

**2010 USABO Semifinal Exam
Answer Key Parts A & B**

Total no. of items: 137

Subjective Score:

Item	Answer	Weight	Penalty
1	C	1.00	0.00
2	E	1.00	0.00
3	C	1.00	0.00
4	E	1.00	0.00
5	C	1.00	0.00
6	A	1.00	0.00
7	A	1.00	0.00
8	C	1.00	0.00
9	E	1.00	0.00
10	C	1.00	0.00
11	D	1.00	0.00
12	C	1.00	0.00
13	A	1.00	0.00
14	C	1.00	0.00
15	A	1.00	0.00
16	D	1.00	0.00
17	D	1.00	0.00
18	D	1.00	0.00
19	A	1.00	0.00
20	B	1.00	0.00
21	E	1.00	0.00
22	C	1.00	0.00
23	E	1.00	0.00
24	B	1.00	0.00
25	A	1.00	0.00
26	B	1.00	0.00
27	C	1.00	0.00
28	C	1.00	0.00
29	E	1.00	0.00
30	C	1.00	0.00
31	E	1.00	0.00
32	B	1.00	0.00
33	E	1.00	0.00
34	B	1.00	0.00
35	B	1.00	0.00
36	D	1.00	0.00
37	B	1.00	0.00
38	D	1.00	0.00
39	D	1.00	0.00
40	C	1.00	0.00
41	B	1.00	0.00
42	D	1.00	0.00
43	D	1.00	0.00
44	B	1.00	0.00
45	D	1.00	0.00
46	D	1.00	0.00
47	A	1.00	0.00
48	B	1.00	0.00

Item	Answer	Weight	Penalty
49	A	1.00	0.00
50	B	1.00	0.00
51	B	1.00	0.00
52	B	1.00	0.00
53	D	1.00	0.00
54	C	1.00	0.00
55	C	1.00	0.00
56	A	1.00	0.00
57	E	1.00	0.00
58	D	1.00	0.00
59	B	1.00	0.00
60	A	1.00	0.00
61	B	1.00	0.00
62	B	2.00	0.00
63	C	1.00	0.00
64	C	2.00	0.00
65	C	2.00	0.00
66	C	1.00	0.00
67	B	1.00	0.00
68	A	1.00	0.00
69	D	1.00	0.00
70	E	1.00	0.00
71	A	1.00	0.00
72	A	1.00	0.00
73	A	1.00	0.00
74	B	3.00	0.00
75	D	3.00	0.00
76	E	5.00	0.00
77	C	4.00	0.00
78	A	1.00	0.00
79	A	1.00	0.00
80	A	1.00	0.00
81	A	1.00	0.00
82	B	1.00	0.00
83	D	2.00	0.00
84	A	2.00	0.00
85	C	2.00	0.00
86	A	1.00	0.00
87	A	1.00	0.00
88	B	1.00	0.00
89	B	2.00	0.00
90	B	1.00	0.00
91	A	1.00	0.00
92	B	1.00	0.00
93	A	1.00	0.00
94		0.00	0.00
95	B	1.00	0.00
96	B	1.00	0.00

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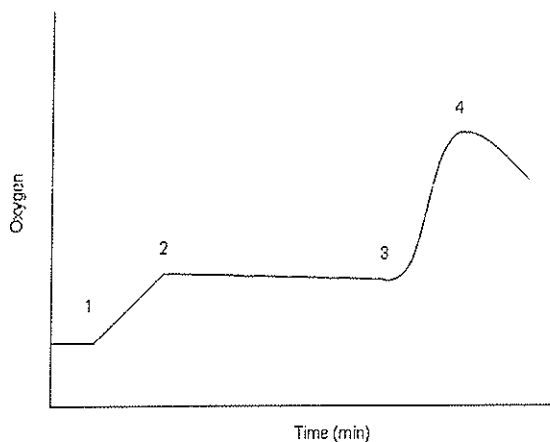
Item	Answer	Weight	Penalty
97	B	1.00	0.00
98	B	1.00	0.00
99	B	1.00	0.00
100	A	1.00	0.00
101	A	1.00	0.00
102	A	1.00	0.00
103	A	1.00	0.00
104	A	1.00	0.00
105	A	1.00	0.00
106	B	1.00	0.00
107	A	1.00	0.00
108	B	1.00	0.00
109	B	1.00	0.00
110	B	1.00	0.00
111	C	1.00	0.00
112	A	1.00	0.00
113	B	1.00	0.00
114	C	1.00	0.00
115	E	1.00	0.00
116	B	1.00	0.00
117	A	1.00	0.00
118	B	1.00	0.00
119	A	1.00	0.00
120	B	1.00	0.00
121	A	1.00	0.00
122	B	1.00	0.00
123	D	1.00	0.00
124	C+E	1.00	0.00
125	B	1.00	0.00
126	A	1.00	0.00
127	A	1.00	0.00
128	A	1.00	0.00
129	B	1.00	0.00
130	B	1.00	0.00
131	A	1.00	0.00
132	A	1.00	0.00
133	A	1.00	0.00
134	B	1.00	0.00
135	B	1.00	0.00
136	B	1.00	0.00
137	A	1.00	0.00

PART C

138. Compare and contrast a dicot root with the stem of that same plant placing the LETTER(S) of the correct contrasting member of a pair in the blanks provided in the following table. Terms may be used more than once or not at all. A. endarch origin ; B. exarch origin C. endogenous ; D. exogenous E. generally present ; F. generally absent G. in bundles ; H. not in bundles (5 points)

Character	Root	Stem
Pith	F	E
Primary xylem	B, H	A, G
Pericycle	E	F
Vascular tissue	H	G
Lateral appendages	C	D

Questions 139 to 140. You and your partner are in lab. You use the oxygen probe to graph oxygen production in a photosynthesis experiment (see graph below). You are distracted and forget to record the order in which you change the chlorophyll solution conditions. (4 points)



139. Which area on the graph (1, 2, 3, or 4) most likely corresponds to the point at which DCMU was added? Why? (2 points)

DCMU inhibits Photosystem II by inactivating the plastoquinone-binding protein in the electron transport chain. This ultimately results in permanent reduction of the chlorophyll, cannot accept electrons from water, water is not split, and O_2 is not released.

140. Which area on the graph (1, 2, 3, or 4) most likely corresponds to the point at which NH_4Cl was added? Why? (2 points)

NH_4Cl uncouples the electron transport chain from the electrochemical gradient, removing all negative feedback. This increases the speed at which O_2 is released.