thus more understandable
3 Sub-algorithms are written once in the program, and can be executed multiple times
4 A sub-algorithm cannot further be divided into more sub-algorithms

QUESTION 51

Which one of the following statements is TRUE regarding search methods?

1 When doing a binary search in a list of numbers, the numbers need not be sorted
2 Binary search is quicker than sequential search
3 A sequential search and a binary search make use of a *first*, *mid* and *last* position while searching
4 The list for a sequential search must be sorted

QUESTION 52

Which part of the translation process of a program uses tokens to, for example, create an assignment statement such as x = 1?

1 Lexical analyser
2 Syntax analyser
3 Semantic analyser
4 Code generator

QUESTION 53
Which of the following is not a programming paradigm?

1 The sequential paradigm
2 The procedural paradigm
3 The functional paradigm
4 The declarative paradigm

QUESTION 54
Polymorphism used in object-oriented programming can be described as the process of

1 defining many classes to represent objects
2 defining many methods to perform different functions
3 allowing an object to inherit characteristics from other objects
4 defining several operations with the same name that can perform different things in related classes

QUESTION 55
Which one of the following statements regarding programming languages is TRUE?

1 Prolog is a procedural programming language
2 Ada is a functional programming language
3 Pascal is a procedural programming language
4 LISP is an object-oriented programming language

QUESTION 56
Which of the following is NOT true for control statements in a program?

1 A control statement consists of a set of statements
2 A control statement always changes the value of a variable in memory
3 Depending on a Boolean value, the order in which statements in a control statement are executed can change
4 The two constructs selection and repetition, are used in control statements

QUESTION 57
Which of the following diagrams are used in the object-oriented analysis of the analysis phase of the software life-cycle?

1 Data flow diagrams
2 Class diagrams
3 Entity-relationship diagrams
4 State diagrams

QUESTION 58
Which one of the following statements regarding the waterfall model for the software life cycle is FALSE?

1 The waterfall model is a very popular model for software development
2 The analysis phase must be completed before the design phase can start
3 The implementation phase cannot start before the design phase is complete
4 The testing phase can be done at any time during the process, i e the design phase can be tested even before the implementation phase is complete

QUESTION 59
Which one of the following diagrams is NOT used during the analysis phase of the procedure-oriented analysis?

1 Data flow diagram
2 Entity-relationship diagram
3 Use-case diagram
4 State diagram

QUESTION 60
Which of the following factors is NOT one of the main software quality factors?

1 Operability
2 Modularity
3 Maintainability
4 Transferability

QUESTION 61
Which one of the following testing methods is not part of black-box testing?

1 Control structure testing
2 Exhaustive testing
3 Random testing
4 Boundary-value testing

QUESTION 62
Which one of the following actions is NOT part of system documentation?

1 Requirements and methods chosen for the analysis phase must be clearly documented
2 The tools used in the design phase must be documented and explained
3 The programming code must be documented with comments and descriptive headers
4 The installation and servicing of the software system must be documented

QUESTION 63
Which one of the following factors is part of the maintainability aspect of software quality?

1 Security
2 Timeliness
3 Flexibility
4 Reusability

Section D: Computer data and files structure, and databases (17 marks)

QUESTION 64
Which one of the following statements is FALSE about arrays?

1 An array consists of a number of elements
2 An element in an array is referenced by its index
3 The index of an array is also called a subscript
4 An array is exactly the same as a record

QUESTION 65
Which of the following statements is TRUE about records?

1 A record is a collection of elements, possibly of different types
2 An element of a record is referred to as for example *record1[name]*
3 A record has a name, and so does each field in the record
4 A record will be used to define a class of 40 students

QUESTION 66
We want to assign the value 2016 to a field called *date* in a record called *exam* Which of the following options would be the correct way?

1 date[exam] ← 2016
2 exam[date] ← 2016
3 date exam ← 2016
4 exam date ← 2016

QUESTION 67
Which one of the following statements regarding linked lists is FALSE?

1 Each element of a linked list consists of at least a data portion and a link
2 A link contains the address of the next element in the linked list
3 Two different links can point to the same element
4 Each element in the list, including the last element, points to its successor

QUESTION 68

Which one of the following statements regarding arrays and linked lists is FALSE?

1 Both arrays and linked lists are representations of a list of items in memory
2 The elements of arrays need not be stored contiguously, because we can get hold of the value of an element via the index
3 The nodes of linked lists need on be stored contiguously, because each node contains the address of the next node
4 Link lists can only be searched sequentially

QUESTION 69

In which one of the following cases would a linked list NOT be suitable to use?

1 A large number of insertions and deletions are needed
2 Data must be searched very often
3 Lists can start with no nodes and can grow as nodes are needed
4 Lists are read sequentially via linked addresses and updated accordingly

QUESTION 70

In a sequential file, the end of the file is indicated by

1 a counter containing the number of records in the file
2 an end-of-file marker at the end of all the records
3 an address of the last record stored in the beginning of the file
4 zero in the last records

QUESTION 71

Which one of the following statements regarding indexed and hashed files is NOT TRUE?

1 An indexed file consists of a data file and an index file
2 An index file can be accessed from disk if a data record needs to be accessed or changed
3 A hashed file does not need an index file
4 Data in a hashed file is reached via a mathematical function

QUESTION 72

In file processing, collision occurs when

1 the file is not big enough to hold all the data records
2 two files are open in memory at the same time
3 the data in the file contains two synonyms, i e two keys collide at the home address
4 the prime area is inaccessible

QUESTION 73
Which one of the following is not a valid collision resolution method?

1 Bucket hashing
2 Modulo division hashing
3 Open addressing
4 Linked list resolution

QUESTION 74
Which one of the following is not a UNIX directory type?

1 Root directory
2 Home directory
3 Working directory
4 Primary directory

QUESTION 75
Which level of a database defines the logical view of the data?

1 Architectural
2 Internal
3 Conceptual
4 External

QUESTION 76
A database management system consists of

1 data and software
2 data, software and hardware
3 data, software, hardware and users
4 data, software, hardware, users and procedures

QUESTION 77
Which one of the following operations is not a unary operation on a relational database?

1 Update
2 Select
3 Extract
4 Project

QUESTION 78

Which one of the following statements is NOT an advantage of databases?

1 Less redundancy
2 Efficiency
3 Consistency avoidance
4 Data integrity

QUESTION 79

Which one of the following statements regarding distributed and object-oriented databases is not TRUE?

1 In a fragmented distributed database, data is locally stored at the corresponding site
2 In a fragmented distributed database, data is localised and global data cannot be accessed
3 In a replicated distributed database, a modification to data is repeated at all replica site for security reasons
4 In an object-oriented database, objects with attributes and their relations are defined in a relational model

QUESTION 80

Which one of the following is not a valid level in database architecture?

1 Internal level
2 Conceptual level
3 User view level
4 External level

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EXAMINATION MARK READING SHEET EKSAMEN-MERKLEESBLAD

PART 1 (GENERAL/ALGEMEEN) DEEL 1

STUDY UNIT or STUDIE-EENHEID bv PSY100-X

1

PAPER NUMBER
VRAESTELNOMMER

2

INITIALS AND SURNAME
VOORLETTERS EN VAN

3

DATE OF EXAMINATION
DATUM VAN EKSAMEN

4

EXAMINATION CENTRE (E G PRETORIA)
EKSAMENSENTRUM (BV PRETORIA)

5

STUDENT NUMBER
STUDENTENOMMER

6

UNIQUE PAPER NO
UNIEKE VRAESTEL NR

8

7

9

For use by examination invigilator

Vir gebruik deur eksamenopsiener

IMPORTANT

1 USE ONLY AN HB PENCIL TO COMPLETE THIS SHEET
2 MARK LIKE THIS
3 CHECK THAT YOUR INITIALS AND SURNAME HAS BEEN FILLED IN CORRECTLY
4 ENTER YOUR STUDENT NUMBER FROM LEFT TO RIGHT
5 CHECK THAT YOUR STUDENT NUMBER HAS BEEN FILLED IN CORRECTLY
6 CHECK THAT THE UNIQUE NUMBER HAS BEEN FILLED IN CORRECTLY
7 CHECK THAT ONLY ONE ANSWER PER QUESTION HAS BEEN MARKED
8 DO NOT FOLD

BELANGRIK

1 GEBRUIK SLEGS N HB POTLOOD OM HIERDIE BLAD TE VOLTOOI
2 MERK AS VOLG
3 KONTROLEER DAT U VOORLETTERS EN VAN REG INGEVUL IS
4 VUL U STUDENTENOMMER VAN LINKS NA REGS IN
5 KONTROLEER DAT U DIE KORREKTE STUDENTENOMMER VERSTREK HET
6 KONTROLEER DAT DIE UNIEKE NOMMER REG INGEVUL IS
7 MAAK SEKER DAT NET EEN ALTERNATIEF PER VRAAG GEMERK IS
8 MOENIE VOU NIE

PART 2 (ANSWERS/ANTWOORDE) DEEL 2

10

1	c1 c2 c3 c4 c5	36	c1 c2 c3 c4 c5	71	c1 c2 c3 c4 c5	106	c1 c2 c3 c4 c5
2	c1 c2 c3 c4 c5	37	c1 c2 c3 c4 c5	72	c1 c2 c3 c4 c5	107	c1 c2 c3 c4 c5
3	c1 c2 c3 c4 c5	38	c1 c2 c3 c4 c5	73	c1 c2 c3 c4 c5	108	c1 c2 c3 c4 c5
4	c1 c2 c3 c4 c5	39	c1 c2 c3 c4 c5	74	c1 c2 c3 c4 c5	109	c1 c2 c3 c4 c5
5	c1 c2 c3 c4 c5	40	c1 c2 c3 c4 c5	75	c1 c2 c3 c4 c5	110	c1 c2 c3 c4 c5
6	c1 c2 c3 c4 c5	41	c1 c2 c3 c4 c5	76	c1 c2 c3 c4 c5	111	c1 c2 c3 c4 c5
7	c1 c2 c3 c4 c5	42	c1 c2 c3 c4 c5	77	c1 c2 c3 c4 c5	112	c1 c2 c3 c4 c5
8	c1 c2 c3 c4 c5	43	c1 c2 c3 c4 c5	78	c1 c2 c3 c4 c5	113	c1 c2 c3 c4 c5
9	c1 c2 c3 c4 c5	44	c1 c2 c3 c4 c5	79	c1 c2 c3 c4 c5	114	c1 c2 c3 c4 c5
10	c1 c2 c3 c4 c5	45	c1 c2 c3 c4 c5	80	c1 c2 c3 c4 c5	115	c1 c2 c3 c4 c5
11	c1 c2 c3 c4 c5	46	c1 c2 c3 c4 c5	81	c1 c2 c3 c4 c5	116	c1 c2 c3 c4 c5
12	c1 c2 c3 c4 c5	47	c1 c2 c3 c4 c5	82	c1 c2 c3 c4 c5	117	c1 c2 c3 c4 c5
13	c1 c2 c3 c4 c5	48	c1 c2 c3 c4 c5	83	c1 c2 c3 c4 c5	118	c1 c2 c3 c4 c5
14	c1 c2 c3 c4 c5	49	c1 c2 c3 c4 c5	84	c1 c2 c3 c4 c5	119	c1 c2 c3 c4 c5
15	c1 c2 c3 c4 c5	50	c1 c2 c3 c4 c5	85	c1 c2 c3 c4 c5	120	c1 c2 c3 c4 c5
16	c1 c2 c3 c4 c5	51	c1 c2 c3 c4 c5	86	c1 c2 c3 c4 c5	121	c1 c2 c3 c4 c5
17	c1 c2 c3 c4 c5	52	c1 c2 c3 c4 c5	87	c1 c2 c3 c4 c5	122	c1 c2 c3 c4 c5
18	c1 c2 c3 c4 c5	53	c1 c2 c3 c4 c5	88	c1 c2 c3 c4 c5	123	c1 c2 c3 c4 c5
19	c1 c2 c3 c4 c5	54	c1 c2 c3 c4 c5	89	c1 c2 c3 c4 c5	124	c1 c2 c3 c4 c5
20	c1 c2 c3 c4 c5	55	c1 c2 c3 c4 c5	90	c1 c2 c3 c4 c5	125	c1 c2 c3 c4 c5
21	c1 c2 c3 c4 c5	56	c1 c2 c3 c4 c5	91	c1 c2 c3 c4 c5	126	c1 c2 c3 c4 c5
22	c1 c2 c3 c4 c5	57	c1 c2 c3 c4 c5	92	c1 c2 c3 c4 c5	127	c1 c2 c3 c4 c5
23	c1 c2 c3 c4 c5	58	c1 c2 c3 c4 c5	93	c1 c2 c3 c4 c5	128	c1 c2 c3 c4 c5
24	c1 c2 c3 c4 c5	59	c1 c2 c3 c4 c5	94	c1 c2 c3 c4 c5	129	c1 c2 c3 c4 c5
25	c1 c2 c3 c4 c5	60	c1 c2 c3 c4 c5	95	c1 c2 c3 c4 c5	130	c1 c2 c3 c4 c5
26	c1 c2 c3 c4 c5	61	c1 c2 c3 c4 c5	96	c1 c2 c3 c4 c5	131	c1 c2 c3 c4 c5
27	c1 c2 c3 c4 c5	62	c1 c2 c3 c4 c5	97	c1 c2 c3 c4 c5	132	c1 c2 c3 c4 c5
28	c1 c2 c3 c4 c5	63	c1 c2 c3 c4 c5	98	c1 c2 c3 c4 c5	133	c1 c2 c3 c4 c5
29	c1 c2 c3 c4 c5	64	c1 c2 c3 c4 c5	99	c1 c2 c3 c4 c5	134	c1 c2 c3 c4 c5
30	c1 c2 c3 c4 c5	65	c1 c2 c3 c4 c5	100	c1 c2 c3 c4 c5	135	c1 c2 c3 c4 c5
31	c1 c2 c3 c4 c5	66	c1 c2 c3 c4 c5	101	c1 c2 c3 c4 c5	136	c1 c2 c3 c4 c5
32	c1 c2 c3 c4 c5	67	c1 c2 c3 c4 c5	102	c1 c2 c3 c4 c5	137	c1 c2 c3 c4 c5
33	c1 c2 c3 c4 c5	68	c1 c2 c3 c4 c5	103	c1 c2 c3 c4 c5	138	c1 c2 c3 c4 c5
34	c1 c2 c3 c4 c5	69	c1 c2 c3 c4 c5	104	c1 c2 c3 c4 c5	139	c1 c2 c3 c4 c5
35	c1 c2 c3 c4 c5	70	c1 c2 c3 c4 c5	105	c1 c2 c3 c4 c5	140	c1 c2 c3 c4 c5

MARK READING SHEET INSTRUCTIONS

Your mark reading sheet is marked by computer and should therefore be filled in thoroughly and correctly

USE ONLY AN HB PENCIL TO COMPLETE YOUR MARK READING SHEET

PLEASE DO NOT FOLD OR DAMAGE YOUR MARK READING SHEET

Consult the illustration of a mark reading sheet on the reverse of this page and follow the instructions step by step when working on your sheet

Instruction numbers ❶ to ❿ refer to spaces on your mark reading sheet which you should fill in as follows

❶ Write your paper code in these eight squares, for instance

P	S	Y	1	0	0	-	X

❷ The paper number pertains only to first-level courses consisting of two papers

WRITE | 0 | 1 | for the first paper and | 0 | 2 | for the second If only one paper, then leave blank

❸ Fill in your initials and surname

❹ Fill in the date of the examination

❺ Fill in the name of the examination centre

❻ WRITE the digits of your student number HORIZONTALLY (from left to right) Begin by filling in the first digit of your student number in the first square on the left, then fill in the other digits, each one in a separate square

❼ In each vertical column mark the digit that corresponds to the digit in your student number as follows [-]

❽ WRITE your unique paper number HORIZONTALLY

NB Your unique paper number appears at the top of your examination paper and consists only of digits (e g 403326)

❾ In each vertical column mark the digit that corresponds to the digit number in your unique paper number as follows [-]

❿ Question numbers 1 to 140 indicate corresponding question numbers in your examination paper The five spaces with digits 1 to 5 next to each question number indicate an alternative answer to each question The spaces of which the number correspond to the answer you have chosen for each question and should be marked as follows [-]

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