

فيلسوف



Tanta University
Faculty of Science
Mathematics Department
(Computer Science Deviation)



Computer Security Final Term Exam (4th year)

2014-2015

Second Term

Time Allowed: 2 Hours

Solve the following questions

Question 1:

- a- Construct a Playfair matrix with the key "keyword" to encrypt the message "The Meeting was canceled".
- b- Encrypt the message "Top Secret" using the Hill cipher with the key $\begin{pmatrix} 1 & 4 \\ 5 & 3 \end{pmatrix}$. Show your calculations and the result.

Question 2:

- a- Draw steps of DES algorithm from plain text to cipher text.
- b- Mention how the subkey generated for each round in DES algorithm?
- c- What are the operations performed in each round in DES algorithm?

Question 3:

- a- "The number of rounds depends on the block size and the length of the key in AES algorithm". Explain this statement?
- b- What are the operations performed in each round in AES algorithm?

Good luck

TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF MATHEMATICS				
EXAMINATION FOR SENIORS STUDENTS (FOURTH YEAR) STUDENTS OF COMPUTER SCIENCE				
COURSE TITLE: TIME SERIES			COURSE CODE: ST4204	
DATE: 23-5-2015	JON,...	TERM: SECOND	TOTAL ASSESSMENT MARKS: 100	TIME ALLOWED: 2 HOURS

Answer the following questions (each question of 20 marks):

- 1- A- Define: 1- Irregular variation 2- Cyclic variation
 B- Deduce the parameters estimates \hat{a} , \hat{b} for the exponential trend model $y = ae^{bt}$.

- 2- For the following data calculate the quadratic model and the trend value of 1990 :

t	1980	1981	1982	1983	1984
y	12	10	11	13	9

- 3- A - Using the method of semi average to obtain the trend values for the following data by taking the average as the mean :

year	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
data	9.74	9.26	8.86	8.25	7.81	8.01	7.55	7.24	7.01	6.88	7.03

- B.-Consider the following data:

time	1990	1991	1992	1993	1994	1995	1996
sales	2	4	7	1	2	3	5

- 1- Obtain the fourth order moving average. 2- Find the third order moving median.

- 4- For the following data calculate the seasonal index and the adjusted data:

season	1994	1995	1996
Summer	6.2	6.5	6.4
Winter	8.1	7.9	8.3
Autumn	8	8.2	7.9
Spring	7.2	7.7	7.5

- 5- Calculate the weighted index number for the following data :

item	1995		2000	
	price	quantity	price	quantity
A	2	20	3	21
B	18	3	36	2
C	3	18	4	23

EXAMINERS	PROF. DR./	DR/ ADEL EDRESS
	DR/	DR/

With my best wishes



COURSE TITLE:	IMAGE PROCESSING	COURSE CODE: C4206
DATE:	27/5/2015	TERM: SECOND
TOTAL ASSESSMENT MARKS: 100	TIME ALLOWED: 2 HOURS	

Question No 1: [Total marks: 60]

1. Consider the 8-bit grey-scale image:

$$\begin{bmatrix} 52 & 85 & 61 \\ 63 & 59 & 70 \\ 122 & 154 & 68 \end{bmatrix}$$

For this image find the following:

- The stretched scale s_{st} .
- The equalized scale s_{eq} .
- Response R by linear filtering with 3×3 mask. [Hint: use padding image by adding rows and columns of 0's on the boundary]

0.23	0.23	0.23
0.23	0.23	0.23
0.23	0.23	0.23

Question No 2: [Total marks: 20]

- What are the three basic gray level functions that are used for image enhancement? Then compare among them with respect to their curves. (5 marks)
- Consider the color image with RGB values as follows: (15 marks)

$$\begin{bmatrix} (100,100,100) & (150,0,0) & (0,150,0) \\ (255,0,0) & (255,255,255) & (0,0,0) \\ (100,150,200) & (0,0,255) & (100,200,150) \end{bmatrix}$$

For this image find the following:

- HSI value of pixel (100,150,200).
- HSI value of pixel (100,200,150).

Question No 3: [Total marks: 20]

- Choose the best answer for each of the following points: (10 marks)
 - In enhancement domains, when we use the techniques that are based on direct manipulation of pixels in an image, we call these domains:
 - Spatial domain
 - Frequency domain
 - Both a and b
 - None of the above
 - An image is enhanced when we do the following modification:
 - Removing the additive noise and interference.
 - Increasing its contrast.
 - Decreasing its blurring.
 - All of the above
 - When the components of histogram are concentrated on the low side of the gray scale, the image will be:
 - Dark
 - Bright
 - Low-contrast
 - High-contrast

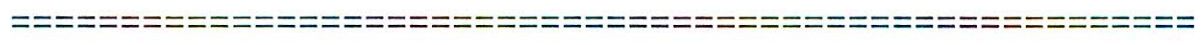
انظر خلفه



- iv. Which of the following is true about the median filter?
 - a. Sort all neighborhood pixels in increasing order
 - b. Effective in presence of impulse noise
 - c. Replace value of center pixel by median of gray levels in neighborhood
 - d. All of the above

- v. To describe any color we use three independent quantities:
 - a. Radiance, luminance, and brightness
 - b. Red, green, and blue
 - c. Hue, saturation, and intensity
 - d. None of the above

2. Put (√) or (×) in end of each of the following sentences: (10 marks)
- i. Principal objective of enhancement is to modify attributes of an image to make it more suitable for a given task and a specific observer.
 - ii. The chromaticity for a given color depends on its hue and saturation values.
 - iii. In the RGB system, each color appears in its primary spectral components of red, green, and blue.
 - iv. In spatial filtering, the masks are usually of even size.
 - v. In spatial domain we use techniques based on modifying Fourier transform of an image.



End of examination
With our best wishes

EXAMINERS	DR. MOSAAD WAJEH HASSAN	DR. IBRAHIM YOUNESS
		

Critical values of the F Distribution at $\alpha = 0.05$

df2/df1	1	2	3	4	5	6	7	8	9	10	12	15	20	24	30	40	60	120	INF
1	161	200	216	225	230	234	237	239	241	242	244	246	248	249	250	251	252	253	254
2	18.5	19.0	19.2	19.2	19.3	19.3	19.4	19.4	19.4	19.4	19.4	19.4	19.4	19.5	19.5	19.5	19.5	19.5	19.5
3	10.1	9.55	9.28	9.12	9.01	8.94	8.89	8.85	8.81	8.79	8.74	8.70	8.66	8.64	8.62	8.59	8.57	8.55	8.53
4	7.71	6.94	6.59	6.39	6.26	6.16	6.09	6.04	6.00	5.96	5.91	5.86	5.80	5.77	5.75	5.72	5.69	5.66	5.63
5	6.61	5.79	5.41	5.19	5.05	4.95	4.88	4.82	4.77	4.74	4.68	4.62	4.56	4.53	4.50	4.46	4.43	4.40	4.37
6	5.99	5.14	4.76	4.53	4.39	4.28	4.21	4.15	4.10	4.06	4.00	3.94	3.87	3.84	3.81	3.77	3.74	3.70	3.67
7	5.59	4.74	4.35	4.12	3.97	3.87	3.79	3.73	3.68	3.64	3.57	3.51	3.44	3.41	3.38	3.34	3.30	3.27	3.23
8	5.32	4.46	4.07	3.84	3.69	3.58	3.50	3.44	3.39	3.35	3.28	3.22	3.15	3.12	3.08	3.04	3.01	2.97	2.93
9	5.12	4.26	3.86	3.63	3.48	3.37	3.29	3.23	3.18	3.14	3.07	3.01	2.94	2.90	2.86	2.83	2.79	2.75	2.71
10	4.96	4.10	3.71	3.48	3.33	3.22	3.14	3.07	3.02	2.98	2.91	2.85	2.77	2.74	2.70	2.66	2.62	2.58	2.54
11	4.84	3.98	3.59	3.36	3.20	3.09	3.01	2.95	2.90	2.85	2.79	2.72	2.65	2.61	2.57	2.53	2.49	2.45	2.40
12	4.75	3.89	3.49	3.26	3.11	3.00	2.91	2.85	2.80	2.75	2.69	2.62	2.54	2.51	2.47	2.43	2.38	2.34	2.30
13	4.67	3.81	3.41	3.18	3.03	2.92	2.83	2.77	2.71	2.67	2.60	2.53	2.46	2.42	2.38	2.34	2.30	2.25	2.21
14	4.60	3.74	3.34	3.11	2.96	2.85	2.76	2.70	2.65	2.60	2.53	2.46	2.39	2.35	2.31	2.27	2.22	2.18	2.13
15	4.54	3.68	3.29	3.06	2.90	2.79	2.71	2.64	2.59	2.54	2.48	2.40	2.33	2.29	2.25	2.20	2.16	2.11	2.07
16	4.49	3.63	3.24	3.01	2.85	2.74	2.66	2.59	2.54	2.49	2.42	2.35	2.28	2.24	2.19	2.15	2.11	2.06	2.01
17	4.45	3.59	3.20	2.96	2.81	2.70	2.61	2.55	2.49	2.45	2.38	2.31	2.23	2.19	2.15	2.10	2.06	2.01	1.96
18	4.41	3.55	3.16	2.93	2.77	2.66	2.58	2.51	2.46	2.41	2.34	2.27	2.19	2.15	2.11	2.06	2.02	1.97	1.92
19	4.38	3.52	3.13	2.90	2.74	2.63	2.54	2.48	2.42	2.38	2.31	2.23	2.16	2.11	2.07	2.03	1.98	1.93	1.88
20	4.35	3.49	3.10	2.87	2.71	2.60	2.51	2.45	2.39	2.35	2.28	2.20	2.12	2.08	2.04	1.99	1.95	1.90	1.84
21	4.32	3.47	3.07	2.84	2.68	2.57	2.49	2.42	2.37	2.32	2.25	2.18	2.10	2.05	2.01	1.96	1.92	1.87	1.81
22	4.30	3.44	3.05	2.82	2.66	2.55	2.46	2.40	2.34	2.30	2.23	2.15	2.07	2.03	1.98	1.94	1.89	1.84	1.78
23	4.28	3.42	3.03	2.80	2.64	2.53	2.44	2.37	2.32	2.27	2.20	2.13	2.05	2.01	1.96	1.91	1.86	1.81	1.76
24	4.26	3.40	3.01	2.78	2.62	2.51	2.42	2.36	2.30	2.25	2.18	2.11	2.03	1.98	1.94	1.89	1.84	1.79	1.73
25	4.24	3.39	2.99	2.76	2.60	2.49	2.40	2.34	2.28	2.24	2.16	2.09	2.01	1.96	1.92	1.87	1.82	1.77	1.71
26	4.23	3.37	2.98	2.74	2.59	2.47	2.39	2.32	2.27	2.22	2.15	2.07	1.99	1.95	1.90	1.85	1.80	1.75	1.69
27	4.21	3.35	2.96	2.73	2.57	2.46	2.37	2.31	2.25	2.20	2.13	2.06	1.97	1.93	1.88	1.84	1.79	1.73	1.67
28	4.20	3.34	2.95	2.71	2.56	2.45	2.36	2.29	2.24	2.19	2.12	2.04	1.96	1.91	1.87	1.82	1.77	1.71	1.65
29	4.18	3.33	2.93	2.70	2.55	2.43	2.35	2.28	2.22	2.18	2.10	2.03	1.94	1.90	1.85	1.81	1.75	1.70	1.64
30	4.17	3.32	2.92	2.69	2.53	2.42	2.33	2.27	2.21	2.16	2.09	2.01	1.93	1.89	1.84	1.79	1.74	1.68	1.62

EXAMINERS

DR. ABD EL-MONEM ANWAR

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DR. MOHAMED M. EZZAT

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Chi Square Distribution

df	0.1	0.05	0.025	0.01	0.005	0.0025	0.001	0.0005
1	2.71	3.84	5.02	6.63	7.88	9.14	10.83	12.12
2	4.61	5.99	7.38	9.21	10.6	11.98	13.82	15.2
3	6.25	7.81	9.35	11.34	12.84	14.32	16.27	17.73
4	7.78	9.49	11.14	13.23	14.86	16.42	18.47	20
5	9.24	11.07	12.83	15.09	16.75	18.39	20.51	22.11
6	10.64	12.53	14.45	16.81	18.55	20.25	22.46	24.1
7	12.02	14.07	16.01	18.48	20.28	22.04	24.32	26.02
8	13.36	15.51	17.53	20.09	21.95	23.77	26.12	27.87
9	14.68	16.92	19.02	21.67	23.59	25.46	27.83	29.67
10	15.99	18.31	20.48	23.21	25.19	27.11	29.59	31.42
11	17.29	19.68	21.92	24.72	26.76	28.73	31.26	33.14
12	18.55	21.03	23.34	26.22	28.3	30.32	32.91	34.82
13	19.81	22.36	24.74	27.69	29.82	31.88	34.53	36.48
14	21.06	23.68	26.12	29.14	31.32	33.43	36.12	38.11
15	22.31	25	27.49	30.58	32.8	34.95	37.7	39.72
16	23.54	26.3	28.85	32	34.27	36.46	39.25	41.31
17	24.77	27.59	30.19	33.41	35.72	37.95	40.79	42.88
18	25.99	28.87	31.53	34.81	37.16	39.42	42.31	44.43
19	27.2	30.14	32.85	36.19	38.58	40.88	43.82	45.97
20	28.41	31.41	34.17	37.57	40	42.34	45.31	47.5
21	29.62	32.67	35.48	38.93	41.4	43.78	46.8	49.01
22	30.81	33.92	36.78	40.29	42.8	45.2	48.27	50.51
23	32.01	35.17	38.08	41.64	44.18	46.62	49.73	52
24	33.2	36.42	39.36	42.98	45.56	48.03	51.18	53.48
25	34.38	37.65	40.65	44.31	46.93	49.44	52.62	54.95
26	35.56	38.89	41.92	45.64	48.29	50.83	54.05	56.41
27	36.74	40.11	43.19	46.96	49.64	52.22	55.48	57.86
28	37.92	41.34	44.46	48.28	50.99	53.59	56.89	59.3
29	39.09	42.56	45.72	49.59	52.34	54.97	58.3	60.73
30	40.26	43.77	46.98	50.89	53.67	56.33	59.7	62.16
40	51.81	55.76	59.34	63.69	66.77	69.7	73.4	76.09
50	63.17	67.5	71.42	76.15	79.49	82.66	86.66	89.56
60	74.4	79.08	83.3	88.38	91.95	95.34	99.61	102.7
100	118.5	124.3	129.6	135.8	140.2	144.3	149.4	153.2

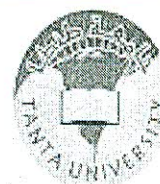
Student's t Distribution

df	0.1	0.05	0.025	0.01	0.005	0.0025	0.001	0.0005
1	3.078	6.314	12.71	31.82	63.66	127.3	318.3	636.6
2	1.886	2.92	4.303	6.965	9.925	14.09	22.33	31.6
3	1.638	2.353	3.182	4.541	5.841	7.453	10.21	12.92
4	1.533	2.132	2.776	3.747	4.604	5.598	7.173	8.61
5	1.476	2.015	2.571	3.365	4.032	4.773	5.893	6.869
6	1.44	1.943	2.447	3.143	3.707	4.317	5.208	5.959
7	1.415	1.895	2.365	2.998	3.499	4.029	4.785	5.408
8	1.397	1.86	2.306	2.896	3.355	3.833	4.501	5.041
9	1.383	1.833	2.262	2.821	3.25	3.69	4.297	4.781
10	1.372	1.812	2.228	2.764	3.169	3.581	4.144	4.587
11	1.363	1.796	2.201	2.718	3.106	3.497	4.025	4.437
12	1.356	1.782	2.179	2.681	3.055	3.428	3.93	4.318
13	1.35	1.771	2.16	2.65	3.012	3.372	3.852	4.221
14	1.345	1.761	2.145	2.624	2.977	3.326	3.787	4.14
15	1.341	1.753	2.131	2.602	2.947	3.286	3.733	4.073
16	1.337	1.746	2.12	2.583	2.921	3.252	3.686	4.015
17	1.333	1.74	2.11	2.567	2.898	3.222	3.646	3.965
18	1.33	1.734	2.101	2.552	2.878	3.197	3.611	3.922
19	1.328	1.729	2.093	2.539	2.861	3.174	3.579	3.883
20	1.325	1.725	2.086	2.528	2.845	3.153	3.552	3.85
21	1.323	1.721	2.08	2.518	2.831	3.135	3.527	3.819
22	1.321	1.717	2.074	2.508	2.819	3.119	3.505	3.792
23	1.319	1.714	2.069	2.5	2.807	3.104	3.485	3.768
24	1.318	1.711	2.064	2.492	2.797	3.091	3.467	3.745
25	1.316	1.708	2.06	2.485	2.787	3.078	3.45	3.725
26	1.315	1.706	2.056	2.479	2.779	3.067	3.435	3.707
27	1.314	1.703	2.052	2.473	2.771	3.057	3.421	3.69
28	1.313	1.701	2.048	2.467	2.763	3.047	3.408	3.674
29	1.311	1.699	2.045	2.462	2.756	3.038	3.396	3.659
30	1.31	1.697	2.042	2.457	2.75	3.03	3.385	3.646
40	1.303	1.684	2.021	2.423	2.704	2.971	3.307	3.551
50	1.295	1.676	2.009	2.403	2.678	2.937	3.261	3.496
60	1.296	1.671	2	2.39	2.66	2.915	3.232	3.46
inf.	1.282	1.64	1.96	2.326	2.576	2.807	3.091	3.291

31915



Tanta University
Faculty of Science
Mathematics Department
(Computer Science Deviation)



Computer Networks Final Term Exam (4 th year)		
2014-2015	Second Term	Time Allowed: 2 Hours

Solve the following questions


- Which of the following OSI layers offers reliable, connection-oriented data communication services?
a. application b. presentation c. session
d. transport e. network
- Router interface Ethernet 0 has been assigned the IP address 10.172.192.168 255.255.255.240. What is the network IP address of this interface?
a. 10.0.0.0 b. 10.172.0.0 c. 10.172.192.0
d. 10.172.192.160 e. 10.172.192.168 f. 10.172.192.175
- Which device is used to connect LANs that are geographically separated?
a. hub b. bridge c. router d. repeater
- How is data encapsulated as it is moved down the OSI model?
a. data, segments, frames, packets, bits
b. data, packets, segments, frames, bits
c. data, segments, packets, frames, bits
d. data, packets, frames, segments, bits
- Which type of address is 192.168.17.111/28?
a. host address b. network address
c. broadcast address d. multicast address
- During the data encapsulation process, how is the data broken down by the transport layer?
a. packets b. segments c. data bits d. frames
- During data transfer, what are the main responsibilities of the receiving host? (Choose two.)
a. throughput b. encapsulation c. acknowledgment
d. bandwidth e. segmentation f. reassembly
- Which of the following protocols use TCP? (Choose two.)
a. FTP b. DHCP c. TFTP d. HTTP e. SYN
- What is the purpose of TCP/UDP port numbers?
a. indicate the beginning of a three-way handshake
b. reassemble the segments into the correct order
c. identify the number of data packets that may be sent without acknowledgment
d. track different conversations crossing the network at the same time
- TCP/IP connection-oriented sessions begin with a three-way handshake. Which items describe the handshake process? (Choose three.)
a. acknowledge b. synchronize c. encapsulate
d. negotiate e. create f. propagate
- Which type of address is 192.168.17.134/29?
a. host address b. network address
c. broadcast address d. multicast address

12. Determine the number of useable networks and hosts for the IP address 192.168.50.0/27
 - a. 4 networks / 62 hosts
 - b. 6 networks / 64 hosts
 - c. 32 networks / 8 hosts
 - d. 6 networks / 30 hosts
 - e. 8 networks / 32 hosts
 - f. 2 networks / 8 hosts
13. Which of the following subnet masks could be used when subnetting a Class B IP address? (Choose two.)
 - a. 255.0.0.0
 - b. 255.255.0.0
 - c. 255.192.255.0
 - d. 255.224.0.0
 - e. 255.255.252.0
 - f. 255.255.255.128
14. Which of the following are characteristics of IP? (Choose three.)
 - a. connection-oriented protocol
 - b. connectionless protocol
 - c. reliable protocol
 - d. unreliable protocol
 - e. routed protocol
 - f. routing protocol
15. Which of the following describes a physical full-mesh topology?
 - a. It requires termination at both ends of the cable.
 - b. It uses a hub or a switch as a central point to connect all wires.
 - c. It provides maximum connectivity between all network systems.
 - d. It links all computers to a main computer that controls all traffic on the network.
16. What are features of the TCP/IP Transport layer? (Choose two.)
 - a. path determination
 - b. handles representation, encoding and dialog control
 - c. uses TCP and UDP protocols
 - d. packet switching
 - e. reliability, flow control and error correction
17. Which OSI layer encapsulates data into packets?
 - a. session
 - b. transport
 - c. network
 - d. data link
18. Which OSI layer defines the functions of a router?
 - a. physical
 - b. data link
 - c. network
 - d. transport
 - e. session
19. A company with a Class B license needs to have a minimum of 1,000 subnets with each subnet capable of accommodating 50 hosts. Which mask below is the appropriate one?
 - a. 255.255.0.0
 - b. 255.255.240.0
 - c. 255.255.255.0
 - d. 255.255.255.192
 - e. 255.255.255.224
20. A small company has a class C network license and needs to create five usable subnets, each subnet capable of accommodating at least 20 hosts. Which of the following is the appropriate subnet mask?
 - a. 255.255.255.0
 - b. 255.255.255.192
 - c. 255.255.255.224
 - d. 255.255.255.240
21. Which protocol functions at the internet layer of the TCP/IP protocol suite?
 - a. File Transfer Protocol (FTP)
 - b. Trivial File Transfer Protocol (TFTP)
 - c. Transmission Control Protocol (TCP)
 - d. Internet Protocol (IP)
 - e. User Datagram Protocol (UDP)
 - f. Simple Mail Transport Protocol (SMTP)
22. Which part of an IP address identifies a specific device on a network?
 - a. first two octets
 - b. third and fourth octets
 - c. network portion
 - d. host portion
 - e. only the fourth octet
23. Which physical network topology uses a single backbone cable and connects all hosts directly to this cable?
 - a. ring
 - b. star
 - c. bus
 - d. mesh

24. Which of the following are features of the Internet Protocol (IP)? (Choose two.)
- It is the most widely implemented global addressing scheme.
 - It allows two hosts to share a single address on a local area network.
 - It is a hierarchical addressing scheme allowing addresses to be grouped.
 - It is only locally significant, used primarily on local area networks.
25. Which of the following protocols operate at the application layer of the OSI model? (Choose two.)
- FTP
 - TCP
 - UDP
 - HTTP
26. What does TCP use to begin the three-way handshaking process?
- The destination host sends an ACK segment.
 - The sending host sends a SYN segment.
 - The sending host sends a SYN and ACK segment.
 - The destination host sends a SYN segment.
27. Which of the following describes the operation of TCP window size?
- Window size increases as all data transfers.
 - Window size is the TCP process used prepare data for transmission.
 - Window size is decreased if packets are lost.
 - Window size of 15 means that the next byte expected is byte number 15.
28. At which layer of the TCP/IP model does Telnet operate?
- application
 - presentation
 - session
 - transport
 - internet
 - network access
29. Which processes occur each time a packet is switched from one router interface to another? (Choose two.)
- encapsulation
 - ARP
 - RARP
 - de-encapsulation
 - circuit switching
 - FastForward switching
30. Which of the following are benefits of subnetting? (Choose three.)
- smaller broadcast domains
 - larger collision domains
 - low-level security provided
 - fewer broadcast domains
 - increased address flexibility
 - larger broadcast domains
31. Which of the following physical topologies connects all cables to a central point of concentration?
- ring
 - star
 - mesh
 - bus
32. What are the features of the User Datagram Protocol (UDP). (Choose three.)
- no guaranteed delivery of datagrams
 - connection-oriented
 - provides reliable full-duplex data transmission
 - reliability provided by the application layer
 - connectionless
 - utilizes sliding windowing techniques
33. Given a host with the IP address 172.32.65.13 and a default subnet mask, to which network does the host belong?
- 172.32.65.0
 - 172.32.65.32
 - 172.32.0.0
 - 172.32.32.0
34. How many bits are available for Class B host IP addresses using the default subnet mask?
- 1
 - 4
 - 8
 - 14
 - 16
 - 24

35. Which two statements are accurate about subnet addressing? (Choose two.)
- Host bits are all equal to 1 in the network address.
 - Host bits of the network address are all equal to 0.
 - Network address host bits are equal in value to the value of the fourth octet of the subnet mask.
 - Host bits of the broadcast address are all equal to 1.
 - Host bits of the broadcast address are all equal to 0.
 - Host bits of the broadcast address are equal in value to the value of the fourth octet of the subnet mask.
36. How many usable subnets are created by applying the subnet mask 255.255.255.0 to a Class B network?
- 256
 - 255
 - 254
 - 512
 - 511
 - 510
37. End systems use port numbers to select the proper application. What is the smallest port number that can be dynamically assigned by a host system?
- 1
 - 64
 - 128
 - 256
 - 512
 - 1024
38. Which protocols are commonly parts of the application layer of the TCP/IP model? (Choose three.)
- FTP
 - DNS
 - UDP
 - TCP
 - HTTP
39. Which process do routers use to determine the subnet network address based upon a given IP address and subnet mask?
- binary adding
 - hexadecimal adding
 - binary division
 - binary multiplication
 - binary ANDing
40. Company XYZ uses a network address of 192.168.4.0. It uses the mask of 255.255.255.224 to create subnets. What is the maximum number of usable hosts in each subnet?
- 6
 - 14
 - 30
 - 62
41. Which are the network and broadcast addresses when given an IP host address of 198.101.6.55/28? (Choose two.)
- 198.101.6.0
 - 198.101.6.32
 - 198.101.6.48
 - 198.101.6.57
 - 198.101.6.63
 - 198.101.6.255
42. Which of the following is the official name for the address assigned to each network interface card (NIC) by its manufacturer?
- NIC address
 - MAC address
 - IP address
 - Source Address
43. Which features allow TCP to reliably and accurately transport and regulate the flow of information from source to destination? (Choose three.)
- sliding windows
 - buffers
 - asynchronization
 - sequencing numbers
 - acknowledgments
 - segmentation
44. Which of the following are ways that bandwidth is commonly measured? (Choose three.)
- GHzps
 - kbps
 - Mbps
 - Nbps
 - MHzps
 - Gbps
45. Which protocol is used by FTP to transfer files over the Internet?
- TCP
 - SMTP
 - UDP
 - SNMP

Good luck

 1969	TANTA UNIVERSITY FACULTY OF SCIENCE DEPARTMENT OF MATHEMATICS		
	EXAMINATION FOR SENIORS (FOURTH YEAR) STUDENTS OF COMPUTER SCIENCE		
COURSE TITLE:	NEURAL NETWORKS	COURSE CODE: C4214	
DATE:	13/6/2015	TERM: SECOND	TOTAL ASSESSMENT MARKS: 100 TIME ALLOWED: 2 HOURS

Question No 1: [Total marks: 40]

1. Compare between autoassociation and heteroassociation. (8 marks)
2. What are the two phases involved in associative memory operation? (2 marks)
3. Assume that you want to learn a perceptron to perform a binary NAND function on inputs x_1 and x_2 . The training sample introduced to perceptron has the form $((x_0, x_1, x_2), z)$ where x_0, x_1, x_2 are inputs with input $x_0 = 1$ and z is the desired output. Let the threshold $t = 0.5$, Bias $b = 0$, and Learning rate $r = 0.1$. The training set consists of four samples: $\{(1,0,0),1), ((1,0,1),1), ((1,1,0),1), ((1,1,1),0)\}$. (30 marks)
 - a. Apply the weight vector adapting algorithm to update the weight vector with initial weight vector $(w_0, w_1, w_2) = (0.7, -0.2, -0.1)$.
[Hint: you can perform the computations in table]
 - b. What are the solution vector, n_0 , and n_{max} ?
[Hint: n_0 is the iteration of perceptron convergence and n_{max} is the maximum iteration that the adaptation process must be terminated after it]

Question No 2: [Total marks: 40]

1. Define Rosenblatt's perceptron. What is its goal? What is its classification decision rule? What is the sufficient condition for perceptron? What are the components of perceptron? (10 marks)
2. Explain the two rules that the weight vector adapting algorithm of perceptron is based on. (10 marks)
3. State the fixed-increment convergence theorem for perceptron. (5 marks)
4. Explain in brief the four major processes that the algorithm responsible for the formation of self-organizing map precedes by them. (15 marks)

Question No 3: [Total marks: 20]

1. Choose the best answer for each of the following points: (10 marks)
 - i. Principal goal of the self-organizing map (SOM) is:
 - a. Transform an input pattern of arbitrary dimension into a one- or two-dimensional discrete map.
 - b. Perform transformation adaptively in a topologically ordered fashion
 - c. both a and b
 - d. none of the above
 - ii. Which of the following is true about self-organizing map?
 - a. is type of ANN that is trained using unsupervised learning to produce map.
 - b. consists of components called nodes or neurons.
 - c. describes mapping from input space to map space.
 - d. all of the above

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- iii. Basic learning task that involves associating a new pattern with a stored pattern, is called:
 - a. pattern association
 - b. pattern recognition
 - c. pattern quantization
 - d. none of the above
- iv. The set of patterns sharing common attributes is called:
 - a. pattern sampling
 - b. pattern quantization
 - c. pattern class
 - d. none of the above
- v. Learning with teacher include:
 - a. supervised learning
 - b. reinforcement learning
 - c. both a and b
 - d. none of the above

2. Put (√) or (×) in end of each of the following sentences: (10 marks)

- i. In self organization process the training precedes with labeled input data.
- ii. Gaussian neighborhood function used in cooperative process in SOM algorithm is independent of the location of winning neuron.
- iii. Neural network is said to be fully connected if every node in input layer is connected to every other node in all layers.
- iv. The principle motivation for Kohonen's network model is the location of an output neuron in a topographic map corresponds to a particular domain or feature of data drawn from the input space.
- v. The absence of feedback loops has a profound impact on the learning capability of the network and on its performance.

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End of examination
With our best wishes

EXAMINERS	DR. MOSAAD WAJEH HASSAN	DR. ABD EL-MONEM KOZAE
		



Tanta University
Faculty of Science
Department of Mathematics

Final term exam for the second semester 2014-2015

Course title:	Optimal control (2)	Course code: MA4224
Date: 16 /6/2015	Total Marks: 100	Time allowed: 2 Hours

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Answer all the following questions:

First question: (25 Marks)

(a) Find a necessary condition for a function to be an extremal for the functional

$$J(x) = \int_{t_0}^{t_f} F(x(t), \dot{x}(t), t) dt$$

Where $t_0, x(t_0)$, and t_f are specified, and $x(t_f)$ is free.

(b) Prove that the Euler equation can be

$$F_x - F_{\dot{x}} - F_{xx} x(t) - F_{\dot{x}\dot{x}} \dot{x}(t) = 0$$

(c) Optimize $J(x) = \int_{t_0}^{t_f} (3x^2 e^{5t} + 4t^3 \dot{x}) dt$ s.t. $x(t_0) = x_0, x(t_f) = x_f$.

Second question: (20 Marks)

(a) Find the extremals of the fixed end point problem corresponding to the

Functional $J = \int_0^{\frac{\pi}{2}} (2x_1 x_2 - 2x_1^2 + x_1^2 - x_2^2) dt$ subject to boundary conditions

$$x_1(0) = 0, x_1\left(\frac{\pi}{2}\right) = 1, x_2(0) = 0, x_2\left(\frac{\pi}{2}\right) = 1.$$

(b) Using Lagrange multiplier method to find extremum values of functional

$J = \int_0^T (x^2 + u^2) dt$ s.t. $\dot{x} + x = u$ and $x(0) = x_0, x(t_f) = 0$.

Third question: (35 Marks)

(a) State and prove the Bellman Jacobi equation?

(b) Show that the Bellman Jacobi equation is equivalent to maximum relations for optimal control.

(c) Consider a first-order system $\dot{x}(t) = x(t) + u(t)$ and the performance

index $J = \frac{1}{4} x^2(t_f) + \frac{1}{4} \int_0^T u^2(t) dt$. Find

1- Find Bellman Jacobi equation.

2- Find optimal control.

P.T.O.

Fourth question: (20 Marks)

(a) Using Hamiltonian method to solve the following optimal control problem

$$J = \frac{1}{2} \int_0^1 u^2 dt \quad \text{s.t. } \dot{x}_1 = x_2, \quad \dot{x}_2 = u \quad \text{and } x_1(0) = 1, \quad x_1(1) = 0, \quad x_2(0) = 1$$

but $x_2(1)$ is not specified.

(b) Determine the variation of the functional :

$$J(x) = \int_{t_0}^{t_f} \left[x^3(t) - x^2(t) \dot{x}(t) \right] dt$$

(Best wishes)

Examiners:

1- Prof. Dr. E. Youness

2- Dr. N. El-Kholy