



جامعة كفرالشيخ - كلية الهندسة - قسم الهندسة الكهربائية

امتحان نهاية الفصل الاول للعام الجامعي 2018-2019

الممتحن: د/علي صقر يوم الامتحان : 2018/12/30

المادة: -تصميم خوارزمات الحاسب الفرقة 3 حاسبات الدرجة من 90 صفحتان

اجب عن التالي كل سؤال 10 درجات - الاختبار يحقق ILOs التالية:

A4,a8, a12, a16,b2, b6,b9, b11,b12, b14,c3, c5,c12,c15,c16,d1,d4,d6

- 1- write an algorithm that search for n elements in a vector of m elements using linear search. What is the expected number of comparisons. Apply the algorithm for the next data (m=16), search for the numbers 48, 19,54 . (n=3)

6, 11, 12, 4, 15, 7, 19, 22, 77, 25, 29, 3, 41, 54, 5, 64

- 2- Write an algorithm that sorts n elements using merge sort algorithm. Apply for the next data (n=20), discuss algorithm complexity

2, 22, 41, 64, 14, 5, 29, 55, 17,71,25, 33, 11, 43, 50, 46, 82, 49, 23, 54

- 3- construct a binary tree for sorting next data, write the algorithm, discuss complexity of the algorithm.(n=20)

2, 22, 41, 64, 14, 5, 29, 55, 17,71,25, 33, 61, 43, 50, 46, 82, 39, 23, 54

- 4- Use stack to compute value of the next expression, write the postfix expression:

$(a*b)^c - (c-d)*E / (x^y)$.

construct the binary tree and generate the postfix expression.

- 5- Write an algorithm that sorts n elements, using radix sort technique. Apply for the next data,

12, 2, 41, 64, 14, 15, 29, 55, 17, 16, 25, 33, 61, 43, 50, 46, 80, 19, 23, 56

- 6- Use linked list to sort next items, deduce number of comparisons. Delete the item 55 from linked list, Find the new linked list. Write the instructions for deletion.

12, 2, 41, 64, 14, 15, 29, 55, 17, 16, 25, 33, 61, 43, 50, 46, 80, 69, 23, 56

- 7- construct the next tree, using the double linked list. Write the algorithm.

Traverse the tree using postfix notation. Delete element (h). insert item P to

be a right child for item k. let P has a left child x.

sequence	1	2	3	4	5	6	7	8	9	10	11	12
Right	2	4	6	0	0	8	10	0	0	0	0	0
information	a	b	c	d	e	f	g	h	i	j	k	L
left	3	5	7	0	0	9	11	0	0	12	0	0

8- Let a set of tasks to be processed in a FCFS_queue using one server, find the average completion time, average waiting time, consider front =1, rear= 13 . find number of waiters in queue (queue length) each time new task is processed. What if 2 independent processors are used for service. Write instructions for insertion and delete items.

Task num.	1	2	3	4	5	6	7	8	9	10	11	12	13
Expected execution time	25	22	12	20	2	50	30	10	2	20	40	10	5

9- given a text := abcdefghij, use the key: aligfedcba, to encrypt that text. Write an algorithm for encryption. Show how the received text (decrypted) can be verified.

مع الدعاء بالتوفيق ..