Examination Period 3: 2016/17

ENGM00817N

Module Title Condition Monitoring
Level Seven
Time Allowed Two hours

Instructions to students:

- Enter your student number not your name on all answer books.
- Answer four questions: two from Section A and two from Section B.
- The use of a non-programmable calculator is permitted.
- Students are permitted to remove this examination paper at the end of the examination.

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Section A

Answer two out of three questions.

1. Critically assess how tribology could help to make an accurate prognosis of machine condition. (25 marks)

2. Evaluate why vibration analysis is used in CM highlighting the benefit of following a vibration program. (25 marks)

3. Discuss the IR regions most commonly used in IRT. Critically evaluate the differences between active and passive thermography. Explain different methods in thermography depending on how the heat is introduced into the structures. (25 marks)

Section B

Answer two out of three questions.

4. Safety dependent stressed components made of Mg-Al Alloy are subject a potentially corrosive environment. Critically assess examples from the literature of the type of failure and environments that could be a concern for this type of alloy. You can also relate and compare these corrosion mechanisms to those of other metal alloy systems as part of your discussion. (25 marks)

5. With reference to current technology how you would screen a selection of coating systems using two established laboratory techniques. At least one of the techniques should be an electrochemical procedure. Discuss hypothetical results from screening tests with typical data values you might expect. How would you present your results and explain any inconsistencies in the data between the different techniques? (25 marks)

6. You are faced with evaluating a steel reinforced concrete system in the lab. Evaluate critically the concepts of this system that protect the metal reinforcement. How would the system be assessed and analysed using an accepted electrochemical technique. What type of data would be generated? Give typical examples and demonstrate how the data would be processed or analysed to give meaningful information. (25 marks)

End of Paper