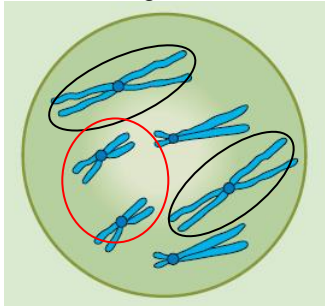
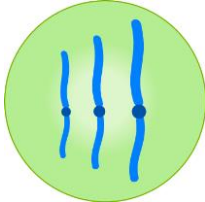




Question number	Answer	Marks	Guidance
1	D;	1	
2 (a)	<i>idea of specialised structures develop; carry out specific functions;</i>	2	
2 (b)	have cilia; cilia can move; fluids can be moved past the cell; e.g. mucus;	3	
2 (c)	cells are individual; epithelium is a tissue; group of cells; working together ;	4	
2 (d)	cilia (on ciliated cells); waft / described, fertilised egg;	2	
2 (e)	D, B, A, E, C;	1	
3 (a)	Q, T, P, R ; ; ; ;	4	Allocate marks for the following pairs: S – Q Q – T T – P P - R
3 (b) (i)	growth of cell / growth of organelles / increase number of organelles / synthesis of proteins ;	1	DO NOT ACCEPT 'growth' unqualified DO NOT ACCEPT refs to DNA replication IGNORE ref. to respiration ACCEPT named steps in protein synthesis
3 (b) (ii)	mutation / faulty DNA produced / error in copying ; daughter cells will not receive identical genetic information ; proteins / (daughter) cells, not made / do not function ;	2	ACCEPT 'daughter cells will not be clones' ACCEPT 'proteins / daughter cells function differently'
3 (c)	haploid / half genetic information / chromosome number is n ; genetic information not identical / produces genetically different cells ; 4 cells produced ;	2 max	ACCEPT use of comparative chromosome numbers as example DO NOT ACCEPT identical / not identical without 'genetic' DO NOT ACCEPT smaller cells
4 (a)	(three days = 72 hrs) 72 hours – 36 hours = 36 hours; (36 hours divided 8) = 4 $2^4 = 32$;	2	
4 (b) (i)	two sets of chromosomes; one set from each parent;	2	
4 (b) (ii)	gamete;	1	
4 (c)	Do not pair up ; n ; 2n ; 2 ; 2 ; 1 ; ✓ ;	4	1 mark per correct row
4 (d) (i)	two homologous chromosomes circled ;	1	ACCEPT one circle around both chromosomes or two circles The two chromosomes must be of same length 

4 (d) (ii)	three chromosomes, one from each pair ; chromosomes drawn as one bar ;	2	Chromosomes should be of different lengths however if two are of similar length, look for different centromere position to award mark  ACCEPT  DO NOT CREDIT two joined together at centromere 
4 (e)	bacteria are prokaryotes / do not have a nucleus; single chromosome; need homologous chromosome(s) for meiosis;	3	
5 (a)	$15/16 \times 100$; 93.8%;	2	
5 (b)	cell divides at the right time; cell does not divide too often; cell is the right size ; DNA has been checked; chromosomes are in the right position;	3	
6 (a)	Immature cell; undifferentiated cell; capable of division;	2	
6 (b)	embryo; umbilical cord; adult; meristematic tissue;	3	Max 3
6 (c)	ability to differentiate into different cell types ; totipotent; can differentiate into any type of cell; pluripotent; can form all tissue types (but not whole organisms); multipotent; can only form a range of cells within a certain type of tissue;	5	Max 5
6 (d)	Heart disease; repair of muscle tissue in the heart is damaged as result of a heart attack; Diabetes; replace (beta) cells destroyed by the immune system; Parkinson's disease; replace dopamine producing cells in the brain; Alzheimer's disease; replace brain cells are killed by abnormal proteins; genetic disease; reverse previously untreatable birth defects;	6	2 marks per example