PROGRAM   : NATIONAL DIPLOMA
- MINING ENGINEERING.

MODULE   : S 4 MINE ENGINEERING III.

CODE   : MEG 3211.

DATE   : SUMMER SSA EXAMINATION 2015
10 DECEMBER 2015

DURATION   : (SESSION 1) 08:00 - 11:00

WEIGHT   : 60 % OF FINAL ALLOCATION.

TOTAL MARKS   : 100.

EXAMINER.   : I WERMUTH.

MODERATOR   : R ENGLISH

NUMBER OF PAGES   : Including this front cover: 3 Pages.

INSTRUCTIONS   - PLEASE ANSWER ALL THE QUESTIONS IN ORDER.

REQUIREMENTS   : CALCULATOR.

S 4 MINE ENGINEERING III

MEG 3211.

Please propose a response to each enquiry.

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<u>Q 1.</u>   Power output of driving motor .   (41) .

Scenario .

UnderGround Endless Rope Haulage Transport .

Distance	900 m .
Gradient	1 in 8 .
Speed	3.7 km / h .
Delivery	94 TPH Rock .
Tractive Resistance	193 N / Ton .
Mass Truck	400 kg .
Truck Load	800 kg .
Rope	
Factor of Safety	6
Ultimate Stress	1 400 MPa .
Construction	Spiral .

<u>Q 2.</u>   Diameter Ram in each Jack .   (20) .

<u>Scenario.</u>

Multi – Deck sinking stage suspended in vertical shaft, on 6 falls of rope,
attached to double drum winder.
3 falls of rope per drum.
One of doubling down sheaves in headgear has its pedestals supported on pair of hydraulic jacks.

Depth wind from centre line of sheave	1 300 m.
Mass rope	4.52 kg / m.
Breaking force rope	735 KN.
Mass sheave assembly	1 000 kg.
Pressure gauge reading on each jack	18 MPa.
Mass Stage	33.8 Tons

Q 3.   Length of each head and tail rope .   (17).

Scenario.

4 Rope Koepe friction hoist mounted in a tower above shaft.

Mass head and tail ropes	8.35 kg / m.
Mass rock	13 tons.
Mass each (skip + attachments).	23 tons.
Angle of wrap of ropes on drum	180 °.
Coefficient of friction between drum and rope	0.3.
Rock hoisted at	800 m / min.
Least possible distance in which skips brought to rest	33.9 m

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Q 4.   Supply Voltage .   (17).

Scenario.

Vertical shaft.
Number of Cables   6 .
5 Stations.
Electrical load on each station   300 KVA.
Pump chamber at bottom station.
7 Pumps.
Each pump driven by 1.6 MW motor.

Q 5.   Mass Cage .   (8).

Scenario.

Cage.
Loaded with 50 miners.
Travels up incline shaft.

Inclination	19 °.
Speed	450 m / min.
Maximum retardation permitted to avoid cage over running rope	4.5 m / s ^{2}

Emergency trip out on winder is evented.

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[100].