



Examination Answer Books

12 Pages

Instructions to Candidates

1. Please give the information requested in the boxes below.
2. Enter your name in the space provided to the right, fold over and seal down (using the label provided) to hide your name.
3. The answers must be legibly written. The Examiners can either ignore illegible script or have it typed and the expense of typing charged to the candidate.
4. Write your answers in ink.
5. Begin each answer on a fresh page. Do all rough work in the answer book and cross it through.
6. No part of this book is to be torn out; it must be handed in complete.
7. If more books than one are used, fasten them together using the tags available from the invigilator(s).
8. Every book must be handed in. In no circumstances may answer books, used or unused, be taken out of the examination venue.

1	Student Number	2517511
2	Title of Examination Paper	Computer Architecture and Operating Systems
3	Module Code	ACCA6022
4	Date and Time of Examination	11-5-26 2pm
5	Examination Venue	Room 310
6	Seat Number	12
7	Number of Answer Books handed in	1

List the numbers of the questions you have attempted	Office Use
1a	
1b	
1c	
1d	
1e	
1f	
1g	24
2a	03
2b	03
3a	03
4	00
Total	33

1.a) The number Systems allow us to Convert Different types of data between what Computers can understand, like binary, into the normal Base 10 number Systems people use.

1.b)

i) 245 in binary = 11110101

128	64	32	16	8	4	2	1
1	1	1	1	0	1	0	1

ii) 512 in binary = 1000000000

512	256	128	64	32	16	8	4	2	1
1	0	0	0	0	0	0	0	0	0

1.c)

i) 11010101 in base 10 = 213

128	64	32	16	8	4	2	1
1	1	0	1	0	1	0	1

$$128 + 64 + 0 + 16 + 0 + 4 + 0 + 1 = 213$$

ii) 101011001 in base 10 = 345

256	128	64	32	16	8	4	2	1
1	0	1	0	1	1	0	0	1

$$256 + 0 + 64 + 0 + 16 + 8 + 0 + 0 + 1 = 345$$

1.d) 0 1 2 3 4 5 6 7 8 9 A B C D E F

i) 1110 1010 1011 in Hex = D9A

$$1110 = 14 = D$$

8	4	2	1
1	1	1	0

$$1010 = 10 = 9$$

8	4	2	1
1	0	1	0

$$1011 = 11 = A$$

8	4	2	1
1	0	1	1

ii) 1001 1111 0010 in Hex = 8E1

0 1 2 3 4 5 6 7 8 9 A B C D E F
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

$$1001 = 9 = 8 \quad 1111 = 15 = E \quad 0010 = 2 = 1$$

8	4	2	1
1	0	0	1

8	4	2	1
1	1	1	1

8	4	2	1
0	0	1	0

1.e)

i) C3 in decimal = C = 13 3 = 4

0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

C = 13

3 = 4

ii) 66 in decimal = 7 and 7

 $6_{16} = 7$

1.f)

A 3-bit number can represent 8 unique values

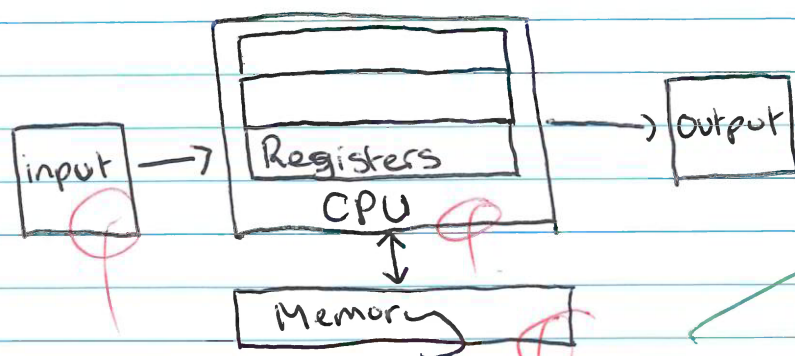
4 | 2 | 1

 $4 + 2 + 1 = 7$ including 0 would make
8 unique values

1.g)

To download a 36MB file with an internet
Speed of 80Mb/s would take 3.6 minutes $1024 \times 36 = 36,864 \text{ Bytes}$ ~~$36,864 \div 8 =$~~ $36,864 \times 8 = 294,912 \text{ bits}$ $294,912 \div 1024 = 288 \text{ Mb}$ $288 \div 80 = 3.6$

2.a)



2.b) Cache memory = Memory that the CPU uses to store data that is used frequently to increase speeds.

3.a) Hard disk drives typically use physical/mechanical components like disk plates and reader arms which spin at high velocities. They are typically slower than SSD's and physically bigger but are usually cheaper.

Solid State drives don't have any mechanical components inside. They usually run faster with higher read and write speeds and are smaller than HDD's though they can at times be very expensive.



Question No.

Examiner Only

4.a)

