1. Sustainable development has 3 main components. These are:

- [x] Social, economic and environmental
- [ ] Environmental, economic and climate
- [ ] Life-cycle, economic and social
- [ ] Past, present and future

2. Life cycle assessment is a technique that allows us to:

- [x] Evaluate the environmental impact of a product or activity from its production, through its life cycle and use
- [ ] Quantify the anticipated lifetime of a product or service
- [ ] Understand the rate of material recycling
- [ ] Work out the break-even cost of a product

3. Which of the following statements describes the present situation with regards to advanced biofuels best in your opinion?

- ○ Advanced biofuels can never truly replace fossil fuels, as they are (subtly) different in terms of chemistry.
- ○ Advanced biofuel producing systems/organisms have already been obtained to fully replace fossil fuels in future
- ◉ Advanced biofuels that fully replace fossil fuels might be possible in future, but the present biochemical knowledge/biotechnological tool box is insufficient to be confident of this.
- ○ Advanced biofuels that fully replace fossil fuels might be possible in future, clear strategies and a molecular toolkit are in place to achieve this.

4. Which of the following statements describes biological alkene/alkane production best in your opinion?

- ○ Alkenes or alkanes are not biologically produced, and their production requires development of completely novel enzymes.
- ○ Alkenes or alkanes are readily produced by various organisms, in sufficient levels to envisage economical production without need for further improvement
- ◉ Alkenes or alkanes are produced by organisms, but in minor quantities, making economical production dependent on future improvements using biotechnology.
- ○ Alkenes or alkanes are only produced by organisms containing aldehyde decarbonylase, and future economically relevant production is dependent on improving that particular catalyst.

5. What are the main products of the ABE fermentation process?

- [x] Acetone, butanol and ethanol
- [ ] Propanone, butanone and ethanoic acid
- [ ] Acetic acid, butyl alcohol and ethyl alcohol
- [ ] Acetone, butane and ethane

6. What is the name given to a membrane process in which the feed is a liquid mixture and the permeate is removed as a vapour?

- [ ] Pertraction
- [ ] Vapour permeation
- [x] Pervaporation
- [ ] Nanofiltration

7. Which of the following power sources is the best candidate for replacement by an enzymatic fuel cell, based on current technology? Is it:

- [ ] Electric car battery
- [ ] Laptop battery
- [x] Mobile phone battery

8. Which of the following components are still required in a HYBRID enzymatic fuel cell that uses multicopper oxidases? Is it:

- (●) Polymer electrolyte membrane
- ( )
- Cathode catalyst
- ( )
- Strong acid

9. What are the advantages of using peptides for the design of hydrogels for biomedical applications?

- (●) Fully chemically defined and biocompatible
- ( ) Polydispersed and non-biodegradable
- ( ) Animal derived

10. What is the key property that makes peptide hydrogel injectable?

- ( ) Can be chemically crosslinked
- (●) Shear thinning
- ( ) Gels in the presence of body fluid

11. Scaffolds are important physical substrates for cell attachment, proliferation and differentiation. They can be described as:

- ○ 3D
  biocompatible and permanent porous structures
- ○ 3D
  biocompatible and biodegradable solid structures
- ◉ 3D biocompatible and
  biodegradable porous structures
- ○ 2D
  biocompatible and biodegradable porous structures

12. Additive
manufacturing is a key technology for tissue engineering. It can be defined as:

- ○ Emerging
  technology that creates objects fusing materials layer-by-layer
- ○ Emerging
  technology that creates objects sintering materials layer-by-layer
- ○ Emerging
  technology that creates objects extruding materials layer-by-layer
- ◉ Emerging technology
  that creates objects adding materials layer-by-layer