

Vrije Universiteit, Faculteit Exacte Wetenschappen,
Afdeling Informatica

Herkansing Tentamen **Pervasive Computing**
8 Februari 2010

Dit is een gesloten boek tentamen.

Tijdens het tentamen mogen geen schriftelijke of elektronische artikelen worden geraadpleegd.

De antwoorden kunnen in het Nederlands of Engels gegeven worden.

Er zijn 5 tentamenvragen, Q1..Q5 en de som ervan is maximaal 90p.

Het tentamencijfer wordt berekend als: $(Q1+Q2+\dots+Q5+10)/100$

Het eindcijfer wordt berekend als $0.4 \cdot \text{practicum} + 0.6 \cdot \text{tentamen}$.

Beide onderdelen moeten ≥ 5.5 zijn voor een voldoende.

	Q1	Q2	Q3	Q4	Q5	ΣQ_i	Maximum = $(\Sigma Q_i + 10) / 10$
a)	5	5	5	10	10		
b)	10	10	10	5	5		
c)			5		5		
d)			5				
e)							
Totaal	15	15	25	15	20	90	10

SUCCES!

Q1. Ubiquitous computing vision. DEI model. [15p]

- ✓ a) [5p] Enumerate the 5 core Ubicom system properties according to the DEI model..
- b) [10p] Describe an ubicom system with at least 2 of the properties from a) that can enhance the public transport scenario.

Q2. Smart devices and services [15p]

- a) [5p] Enumerate the primary tasks of a smart card operating system
- b) [10p]. There are different service architecture models possible depending on how the A (access), P (processing), C (communication) and I (information) components are distributed. Describe shortly 2 possible models, show in both cases how are the A,P,C and I components distributed and give for both a real life example.

Q3. Tagging & sensing [25p]

- a) [5p] Compare passive and active RFID.
- b) [10p] What is a smart sensor? Draw a diagram and explain the role of each component.
- ✓ c) [5p] Explain how does Time of Arrival (ToA) method work.
- ✓ d) [5p] What is a hard real-time system? Give an example.

Q4. Intelligent systems [15p]

- ✓ a) [10p] Draw a diagram of a reactive intelligent system (R-IS) and explain how it works.
- ✓ b) [5p] Give an example of a R-IS.

Q5. Communication. [20p]

- ✓ a) [10p] What is a parity bit? Show how this works for example for uneven parity when the string "Test" is typed on the keyboard. ASCII table is provided.
- ✓ b) [5p] What is data rate? Calculate the data rate of a 2MHz square wave signal.
- ✓ c) [5p] What is a body area network? Give an example and draw a diagram.

2,5
2 5 55
5 50
5 45
10 10
5 30
5 25
5 20
5 15
10

C	Hx	Oct	Char	Dec	Hx	Oct	Html	Chr	Dec	Hx	Oct	Html	Chr	Dec	Hx	Oct	Html	Chr
0	00	00	NUL (null)	32	20	040	 	Space	64	40	100	@	@	96	60	140	`	`
1	00	01	SOH (start of heading)	33	21	041	!	!	65	41	101	A	A	97	61	141	a	a
2	00	02	STX (start of text)	34	22	042	"	"	66	42	102	B	B	98	62	142	b	b
3	00	03	ETX (end of text)	35	23	043	#	#	67	43	103	C	C	99	63	143	c	c
4	00	04	EOT (end of transmission)	36	24	044	$	\$	68	44	104	D	D	100	64	144	d	d
5	00	05	ENQ (enquiry)	37	25	045	%	%	69	45	105	E	E	101	65	145	e	e
6	00	06	ACK (acknowledge)	38	26	046	&	&	70	46	106	F	F	102	66	146	f	f
7	00	07	BEL (bell)	39	27	047	'	'	71	47	107	G	G	103	67	147	g	g
8	01	00	BS (backspace)	40	28	050	(	(	72	48	110	H	H	104	68	150	h	h
9	01	01	TAB (horizontal tab)	41	29	051	)	)	73	49	111	I	I	105	69	151	i	i
A	01	02	LF (NL line feed, new line)	42	2A	052	*	*	74	4A	112	J	J	106	6A	152	j	j
B	01	03	VT (vertical tab)	43	2B	053	+	+	75	4B	113	K	K	107	6B	153	k	k
C	01	04	FF (NP form feed, new page)	44	2C	054	,	,	76	4C	114	L	L	108	6C	154	l	l
D	01	05	CR (carriage return)	45	2D	055	-	-	77	4D	115	M	M	109	6D	155	m	m
E	01	06	SO (shift out)	46	2E	056	.	.	78	4E	116	N	N	110	6E	156	n	n
F	01	07	SI (shift in)	47	2F	057	/	/	79	4F	117	O	O	111	6F	157	o	o
10	02	00	DLE (data link escape)	48	30	060	0	0	80	50	120	P	P	112	70	160	p	p
11	02	01	DC1 (device control 1)	49	31	061	1	1	81	51	121	Q	Q	113	71	161	q	q
12	02	02	DC2 (device control 2)	50	32	062	2	2	82	52	122	R	R	114	72	162	r	r
13	02	03	DC3 (device control 3)	51	33	063	3	3	83	53	123	S	S	115	73	163	s	s
14	02	04	DC4 (device control 4)	52	34	064	4	4	84	54	124	T	T	116	74	164	t	t
15	02	05	NAK (negative acknowledge)	53	35	065	5	5	85	55	125	U	U	117	75	165	u	u
16	02	06	SYN (synchronous idle)	54	36	066	6	6	86	56	126	V	V	118	76	166	v	v
17	02	07	ETB (end of trans. block)	55	37	067	7	7	87	57	127	W	W	119	77	167	w	w
18	03	00	CAN (cancel)	56	38	070	8	8	88	58	130	X	X	120	78	170	x	x
19	03	01	EM (end of medium)	57	39	071	9	9	89	59	131	Y	Y	121	79	171	y	y
1A	03	02	SUB (substitute)	58	3A	072	:	:	90	5A	132	Z	Z	122	7A	172	z	z
1B	03	03	ESC (escape)	59	3B	073	;	;	91	5B	133	[	[	123	7B	173	{	{
1C	03	04	FS (file separator)	60	3C	074	<	<	92	5C	134	\	\	124	7C	174	|	
1D	03	05	GS (group separator)	61	3D	075	=	=	93	5D	135	]	]	125	7D	175	}	}
1E	03	06	RS (record separator)	62	3E	076	>	>	94	5E	136	^	^	126	7E	176	~	~
1F	03	07	US (unit separator)	63	3F	077	?	?	95	5F	137	_	_	127	7F	177		DI

Source: www.pubblinet.co

ASCII table

128 64 32 16 / 8 4 2 1
T = 0 1 1 0 0 1 0 0
6 1 1 0 0 1 0 1
6 1 1 0 0 1 1 1
0 1 1 0 1 0 1