

CSIR NET Life science answer key June 2016

For Booklet B (Answers will be same for the questions but the question number will vary)

Question No	Answer Key	Question Number	Answer Key
1	3	76	1
2	2	77	4
3	1	78	1
4	2	79	2
5		80	2
6	2	81	3
7	2	82	4
8	4	83	2
9	4	84	2
10	3	85	3
11	4	86	1
12	3	87	3
13	3	88	1,3
14	1	89	1
15	1	90	3
16	2	91	2
17	3	92	3
18	4	93	2,4
19	3	94	3
20	2	95	1
PART B		96	4
21	4	97	1
22	3	98	2
23	4	99	1
24	2	100	2
25	1	101	
26	1	102	2
27	4	103	4
28	4	104	3
29	3	105	1
30	3	106	4
31	4	107	4
32	2	108	4
33	1	109	3
34	4	110	
35	4	111	2
36	3	112	4
37	2	113	4

38	3		114	4
39	1		115	4
40	3		116	3
41	2		117	1
42	3		118	1
43	2		119	2
44	2		120	2
45	2		121	3
46	4		122	3
47	4		123	2
48	2		124	4
49	2		125	4
50	4		126	3
51	1		127	4
52	1		128	1
53	2		129	1
54	1		130	1
55	2		131	1,3
56	1		132	1
57	4		133	3
58	3		134	
59	1		135	1
60	1		136	2
61	1		137	2
62	3		138	4
63	3		139	3
64	1		140	
65	4		141	1
66	3		142	
67	3		143	1
68	2		144	2
69	3		145	3
70	1			
	PART C			
71	4			
72	1			
73	2			
74				
75	4			

19. The volume of a triangular prism can be found by the formula:

volume = $1/2 * \text{length} * \text{width} * \text{height}$.

23.

Gas	Solubility*
Acetylene	0.117
Ammonia	52.9
Bromine	14.9
Carbon dioxide	0.169
Carbon monoxide	0.0028
Chlorine	0.729
Ethane	0.0062
Ethylene	0.0149
Hydrogen	0.00016
Hydrogen sulfide	0.385
Methane	0.0023
Nitrogen	0.0019
Oxygen	0.0043
Sulfur dioxide	11.28

*Grams of gas dissolved in 100 g of water when the total pressure above the solution is 1 atm.

55.

Table 1. The 25 hotspots.

Table 1 The 25 hotspots							
Hotspot	Original extent of primary vegetation (km ²)	Remaining primary vegetation (km ²) (% of original extent)	Area protected (km ²) (% of hotspot)	Plant species	Endemic plants (% of global plants, 300,000)	Vertebrate species	Endemic vertebrates (% of global vertebrates, 27,298)
Tropical Andes	1,298,000	314,200 (25.0)	79,687 (25.3)	45,000	20,000 (6.7%)	3,389	1,567 (5.7%)
Mesoamerica	1,155,000	231,000 (20.0)	138,437 (99.9)	24,000	5,000 (1.7%)	2,859	1,159 (4.2%)
Caribbean	263,500	29,840 (11.3)	29,840 (100.0)	12,000	7,000 (2.3%)	1,518	779 (2.9%)
Brazil's Atlantic Forest	1,227,600	91,930 (7.5)	33,084 (35.9)	20,000	8,000 (2.7%)	1,361	567 (2.1%)
Chocó/Darien/Western Ecuador	260,800	63,000 (24.2)	16,471 (26.1)	9,000	2,250 (0.8%)	1,025	418 (1.5%)
Brazil's Cerrado	1,783,200	366,630 (20.0)	22,000 (6.2)	10,000	4,400 (1.5%)	1,256	117 (0.4%)
Central Chile	300,000	90,000 (30.0)	9,167 (10.2)	3,429	1,605 (0.5%)	335	61 (0.2%)
California Floristic Province	324,000	80,000 (24.7)	31,443 (39.3)	4,426	2,125 (0.7%)	584	71 (0.3%)
Madagascar*	694,150	69,038 (9.9)	11,648 (19.6)	12,000	9,704 (3.2%)	967	771 (2.8%)
Eastern Arc and Coastal Forests of Tanzania/Kenya	30,000	2,000 (6.7)	2,000 (100.0)	4,000	1,500 (0.5%)	1,019	121 (0.4%)
Western African Forests	1,265,000	126,500 (10.0)	20,324 (16.1)	9,000	2,250 (0.8%)	1,200	270 (1.0%)
Cape Floristic Province	74,000	18,000 (24.3)	14,060 (78.1)	8,200	5,682 (1.9%)	652	53 (0.2%)
Succulent Karoo	112,000	30,000 (26.8)	2,352 (7.8)	4,849	1,940 (0.6%)	472	45 (0.2%)
Mediterranean Basin	2,362,000	110,000 (4.7)	42,123 (38.3)	25,000	13,000 (4.3%)	770	235 (0.9%)
Caucasus	600,000	60,000 (10.0)	14,050 (23.1)	6,300	1,600 (0.5%)	632	59 (0.2%)
Sundaland	1,600,000	125,000 (7.8)	90,000 (72.0)	25,000	15,000 (5.0%)	1,800	701 (2.6%)
Wallacea	347,000	52,020 (15.0)	20,415 (39.2)	10,000	1,500 (0.5%)	1,142	509 (1.9%)
Philippines	300,000	9,023 (3.0)	3,910 (43.3)	7,620	5,632 (1.9%)	1,066	518 (1.9%)
Indo-Burma	2,090,000	100,000 (4.9)	100,000 (100.0)	13,500	7,000 (2.3%)	2,155	528 (1.9%)
South-Central China	800,000	64,000 (8.0)	16,582 (25.9)	12,000	3,500 (1.2%)	1,141	178 (0.7%)
Western Ghats/Sri Lanka	162,200	12,450 (6.8)	12,450 (100.0)	4,780	2,180 (0.7%)	1,073	355 (1.3%)
SW Australia	309,850	33,336 (10.8)	33,336 (100.0)	5,469	4,331 (1.4%)	456	100 (0.4%)
New Caledonia	18,600	5,200 (28.0)	526.7 (10.1)	3,332	2,651 (0.9%)	190	84 (0.3%)
New Zealand	270,500	59,400 (22.0)	52,068 (87.7)	2,300	1,865 (0.6%)	217	136 (0.5%)
Polynesia/Micronesia	48,000	10,024 (21.8)	4,913 (49.0)	6,557	3,334 (1.1%)	342	223 (0.8%)
Totals	17,444,300	2,122,891 (12.2)	800,767 (37.7)	†	133,149 (44%)	†	9,645 (35%)

Documentation of plant and vertebrate species and endemism can be found in Supplementary Information.
 *Madagascar includes the nearby islands of Mauritius, Reunion, Seychelles and Comoros.
 † These totals cannot be summed owing to overlapping between hotspots.

Source : http://www.nature.com/nature/journal/v403/n6772/fig_tab/403853a0_T1.html

63.

The method combines a standard and efficient technique of **mutagenesis** using a chemical mutagen such as **Ethyl methanesulfonate (EMS)** with a sensitive DNA screening-technique that identifies single base mutations (also called point mutations) in a target gene. The TILLING method relies on the formation of **DNA heteroduplexes** that are formed when multiple alleles are amplified by **PCR** and are then heated and slowly cooled. A “bubble” forms at the mismatch of the two DNA strands, which is then cleaved by a single stranded **nucleases**. The products are then separated by size on several different platforms (see below).

68

$$N = N_0 e^{rt}$$

$$N = 2N_0; \text{ so}$$

$$2N_0 = N_0 e^{rt}$$

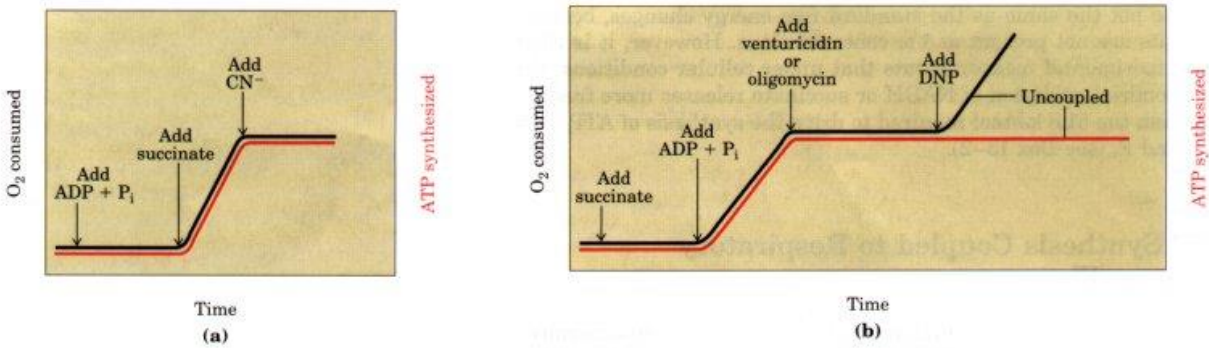
$$\frac{2N_0}{N_0} = e^{rt}$$

$$2 = e^{rt}$$

$$\ln 2 = rt$$

$$\frac{\ln 2}{r} = t; \text{ t} = \text{doubling time}$$

75. 4



76.

$$V_{max} = 3 \text{ } \mu\text{mol/min}$$

$$V_{max} = K_{cat} \times E_t$$

$$\text{and } k_{cat} = V_{max} / E_t = \text{turnover number} =$$

77.

78.

Labeling of Band 3

For Band 3 labeling, 2 μl of a 2% hematocrit in PBS suspension was mixed in 46 μl PBS plus 2 μl of 1 μM EMA in PBS. After 20 min at room temperature, the sample was centrifuged, the supernatant removed, and the cells were resuspended in 50 μl PBS. To demonstrate specificity, Band 3 labeling of red cells was blocked by first incubating cells in 25 μM DIDS for 45 min at 37°C (Salhany et al., 2003), and then EMA was added as above. Residual labeling by EMA proved undetectable in conventional fluorescence microscopy, and in total internal reflection (TIRF) microscopy it appeared very dim and bleached in 1 s.

Source: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1304820/>

111.

