

QUESTION 1 (10 marks)

You are the Manager of Electrical Engineering at an underground coal mine that intends to purchase equipment for an additional development panel. The equipment will be mining a seam known to contain methane and carbon dioxide which will be pre-drained prior to mining.

The panel is to comprise a remote controlled continuous boiler miner, 2 electric shuttle cars, auxiliary fan and ratio feeder. The equipment is to be powered from a substation located outside the hazardous zone and a distribution and control box (DCB) located within the hazardous zone.

- a) Draw a single line diagram from the substation to the DCB, then from the DCB to all machines within the section nominating: (5 marks)
 - i) Cable sizes
 - ii) Approximate max lengths of cable
 - iii) Size of substation in KVA
 - iv) Approximate maximum demand for each item of plant

- b) Draw a single line diagram for the distribution and control box and nominate on the single line diagram the types of protection that you would specify and expected fault levels at the: (4 marks)
 - i) Secondary side of the substation
 - ii) DCB
 - iii) Boiler miner

Engineering Science N1 Question Papers And Memos

Minjie Lin



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