Answers for extension worksheet – Option F

1 **a** The rate of increase slows after approximately 3.5 days, and the increase stops altogether at about 6 days. (1)

b The levels of sugar and nitrogen have fallen and the yeast numbers have risen so there is insufficient food to sustain further increase in the yeast population. (1)

c glucose (1)

d malted barley (1)

e After three days, the level of ethanol has reached 80%. The additional level of production to reach 100% would require a further three days, which would be expensive in time and energy costs. (3)

f Traditional production methods allow the fermentation to continue until all the resources are used up and the ethanol content has reached its maximum. Continuous fermentation only allows for 80% of the resources to be converted to ethanol. (1)

g any one from:
continuous fermentation enables the process to continue once alcohol has been removed so there is no interruption in production;
it is suitable for types of beer such as lagers;
production is faster (1)

2 **a** any three from:
the bacterium lives inside the cells of its host and is undetected by the immune system; it does not produce toxins; it does not damage cells; so it does not produce obvious symptoms (3)

b **i** An antibiotic is an antimicrobial agent that kills or inhibits bacteria. (1)

ii by inhibiting the production of cell walls; by inhibiting or preventing protein synthesis; by affecting the production of DNA or RNA (3)

iii Viruses use the host's cell metabolism to reproduce and do not have protein or DNA synthesizing mechanisms of their own. Antibiotics do not affect eukaryotic metabolism. (2)

3 **a** a protozoan (1)

b It is transmitted in the saliva of the biting mosquito. (1)

c The vector organism is the female *Anopheles* mosquito, which can only reproduce in hot climates and requires stagnant water for its larval stage. (1)

d three from:
use of mosquito nets to prevent bites;
programmes to destroy insects with insecticides or sterilization;
removal of breeding areas such as stagnant pools or treating still water with detergent or oil to prevent insect larvae breathing;
other suitable suggestion (3)

e **i** The person's temperature changes as the parasites complete the stages of their life cycle. (1)

ii As infected blood cells burst (after they become filled with parasites) merozoites and debris are released into the bloodstream, causing fever. (1)

f If different parts of the world become warmer, the range of the *Anopheles* mosquitoes will increase and will carry malaria to new geographical locations. (1)

