



PROGRAM : BTech (Mining)
SUBJECT : ENGINEERING MANAGEMENT IVA (S5)
SUBJECT CODE : MGNA411
EXAMINATION : SUPPLEMENTARY FINAL SUMMATIVE
EXAMINATION
DATE : JANUARY 2019
DURATION : 180 MINUTES
TOTAL MARKS : 120

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MODERATOR : Mr. Hein Strauss

NUMBER OF PAGES : 10

INSTRUCTIONS:

1. **PLEASE** answer **ALL** questions
 2. A question means all the sub-questions that appear under the heading of that question. All the sub-questions must be kept together under the heading of a specific question
 3. Number all questions, and associated sub-questions **CLEARLY**
 4. A formulae sheet is herein attached
 5. The use of a calculator is permissible
 6. All the relevant rules of the University of Johannesburg shall apply
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Question 1

- 1.1 List, and explain some of the important skills needed to manage people effectively (i.e. people skills for managers). Group the skills under appropriate headings. (10)
- 1.2 Explain the planning function (2)
- 1.3 Describe the planning process (8)

[20]

Question 2

The activities for a small engineering project are given in the table below.

| Activity | Predecessor | Time (days) | | |
|----------|-------------|-------------|----|----|
| | | a | m | b |
| A | - | 3 | 8 | 6 |
| B | - | 7 | 7 | 3 |
| C | B | 3 | 5 | 7 |
| D | A | 5 | 10 | 13 |
| E | A | 11 | 13 | 18 |
| F | B,D | 6 | 8 | 9 |
| G | C | 7 | 8 | 10 |
| H | C,F | 6 | 7 | 8 |
| I | D | 3 | 6 | 7 |
| J | E | 15 | 17 | 21 |
| K | G | 7 | 9 | 12 |
| L | H | 8 | 9 | 11 |
| M | I,J | 7 | 9 | 12 |
| N | 7 | 12 | 15 | 17 |
| O | L,G | 2 | 3 | 5 |
| P | N | 6 | 7 | 11 |
| Q | O | 15 | 17 | 19 |

- 2.3.1 Prepare the data required for a full network analysis. Show all calculations and neatly tabulate the data
- 2.3.2 Construct the network diagram using the AON convention
- 2.3.3 Find the critical path and the earliest completion time for the project
- 2.3.4 Find the project duration associated with:
 - 2.3.4 (a) An 85% confidence level
 - 2.3.4 (b) A 50% confidence level

(20)

[20]

Question 3

You need to select a project for your company and you have to decide between four projects of which the annual cash flows are tabulated below. Determine the ROI, Payback Period, and NPV of each project and make a decision. Use a discount rate of 15%.

| <u>Year</u> | <u>Project A</u> | <u>Project B</u> | <u>Project C</u> | <u>Project D</u> |
|-------------|------------------|------------------|------------------|------------------|
| 0 | - R 215 000 | - R 400 000 | - R 50 000 | - R 18 000 |
| 1 | - R 15 000 | R 27 000 | - R 200 000 | 0 |
| 2 | R 94 000 | R 315 000 | R 420 000 | R 78 000 |
| 3 | R 100 000 | R 415 000 | R 470 000 | R 135 000 |
| 4 | R 120 000 | R 285 000 | R 475 000 | R 185 000 |
| 5 | R 1555 000 | R 300 000 | R 515 000 | R 272 000 |

(20)

[20]

Question 4

- 4.1 Within the context of engineering contracts and law, explain the following terms:
 - 4.1.1 Conditions (2)
 - 4.1.2 Guarantees (2)
 - 4.1.3 Cancellation clauses; and (2)
 - 4.1.4 Penalty clauses (2)
- 4.2 In your own words, explain the 'parole evidence rule'. List and explain exceptions, if any, to the parole evidence rule

(8)

- 4.3 The population of South Africa is currently estimated 54 million people. List and explain the different aspects of 'legal capacity' as it applies to the different members of the population of South Africa, and entities operating within the boundaries of South Africa

(4)

[20]

Question 5

- 5.1 Distinguish between 'design capacity'; 'effective capacity'; and 'actual output'. Use an appropriate example, and figures, to highlight the differences.

(8)

- 5.2 List and discuss 'capacity planning' objectives. Are these objectives applicable to mining?

(8)

- 5.3 List at least four advantages of flexible manufacturing systems (FMS)

(4)

[20]

Question 6

- 6.1 List and explain the different stages of the training process

(10)

- 6.2 In your own words, explain the concept of 'performance management'

(4)

- 6.3 Explain the following evaluation errors:

6.3.1 Halo effect

(2)

6.3.2 Leniency

(2)

6.3.3 Central tendency

(2)

[20]

TOTAL MARKS [120]
