

**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 Paper Memos

**L Reisser**



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jun 29 2021 on january 31 1961 nasa launched ham the chimp into suborbital flight in an mr 2 rocket making him the first chimpanzee in space while the soviets had sent dogs into space before those missions merely tried to see if they could survive the trip

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the success of ham s flight helped ratchet up even further the already frantic contest for scientific and space supremacy between the u s and the soviet union and briefly made ham something of a star here life com commemorates ham s 16 minute

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