



EXAMINATIONS 2011 / 2012

ARHOLIADAU 2011 / 2012

Semester 2

FACULTY OF: Applied Design & Engineering

NAME OF COURSE/PROGRAMME:

**BEng Motorsport Engineering & Design
BEng Automotive Engineering
BEng Motorcycle Engineering**

YEAR OR LEVEL:

Level 5

MODULE NUMBER

M2X8810

NAME OF MODULE/UNIT/EXAM PAPER:

Engineering Management

DATE OF EXAMINATION:

Tuesday 22nd May 2012

EXAMINATION TIMES:

START TIME:

12.00 pm

FINISH TIME:

2.00 pm

TIME ALLOWED:

2 hours

INSTRUCTIONS TO CANDIDATES:

Answer 3 questions out of 4.

Question 1



Dragon Electric Vehicles have recently launched an electric powered off road buggy. The buggy is road legal and registered for zero emissions £0 taxation class. The buggy charges from a standard domestic 240v AC supply at 1Kw. Currently the buggy uses simple lead acid batteries and has a range of approximately 30 miles.

The buggy currently retails at £10,000 each.

It would be possible to use Lithium battery technology offering a larger range but at greater cost of approximately £13,000 each.

A number of buggies have been sold to a holiday village and a consortium of country cottages. The holiday makers can rent the vehicle and use it to explore the surrounding countryside and attractions, using local roads and green ('off-road') lanes.

Dragon Electric Vehicles are also receiving requests for information from local residents and other tourist centres

. Whilst sales are currently expanding, the management at Dragon Electric Vehicles wish to analyse their current and potential future market position; with a view to increasing investment and expanding their current premises.

- a) Describe the Porters Five Forces – Analysis of competitive position. (4 marks)
- b) Apply the model to Dragon Electric Vehicles electric buggy. (8 marks)
- c) Select **four** issues effecting the competitive position and suggest and describe possible changes that could improve the competitive position of the Dragon Electric Vehicles electric buggy. (8 marks)

Question 2

You are joining a recently started upmarket clothing company. They specialise in expensive outdoor performance jackets, trousers and accessories. They have advertised in outdoor magazines and attend trade shows. They believe that they have established a reasonable market share in this area. They have employed a new designer that has developed a more urban chic designer range that should appeal to the younger affluent buyer. (under 40 years old).

They are considering sponsoring some sporting events.

- a) Evaluate three types of sponsorship and what an organisation could hope to achieve by investing in sponsorship. **(5 marks)**
- b) Perform an analysis of possible areas of sponsorship that would be attractive to the organisation and explain the potential advantages that could be gained. **(5 marks)**
- c) Develop a strategy as part of the wider marketing mix. It would be appropriate to apply the SOSTAC model. **(10 marks)**

Question 3

An internationally renowned race car team have decided to produce a high performance road car. Orange donkey racing have teamed up with a variety of engineering consultants to research, design and develop the vehicle. The organisation wish to promote the technology transfer from the racetrack to road vehicles. Orange Donkey Racing wish to ensure that any intellectual property developed is effectively protected.

- 1. What tactics should Orange Donkey undertake to ensure that their ownership of intellectual property is not compromised. **(5 marks)**
- 2. Develop a strategy to protect the following vehicle aspects, explain your reasoning, the process involved and any potential concerns.
 - a) The revised vehicle logo **(5 marks)**
 - b) The exterior body shape and wheel design **(5 marks)**
 - c) The novel adoption of a specialised transmission for linking the rear axle to a kinetic energy recovery storage system **(5 marks)**

Question 4

The Race Damper Company, currently manufacture medium cost dampers for low volume sports car manufactures and race teams. The organisation is deciding whether or not to start a new business branch offering a mobile and circuit / factory damper tuning service. The company is preparing a business plan that he will eventually present to a national bank in order to apply for a business loan. The company has identified some capital expenditure that he will need to make to establish the business. The company is envisaging that the equipment will be used for three years after which he will be able to sell it for 25% of the original purchase price.

2x Bespoke trucks	£88,000
Portable petrol compressors	£ 8,000
Portable electrical generators	£ 4,000
Damper dynamometer	£ 14,000
Trolley jacks, racking etc	£ 2,000
Vehicle fitment, awning etc	£ 4,000
Total	£120,000

Calculate the depreciation using:

- a) Straight line method **(2 marks)**
- b) Reducing balance method **(8 marks)**
- c) Comment on your findings **(3 marks)**
- d) Critique the advantages and disadvantages of using the straight line and reducing balance methods. Which method of calculating the depreciation is likely to be most appropriate for use in the Race Tyre Company's business case preparation, and why. **(7 marks)**