UNIVERSITY EXAMINATIONS

UNIVERSITEITSEKSAMENS

UNISA university of south africa

COS1521
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(499933) October/November 2016
(478062)

COMPUTER SYSTEMS: FUNDAMENTAL CONCEPTS

Duration 2 Hours 100 Marks

EXAMINERS
FIRST MR ME BOGOPA
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
What is the step-by-step solution to a problem in a computer program called?

1 An algorithm
2 A computer language
3 Instructions
4 Instructional architecture

QUESTION 2
Which one of the following is a social issue that covers both dependency and social injustice?

1 Privacy
2 The digital divide
3 Copyright
4 Computer crime

QUESTION 3
Convert $(77)_{10}$ to a hexadecimal number

1 $(43)_{16}$
2 $(4D)_{16}$
3 $(54)_{16}$
4 $(5F)_{16}$

QUESTION 4
Convert $(10111\ 01)_2$ to an octal number
1 $(25\ 01)_8$
2 $(52\ 2)_8$
3 $(53\ 1)_8$
4 $(13\ 5)_8$

QUESTION 5

Which one of the following number representations is NOT correct?

1 $(11\ 1)_{10}$
2 $(18\ 3)_{8}$
3 $(11\ A)_{16}$
4 $(100\ 0)_{2}$

QUESTION 6

What is the 2's complement representation of -18 using 6 bits?

1 $(101101)_2$
2 $(101110)_2$
3 $(010010)_2$
4 $(101111)_2$

Rough work

QUESTION 7
Convert $(101\ 1101)_2$ to normalised form

1 $(0\ 1011101)_2 \times (2^{-4})_{10}$
2 $(1\ 011101)_2 \times (2^4)_{10}$
3 $(1\ 011101)2 \times (22)_{10}$
4 $(0\ 1011101)_2 \times (2^3)_{10}$

QUESTION 8
The precision of the fractional part of a number stored in a computer is defined by the _____

1 sign
2 mantissa
3 exponent
4 floating point

QUESTION 9
Which one of the following refers to the process of converting quantized samples values to bit patterns when storing audio?

1 Sampling
2 Quantisation
3 Compression
4 Encoding

QUESTION 10
Which one of the following is an application of the AND operator?

1 To unset specific bits in a bit pattern
2 To set specific bits in a bit pattern
3 To complement all the bits in a bit pattern
4 To flip specific bits in a bit pattern

QUESTION 11
Calculate $(101001)_2 - (1111)_2$

1 $(11001)_2$
2 $(11110)_2$
3 $(11010)_2$
4 $(11101)_2$

Rough work

QUESTION 12

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

1 y + x
2 y
3 (x + x′)y
4 1

QUESTION 13

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

1 0
2 x′yz′ + x′y z
3 x′y
4 1

QUESTION 14

What is the simplest form of the Boolean function (xy y′)′?

1 x′ + y
2 1
3 0
4 xy + y′

QUESTION 15

Consider the following Boolean function

$$F(x,y,z) = m_1 + m_2 + m_5 + m_7$$

Which one of the following four Karnaugh diagrams represents the given function?

1

	y'z'	y'z	yz	yz'
x'			1	1
x		1	1	

2

	y'z'	y'z	yz	yz'
x'		1		1
x	1			1

3

	y'z'	y'z	yz	yz'
x'		1		1
x		1	1	

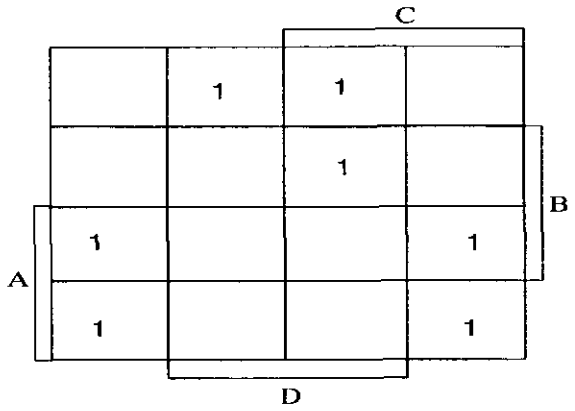
4

	y'z'	y'z	yz	yz'
x'			1	1
x		1		1

Rough work

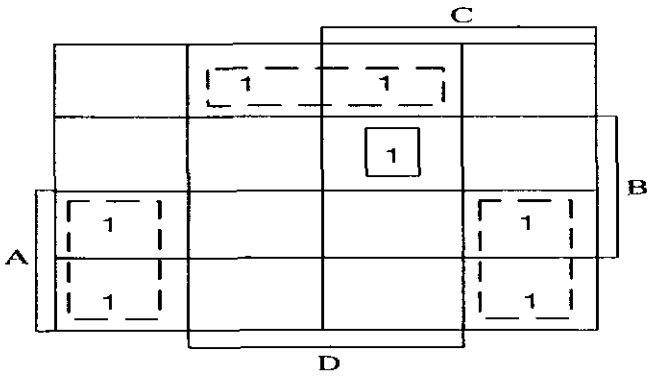
QUESTION 16

Consider the following Karnaugh map

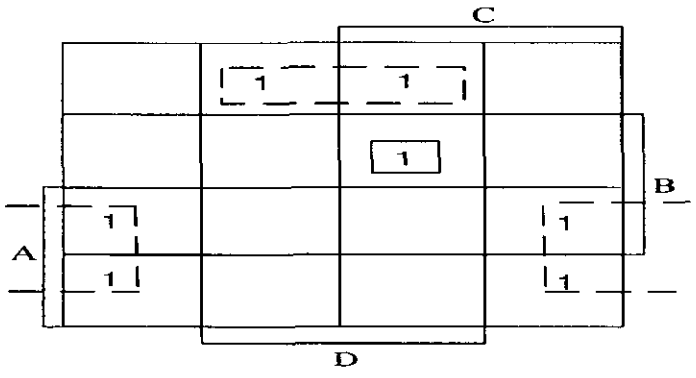


Which one of the following four Karnaugh maps reflects the correct forming of groups?

1



2



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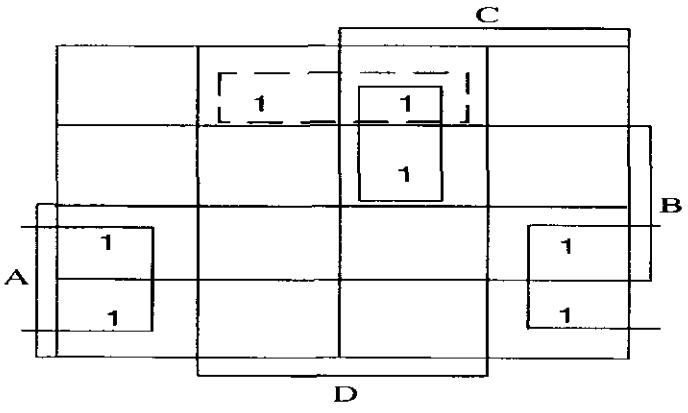

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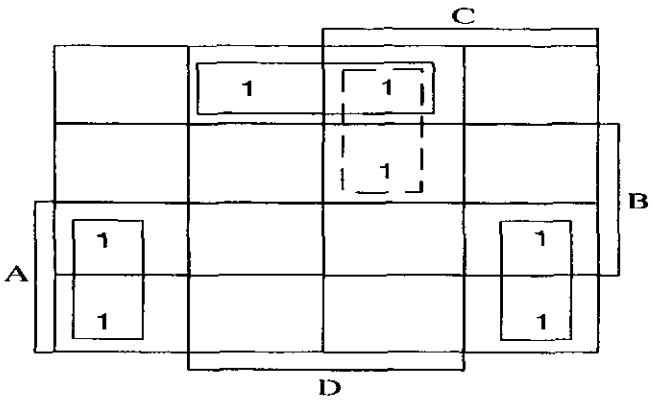
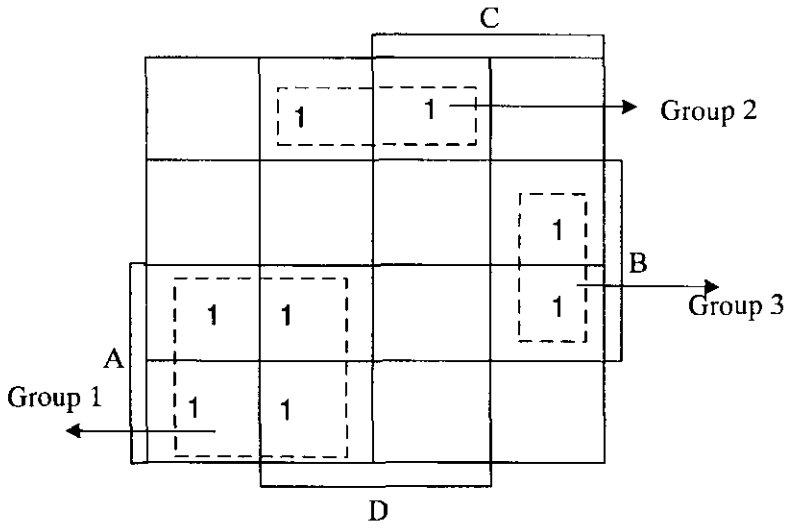


Rough work

The next THREE questions refer to the Karnaugh map below:



QUESTION 17
Which term represents Group 1?

1 A'C'
2 AC
3 AC'
4 A'

QUESTION 18
Which term represents Group 2?

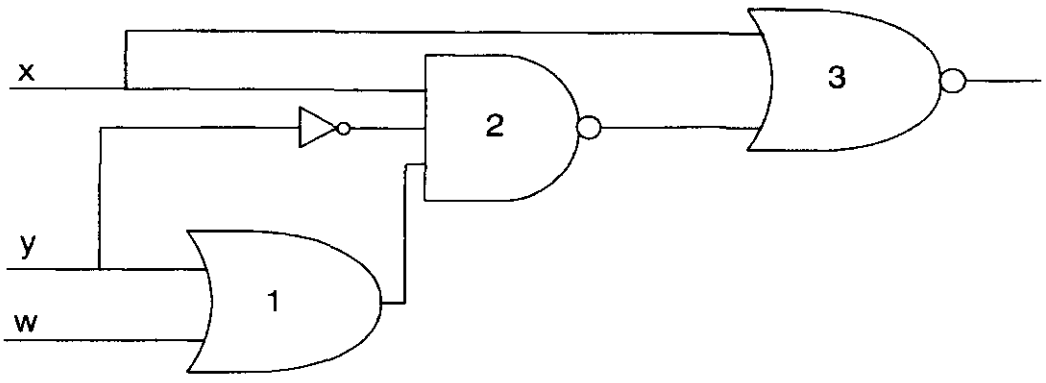
1 A'B'D
2 A'BD
3 BC'D
4 CD

QUESTION 19
Which term represents Group 3?

1 BCD'
2 BC'D'
3 A'BD
4 B'CD'

Rough work

The next THREE questions refer to the following combinational logic circuit:



QUESTION 20
What is the output of Gate 1?

1 y′ + w
2 yw
3 y′ + w′
4 y + w

QUESTION 21
What is the output of Gate 2?

1 $(y' + w) + y' + x$

2 $[(y \cdot w) + y' + x]'$

3 $[(y + w)\, y'\, x]'$

4 $(y' + w')\, y'\, x$

QUESTION 22
What is the output of Gate 3?

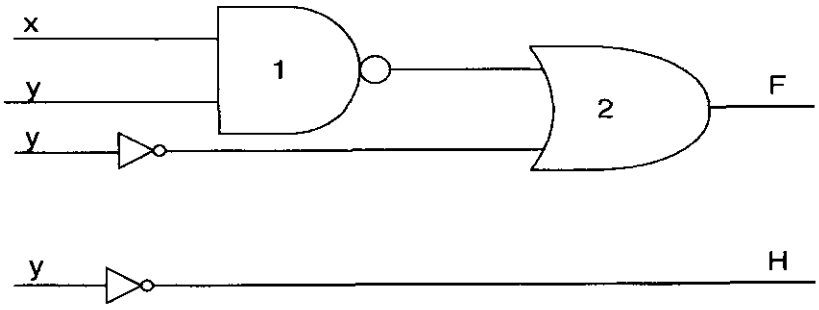
1 $\{[(y + w)\, y'\, x]' + x\}'$

2 $\{(y\, w) + y' + x]'\ \ x\}'$

3 $[(y' + w') \cdot y' \cdot x] \cdot x'$

4 $[(y' + w) + y' + x] \cdot x'$

QUESTION 23
Consider the following two logic circuits



These two logic circuits are not equivalent $F = (xy)' + y'$ and $H = y'$ One of the two gates can be changed so that the circuits can become equivalent Which gate can be changed and what kind of gate must it become?

1 Gate 2 must change to an AND gate
2 Gate 1 must change to an AND gate
3 Gate 2 must change to a NAND gate
4 Gate 1 must change to an OR gate

Rough work

Consider the following scenario:
Three people (A, B and C) are to board a ferry boat to cross a river

A weighs 70 kg; B weighs 40 kg; C weighs 20 kg.

If a person boards the boat, then the output for that person is 1 For example, if A = 0, B = 1 and C = 1, it means that only B and C boarded the boat

A Boolean function F(A,B,C) is defined as follows **F(A,B,C) = 1 when the total weight of the people who have boarded the ferry boat is more than 55 kg.** If this is not the case then F (A,B,C) = 0 Apart from any of these three people, it is assumed that no other parson can be on the boat

Different combination inputs for A, B and C are given in the tables provided in the following FOUR questions. The question to be answered in each case is: Which alternative shows the correct outputs for F?

QUESTION 24

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

QUESTION 25

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

QUESTION 26

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

QUESTION 27

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

Rough work

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

QUESTION 28

The ALU performs three types of operation on data Under which type of operation do the NOT, AND, OR and XOR operations fall?

1 Only shift
2 Logic
3 Only arithmetic
4 Shift and arithmetic

QUESTION 29

Which one of the following statements is NOT true about cache memory?

1 It is faster than main memory
2 It is slower than the CPU
3 It is faster than the registers
4 It contains a copy of a portion of main memory

QUESTION 30

Which of the following are possible categories of computer auxiliary storage devices?

1 Optical and magnetic
2 Volatile and electronic
3 Magnetic and non-volatile
4 Magnetic, volatile and electronic

QUESTION 31

A computer has 1024 MB of memory Each word in this computer is 64 bytes How many bits are needed to address any single word in memory?

1 25
2 26
3 23
4 24

QUESTION 32

In the fetch stage of the machine cycle used by the CPU, _____

1 the task order is sent to a component in the CPU
2 the contents of two input registers are added
3 instructions are decoded by the control unit
4 the address of the instruction to be copied is held in the program counter register

QUESTION 33

Which one of the following statements describes a property of RISC computer architecture?

1 A small set of instructions do a minimum number of simple operations
2 A complex instruction is transformed into a set of simple operations and then executed by the CPU
3 It is easier than other designs because there is a single instruction for both simple and complex tasks
4 Micromemory holds the set of operations for each complex instruction in the instruction set

QUESTION 34

There are four basic network topologies Which network topology has the following advantage and disadvantage?

Advantage Each connection can carry its own data load

Disadvantage The large amount of cabling and number of input/output ports required

1 Ring
2 Mesh
3 Bus
4 Star

QUESTION 35

What is the name of a central controller on which all the other computer network devices are connected using dedicated point-to-point links?

1 A backbone
2 A ring
3 A hub
4 A workstation

QUESTION 36

Which set of rules has been created by the Internet to divide the services needed to perform a task?

1 Links
2 Servers
3 Protocols
4 Packets

QUESTION 37

Which of the following is NOT a component of email architecture?

1 MTA server
2 MAA client
3 FTP protocol
4 UA

QUESTION 38

Which one of the following is NOT part of the client in the FTP model?

1 Control connection
2 User interface
3 Control process
4 Data transfer process

QUESTION 39

Which of the following is NOT a basic requirement for the WWW?

1 Web server
2 Host name
3 Browser
4 HTTP

QUESTION 40
Which one of the following statements regarding the evolution of computer operating systems and hardware is NOT TRUE?

1 Parallel operating systems required one CPU on one computer when they were first used
2 Batch operating systems were designed in the 1950s to control mainframe computers
3 In the 1950s computers used punched cards for input
4 Multiprogramming and time-sharing required the operating system to do scheduling

QUESTION 41
An operating system (OS) can be programmed in such way that its code is independent of the machine language of the computer on which it is running This property refers to the _____ of the OS

1 extensibility
2 reliability
3 compatibility
4 portability

QUESTION 42
_____ is multiprogramming without swapping

1 Demand paging
2 Demand segmentation
3 Paging
4 Queuing

QUESTION 43
In paging, the memory is divided into equally-sized sections called _____

1 segments
2 frames
3 threads
4 pages

QUESTION 44
Which of the following states, in computer program processing, can a job acquire?

1 hold and running
2 hold and terminate
3 ready and waiting
4 ready and running

QUESTION 45

Which major component of UNIX is regarded as the heart of the system and contains the most basic part of the operating system?

1 Kernel
2 Shell
3 Utilities
4 Applications

Section C: Computer algorithms, programming and software development

(18 marks)

QUESTION 46

A list contains the following elements

7 11 18 20 37 41 49 70 77 82 84 100 109

At the beginning, first = 1, mid = 7 and last = 13 What are the values of first, mid and last respectively after two iterations of the binary search algorithm if the goal is 37?

1 4, 5, 6
2 2, 5, 8
3 1, 3, 6
4 7, 10, 13

QUESTION 47

Suppose a list contains the following elements

55 71 16 33 65 48 83 24

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

1 16 24 33 55 65 48 83 71
2 16 71 55 33 65 48 83 24
3 16 24 55 33 65 48 83 71
4 16 24 33 55 48 65 71 83

Rough work

QUESTION 48

Certain constructs are needed for a structured program. Which construct tests a condition?

1 sequence
2 diversion
3 decision
4 repetition

QUESTION 49

Which one of the following is a pictorial representation of an algorithm?

1 Loop
2 Repetition
3 UML
4 Class

QUESTION 50

The step-by-step solution that expresses a logical solution to a particular problem of interest is called a(n) _____

1 computer program
2 process
3 program structure
4 algorithm

QUESTION 51

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

1 They are sub-units of main algorithms
2 They are can be called many times by the main algorithm
3 They are more difficult to understand than the main algorithm
4 They can be broken down into other sub-algorithms

QUESTION 52

The only language understood by computer hardware is _____ language

1 machine
2 symbolic
3 high-level
4 natural

QUESTION 53

Which translation analyzer parses a set of tokens to find instructions?

1 Lexical
2 Syntax
3 Semantic
4 Code generator

QUESTION 54

The development of _____ contributed to the effective solving of programming problems in the sense that it enables the programmer to focus on the logic of the problem to be solved, instead of focussing on the technical detail of the computer

1 the graphical user interface
2 high-level languages
3 compilers
4 text editors

QUESTION 55

In which two forms can a final program in Java be?

1 An application or a function
2 A function or a procedure
3 A procedure or an applet
4 An application or an applet

QUESTION 56

C++ uses the following principles

A encapsulation
B functionality
C polymorphism
D inheritance

Alternatives

1 Only A and C
2 Only A, C, and D
3 B and D
4 A, B and C

QUESTION 57

In the Scheme version of LISP, if

Names = (John Mathi Sipho Ruth Kali Busi Jonah), then (car (cdr (cdr Names)))

would give a result of

1 Mathi
2 Sipho
3 Ruth
4 Kali

QUESTION 58

One very popular model for the software development process is known as the waterfall model Which one of the following statements is NOT TRUE about this model?

1 The developers add more functionality until the existing system works properly
2 The development process flows in only one direction
3 The analysis phase of the whole project should be completed before its design phase is started
4 Each phase is completed before the next phase starts

QUESTION 59

Modelling tools used in procedure-oriented analysis, include

A dataflow diagrams
B entity-relationship diagrams
C use case diagrams
D state diagrams
E class diagrams
F state charts

Alternatives

1 A, B, and D
2 C, E and F
3 C, D and E
4 D, E and F

QUESTION 60

Modularity is _____

1 the encapsulation of data and methods
2 the division of a large program into smaller parts that can communicate with each other
3 a byproduct of inheritance
4 the same as cohesion

QUESTION 61

Maintainability is one of the measures for software quality Maintainability includes _____

1 portability
2 efficiency
3 changeability
4 reliability

QUESTION 62

The following statement regarding program testing is NOT TRUE

1 Control structure testing is a method used in black-box testing
2 Glass-box testing can be done by a software engineer or a dedicated team
3 Black-box testing tests the functionality of the software in terms of what it is supposed to accomplish
4 In glass-box testing (white-box testing), the internal structure of the software is known

QUESTION 63
What is the other name for Glass-box testing?

1 Exhaustive testing
2 Random testing
3 Black-box testing
4 White-box testing

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

QUESTION 64
Which one of the following is NOT a data structure?

1 Array
2 Record
3 Linked list
4 Index

QUESTION 65
An array is_____

1 a collection of fields that are all related to one object
2 a sequenced collection of elements, normally of the same data type
3 only one-dimensional
4 a collection of elements called fields

QUESTION 66
Which of the following operations can be defined on an array?

A Searching
B Deletion
C Retrieval
D Insertion

Alternatives
1 Only A and B
2 Only A, B and D
3 Only A, B and C
4 A, B, C and D

QUESTION 67
Which one of the following best describes a record?

1 A collection of data in which each element contains the location of next element
2 A file containing data, such as s file created within an application program
3 A collection of different elements that can be stored on different locations
4 A collection of related elements, possible of different types, having a single name

QUESTION 68
In an array we have two identifiers, name them

1 Data and link
2 Class and node
3 The Array of records and the data type
4 The name of the array and the name of each individual element

QUESTION 69
Which one of the following statements regarding linked lists is NOT TRUE?

1 The name of a linked list is the name of the head pointer that points to the last node of the list
2 A linked list is a suitable structure if a large number of insertions and deletions are needed
3 The same operations defined for an array can be applied to a linked list
4 A linked list can grow infinitely and shrink to an empty list

QUESTION 70
Which of the following best describe what a file?

1 It is always sequential, hashed and indexed
2 It is a very small record which is loaded in to main memory
3 It is how you retrieve information
4 It is an external collection of related data treated as a unit

QUESTION 71
A hashed file is a random access file in which a _____ maps a key to an address

1 transaction
2 function
3 relation
4 connection

QUESTION 72
Which one of the following is NOT a hashing method for hashed files?

1 Modulo division hashing
2 Direct hashing
3. Indirect hashing
4 Digital extraction hashing

QUESTION 73
Which UNIX directory is the highest level in the file system hierarchy?

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

QUESTION 74
What is binary file?

1 A randomly accessible sequence of file
2 A collection of related files stored in a secondary device
3 A collection of data of data stored in the internal format of the computer
4 A file of characters

QUESTION 75
In the open addressing collision resolution method,

1 data that cannot be stored in the home address can be stored in the next address
2 the first record is stored in the home address, but contains a pointer to the second record
3 bucket hashing is used
4 each collision resolution decreases the probability of future collisions

QUESTION 76
The database system has the following advantages as compared to the flat-file system EXCEPT

1 In a flat-file system there is a lot of redundancy
2 A database system is usually more efficient than a flat file system, because a piece of information is stored in fewer locations
3 In a database system it is easier to maintain data integrity, because a piece of information is stored in fewer locations
4 In a flat-file it is easier to maintain the confidentiality of the information

QUESTION 77

The total number of rows in a relation is called the _____ of the relation

1 degree
2 size
3 depth
4 cardinality

QUESTION 78

The _____ level of a database defines the logical view of the data

1 user
2 internal
3 conceptual
4 external

QUESTION 79

Which of the following databases are used in a distributed database model?

A Fragmented
B Replicated
C Repeated

Alternatives

1 Only A and B
2 Only A and C
3 Only B and C
4 A, B and C

QUESTION 80

Which one of the following is NOT classified as database model?

1 Distributed database
2 Relational databases
3 Normalised databases
4 Object-Oriented databases

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EXAMINATION MARK READING SHEET **EKSAMEN-MERKLEESBLAD**

PART 1 (GENERAL/ALGEMEEN) DEEL 1

1 STUDY UNIT e.g. PSY100-X / STUDIE EENHEID bv. PSY100-X

2 PAPER NUMBER / VRAESTELNOMMER

3 INITIALS AND SURNAME / VOORLETTERS EN VAN

4 DATE OF EXAMINATION / DATUM VAN EKSAMEN

5 EXAMINATION CENTRE (E.G. PRETORIA) / EKSAMENSENTRUM (BV. PRETORIA)

6 STUDENT NUMBER / STUDENTENOMMER

7 c0 c0 c0 c0 c0 c0 c0 c0 c0 c0
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8 UNIQUE PAPER NO / UNIEKE VRAESTEL NR.

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c8 c8 c8 c8 c8 c8
c9 c9 c9 c9 c9 c9

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