PROGRAM	:	BACHELOR OF ENGINEERING TECHNOLOGY *MINING ENGINEERING* BACHELOR OF MINE SURVEYING
SUBJECT	:	**ENGINEERING MANAGEMENT (MINE) 2B**
CODE	:	**MGTMNB2**
DATE	:	FINAL SUMMATIVE ASSESSMENT 16 NOVEMBER 2019
DURATION	:	3 HOURS
WEIGHT	:	60% OF FPM
TOTAL MARKS	:	100

EXAMINER	:	MR H STRAUSS
MODERATOR	:	MR P MALATJI
NUMBER OF PAGES	:	4 PAGES

INSTRUCTIONS	:	QUESTION PAPERS MUST BE HANDED IN
REQUIREMENTS	:	1 SCRIPT, SECOND ON REQUEST

INSTRUCTIONS TO CANDIDATES:

WRITE YOUR STUDENT NUMBER ON THE FRONT PAGE OF YOUR QUESTION PAPER BEFORE YOU ANSWER ANY QUESTIONS.

ANSWER ALL THE QUESTIONS.

HAND IN YOUR QUESTION PAPER WITH YOUR SCRIPT.

QUESTION 1

1.1 Write brief notes on the planning process. (6)

1.2 Describe the matrix organisation structure and illustrate it with a neat sketch. Also mention two advantages and two disadvantages of such a structure. (8)

1.3 What is delegation? (2)

1.4 Describe the steps of a performance management discussion as advocated by Nel (prescribed book). (12)

1.5 Describe the interview process. (Hint: What should happen before, during, and after?). (10)

1.6 Describe Hersey and Blanchard's situational theory. Your description should include leadership styles and subordinate categories. (12)

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QUESTION 2

2.1 You invest a sum of R5 000 for a period of six years at an interest rate of 7,5%, compounded annually. What will your investment be worth at the end of this period? (3)

2.2 You borrow an amount of R20 500 at a compounded interest rate of 10,5% per annum and have to pay it back in monthly installments over four years. What will you monthly installment be? (3)

2.3 You have an underground workshop in your mine that is ventilated with an axial flow fan that consumes 4kW of electrical power. The fan runs for 24 hours per day and a mean of 30,5 days per month. The electrical power tariff is 136c/kWh. The workshop will still be operational for the next 11 months. You can develop an airway into the workshop that will make the running of the fan unnecessary, thereby saving the power costs incurred. The airway will be 24m long and take a month to develop at a cost of R850/m. is this a worthwhile option? (10)

2.4 You have been tasked to assess the financial requirements of your mine's Environmental Management Plan. The plan shows that your mine must establish a trust fund of R65 000 000 in order to be issued a closure certificate in 25 years' time when the mine will cease production. The bank has committed to a compounded interest rate of 8,5% per annum. What monthly sum must be deposited into this account to ensure that the R56M will be available at the time required? (6)

2.5 Evaluate the three projects given below in terms of three criteria, and make a selection. Use a compounded discount rate of 11% per annum. (14)

Year	Project 1	Project 2	Project 3
0	- 55 600,00	- 46 700,00	- 42 000,00
1	12 000,00	8 600,00	15 500,00
2	18 000,00	24 000,00	17 000,00
3	24 000,00	27 000,00	22 000,00
4	32 000,00	28 000,00	26 000,00
5	32 000,00	12 000,00	26 000,00
6	34 000,00	8 000,00	28 000,00
7	16 000,00	5 000,00	19 000,00

2.6 You have a small mining operation consisting of 10 panels that each deliver 1 000 tons per month to the mill at a recovery grade of 3,0g/t (gold). You sell your gold at a fixed price of R540g. A blast consultant has offered you an intervention that will improve your face advance, and hence your tonnage by 5%. His fee for the 6 month intervention is a sum of R2,5M, to be paid up front. There is no certainty that the 10% improvement will be sustained after the 6 months period. Is this a worthwhile proposition? (14)

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TOTAL **[100]**

Formulae	
Simple interest	$I = Pni$
Compound interest	$F = P(1+i)^n \quad P = \frac{F}{(1+i)^n}$
Annuity	$F = A\left[\frac{(1+i)^n - 1}{i}\right] \quad P = A\left[\frac{(1+i)^n - 1}{i(1+i)^n}\right]$
Return on investment	$ROI = \frac{\text{Average annual profit}}{\text{Original investment}} \times 100$
Net Present Value	$NPV = \sum_{t=1}^{n} \frac{CF_t}{(1+k)^t} - I$
Payback period	Time taken to gain financial return equal to the original investment.