Module 5 Questions
1. What is the significance of ATP in bacterial metabolism?

2. Explain the process of biological redox reactions and give an example.

3. Glucose is reduced to CO$_2$ and H$_2$O. True or false and explain.

4. Explain what is meant be dehydrogenation.

5. How is ATP formed?

6. Briefly outline the three cellular mechanisms for generating ATP from ADP and inorganic phosphate.

7. What is substrate-level phosphorylation?

8. Photophosphorylation involves a similar mechanism to substrate-level phosphorylation. True or false and explain.

9. Name the two general processes that are used to catabolise glucose. Which produces more energy?

10. Name the three general stages of cellular respiration and how much ATP is generated at each stage.

11. Outline the process of glycolysis using the Embden-Meyerhof pathway.

12. One of the reactions in the glycolytic pathway requires energy. Where does this energy come from and how can this pathway be considered as an energy producing one?

13. By what mechanism is ATP generated in glycolysis?

14. What three components make up the process of aerobic respiration?

15. Outline the TCA cycle noting the steps that are important for energy production.

16. The complete breakdown of glucose into CO$_2$ and H$_2$O occurs in the TCA cycle. True or false and explain.
17. What are the two types of general reactions that occur in the TCA cycle? What is the significance of each?

18. What are the three types of molecules involved with the electron transport chain and give an example of each.

19. Outline the function of the electron transport chain in the chemiosmotic generation of ATP.

20. Write the overall reaction for the catabolism of glucose.

21. What are proton pumps?

22. What is the proton motive force and how is it generated?

23. What advantage does the pentose-phosphate pathway offer? Is it independent of glycolysis?

24. Define fermentation.

25. Distinguish between homolactic and heterolactic fermentation.

26. Why does fermentation yield less energy than glycolysis?

27. Why is the oxidation of NADH and NADPH so important in fermentation?

28. What is the overall equation for the formation of glucose via photosynthesis? What two reactions are required for this process?

29. Distinguish between oxygenic and anoxygenic photosynthesis.

30. Describe the dark reaction.

31. What are the two criteria on which organisms can be nutritionally classified?

32. Define the following terms and give examples of organisms with each type of metabolism
(a) Photoautotroph
(b) Chemoheterotroph
(c) Chemoautotroph
(d) Photoheterotroph