中原大學　106 學年度 ☑上學期　**考試解答**　☑期末

科目名稱：資料結構　　開課班級：資工二甲/資工二乙　　油印份數：63/52

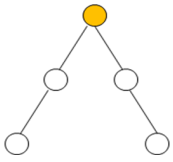
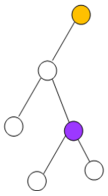
I. Single-Choice or Multiple-Choices Problems (50%) 每題 3 分，共 20 題，答錯一題倒扣 1 分，滿分以 50 分為上限，題目混雜單選或多選，請謹慎作答！

1	2	3	4	5	6	7	8	9	10
C	B	C	A	B	ABD	CD	ABC	BCD	BD
11	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
D	B	C	B	C	AB	CD	AC	BCD	BCD

II. Simple-Answering Problems (30%)每格 3 分，共 11 格，作答完整才得分，滿分以 30 分為上限

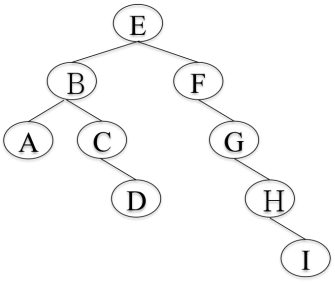
1.
(1) n^2
(2) n^2
(3) n logn
(4) n

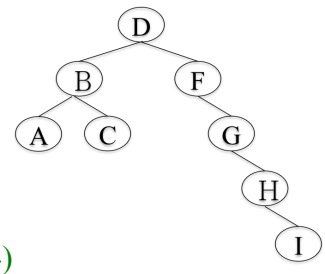
2.
(5) 0 + 7 + 11 + 13 + 18 + 26 + 33 + 20 = 128 / 8 = 16 (seconds)
(6) J3, J5, J6
(7) 0 + 7 + 10 + 7 + 10 + 10 + 8 + 0 = 52 / 8 = 6.5 (seconds)
(8) 0 + 0 + 5 + 0 + 6 + 4 + 11 + 0 = 26 / 8 = 3.25 (seconds)
(9) J7

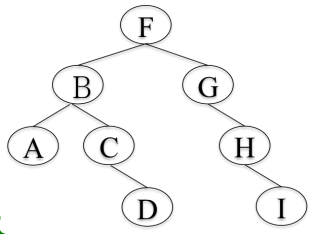
3.
(10)

(11)


III. Advanced Problems (20%)每一空格 3 分，共 7 空格，作答完整才得分，滿分以 20 分為上限

1.
(1) 9+8+7+…+1+1 = 46
(2) 1+2+3+…10 = 55

2.
(3)


(4)


OR


3.
(5) complete binary tree: no hole among the leaf nodes on the left of the bottom level
(6) sorted external paths: the nodes on the path from a leaf to the root is sorted
(7) (step 1) build a heap by n insertions, so it is totally O(n log n)
(step 2) move the max to the end by n deletion, so it is also O(n log n)
key points: insertion and deletion are O(log n)