2016 ASOE Answers

Part A:

Question	Answer	Question	Answer
1	D	26	D
2	D	27	D
3	C	28	A
4	C	29	D
5	A	30	D
6	C	31	D
7	C	32	B
8	C	33	D
9	C	34	D
10	C	35	B
11	B	36	A
12	D	37	B
13	D	38	A
14	A	39	D
15	C	40	B
16	C	41	A
17	C	42	B
18	D	43	B
19	C	44	D
20	A	45	B
21	A	46	C
22	D	47	C
23	D	48	D
24	D	49	A
25	B	50	C

Part B:

Question 1

a) (5 marks- shape, title, axis scale + titles x2, using the whole space)
b) 2.20 or 140 minutes (Note error in the table in this question as it should read hours and minutes)
c) (1 mark → the mutation does not confer an inherent advantage otherwise individuals positive for the mutation would be over-represented in the lower times)

Question 2

a) High near aorta and vena cava, low at capillaries = 2 marks. Otherwise 0
b) Line A should be lower, line B should not change
c) Accumulation of fluid, swelling etc.
d) Brings nutrients, oxygen, increased blood flow to the site, signals to the person that there is damage here, immune cells enter tissue to fight potential infection/invasion… use discretion to award fair marks, it is an open question

Question 3

A) 389 x 2 x 100 x 100 x 10 = 7.8×10^7 CFU/gram

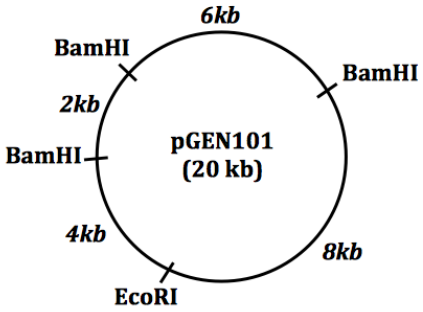
4 marks for correct answer with evidence of working out/understanding
2 marks for correct answer without method
1 mark for no answer or incorrect answer, but working that is somewhat correct or on the right track (demonstrates understanding)
Otherwise award 0 marks

B) No

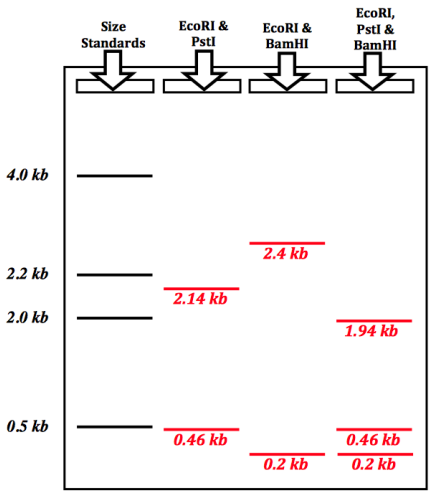
c) The number of colonies on the agar plate becomes easier to count (or) impractical to count colonies if not diluted

Question 4

a)



b)



Question 5

a) 60 x 120; = 7200 cm^3 or 7.2 dm^3; (units essential)

b) 125 x 60 x 24; = 180000 cm^3 or 180 dm^3; (units essential)

c) 180/7.2 = 25

Question 6

a) Membrane bound organelles, simplicity, genome, presence of histones, replication by binary fission or mitosis, linear/circular chromosome, size, etc.

b) (double helix) of DNA unravels to form two single stranded (primer) DNA molecules; these attract complementary (energy rich) nucleotides/nucleoside triphosphates (to primer strands); these join to (primer) strands forming daughter DNA; under influence of DNA polymerase; bases join by hydrogen bonds between complementary pairs; and adjacent sugars join by phosphate bridges;

c) 2 (arbitrary) units;

d) chromatids separate to poles; during anaphase; nuclear membranes then reform around two daughter nuclei; each containing the diploid number of chromosomes;

e) 1 (arbitrary) unit;

Question 7

(a) (i) $\frac{84}{100} \times \frac{15}{100} \times 100 =$ and $\frac{16}{100} \times \frac{15}{100} \times 100 =$;

12.6 ; 2.4 ;

(ii) $\chi^2 = \frac{(78-71.4)^2}{71.4} + \frac{(6-12.6)^2}{12.6} + \frac{(7-13.6)^2}{13.6} + \frac{(9-2.4)^2}{2.4}$;

(accept later stages of working if correct)

= 25.42 ;

(iii) n = 1;

(iv) reject the null hypothesis;
because calculated value is greater than the critical value;
(allow consequential error if value from (ii) is incorrect)