

**THE UNIVERSITY OF ZAMBIA**  
**SCHOOL OF ENGINEERING**  
**2005 SECOND SEMESTER**

1. EG475      ENGINEERING MANAGEMENT & SOCIETY I
2. EG575      ENGINEERING MANAGEMENT & SOCIETY
3. ME232      PROPERTIES OF ENGINEERING MATERIALS I

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UNIVERSITY OF ZAMBIA  
SCHOOL OF ENGINEERING  
UNIVERSITY SEMESTER II EXAMINATIONS 2005  
(DECEMBER 2005)

EG 475 - ENGINEERING MANAGEMENT AND SOCIETY I

INSTRUCTIONS

1. There are separate instructions for the two sections.
2. Use separate answer booklets for each section.
3. All questions carry equal marks (20 %). Marks for sub-questions are indicated at the end of each sub-question
4. Make sure the computer number is clearly indicated on all the booklets together with the questions attempted

TIME: THREE (3) HOURS

CLOSED BOOK EXAM

SECTION A: ATTEMPT ANY FOUR QUESTIONS.

Question 1

If price rises, demand will fall, if demand rises, prices will rise:

- a) Example these two statements (5 marks)
- b) Illustrate these two statements, i.e., by graphical presentations (5 marks)
- c) What will be the effect of minimum price regulations on demand and supply? Give an example of minimum price legislations in practice (5 marks)
- d) Consider which of the following events would result in a shift of demand curve for bottled mineral water to the right:
  - i. The start of a period of hot weather;
  - ii. A rise in the price of mineral water;
  - iii. A fall in consumers' income;
  - iv. A campaign advising the consumer that tap water is healthy to drink.

**Select one option**

- A event (i) only
- B events (i) and (iii) only
- C events (ii) only
- D events (iii) and (iv) only

Justify your choice

(5 marks)

**Question 2**

- (a) What is meant by the terms "national income"? (8 marks)
- (b) What are the main problems involved in its calculation with particular reference to its suitability as an indicator of the standard of living? (12 marks)

**Question 3**

Consider critically the following:

- (a) The factors necessary for economic growth; (12 marks)
- (b) The benefits derived from economic growth (8 marks)

**Question 4**

In any productive activity it is necessary to combine all three factors of production – discuss the validity of this statement. (20 marks)

**Question 5**

- (a) What is entrepreneurship and its role in national development (give examples) (10 marks)
- (b) Critically discuss the major reasons for the survival of small enterprises in the Zambia industrial sector? (10 marks)

**Question 6**

- (a) The purpose of business is to make a profit and we may define profit as the reward for enterprise and risk discuss above statement with reference to the basis of accounting in business. (10 marks)
- (b) There are three classes of Accounts – describe them and draw them up. (10 marks)

**SECTION B: ATTEMPT ANY ONE QUESTION**

**Question 7**

- (a) Briefly discuss the concept of cleaner production ( 5 marks)
- (b) Discuss how the concept of cleaner production can be applied to:
- i. Production processes ( 5 marks)
  - ii. Products ( 5 marks)
  - iii. Services ( 5 marks)

**Question 8**

- a) What is Technological change? (4marks)
- b) Briefly discuss the major sources of technological change (6 marks)
- c) What role should the Government play in promoting Technological advancement? (6 marks)
- d) Why should Government be involved in the shaping and advancement of Technology? (4 marks)

**Question 9**

- (a) List and briefly discuss the elements that make up an industrial strategy (10 marks)
- (b) In the 20<sup>th</sup> century, a number of developing countries adopted an *import substitution industrialisation trade strategy*. However, this did not yield desired results. Give reasons that led to the failure of this strategy, giving a brief explanation for each. (10 marks)

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END OF EXAMINATION



**The University of Zambia**  
**School of Engineering**  
**EG 575-Engineering, Management and Society 2005**  
**Semester II Final Examination, December 2005**

**Time: Three (3) Hours**

**Closed Book**

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**Instructions**

- i. Answer five (5) questions. Three (3) questions from Section A and two (2) questions from Section B.
  - ii. In Section A, questions three (3) and four (4) are compulsory.
  - iii. Use separate answer scripts for each section and label them clearly.
  - iv. All questions carry equal marks (20 marks).
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**SECTION A**

**Question 1**

- (a) Discuss in detail why strategic planning has become so important to the contemporary organizations.
- (b) Taking environmental factors into account, clearly explain in detail how strategic planning typically evolve in a corporation.

**Question 2**

Using SWOT analysis, how can you formulate strategies for any organization that you are familiar with.

**Question 3**

- (a) Labour laws in Zambia provide solid foundation for sound management relations. Using an appropriate framework that you may be familiar with, briefly discuss at least four purposes of labour laws in Zambia.
- (b) What purpose does the ideology of an industrial relations system serve? Show how this system is regulated in Zambia.
- (c) Briefly explain why you should have some working knowledge of labour laws. Do labour laws offer adequate protection in Zambia?

#### **Question 4**

- (a) Discuss the importance of project organizing and resource allocation in project management.
  - (b) Several sources of conflicts exist in industrial development projects. Illustrate how the Triple C Model can help avoid conflicts in a project.
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#### **SECTION B**

#### **Question 5**

Discuss in detail the following:

- (a) Recruitment of potential employees for a company (recruitment policies inclusive) and personnel specifications, and
- (b) The importance of reference letters required when a potential employee applies for a job.

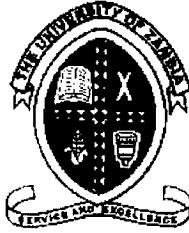
#### **Question 6**

- (a) Write brief notes on the following elements of an employment contract:
  - i. Disciplinary and grievances procedures, and
  - ii. Holidays, sick pay and pension arrangements.
- (b) Cite and describe incidences when an employer can discriminate on the basis of race.
- (c) Discuss in detail work study as part of training and development of an employee.

#### **Question 7**

- (a) What do you understand by the term Multi-national Company and what are some of the main documents required to lodge, with the Registrar of Companies, in order to form any company.
  - (b) Discuss in detail why despite the ultimate duty of a company to its shareholders, it also owes duty to its employees, customers, suppliers, and the public at large.
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**End of EG 575- Engineering, Management and Society, prepared by  
Drs P. C. Chisale, P. Nsombo and Mr. Kazembe © School of Engineering**



THE UNIVERSITY OF ZAMBIA  
SCHOOL OF ENGINEERING  
DEPARTMENT OF MECHANICAL ENGINEERING

UNIVERSITY EXAMINATIONS

2005 ACADEMIC YEAR - SECOND SEMESTER

DECEMBER 2005

ME 232 – PROPERTIES OF ENGINEERING MATERIALS I  
FINAL EXAMINATION

Read the following instructions carefully before you start writing:

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1. Answer Five Questions, two from Section A and three from Section B.
  2. Hand in Sections A and B separately
  3. All Questions carry equal marks
  4. Time allowed is Three (3) Hours
  5. This examination is Closed Book
  6. This question paper has two printed pages including this cover
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**SECTION A: Answer any two questions from this Section**

- Q1. (a) Sketch and fully label the blast furnace used in the production of iron. [10 marks]  
(b) Discuss the various processes that take place during the production of iron in the blast furnace. [10 marks]
- Q2. Discuss in detail each of the following:  
(a) Annealing of steel [10 marks]  
(b) Ionic crystals [10 marks]
- Q3. (a) Discuss strain aging and sketch a typical stress-strain curve of a material that exhibits strain aging. [08 marks]  
(b) Describe each of the following:  
(i) Ferrite. [04 marks]  
(ii) Austenite. [04 marks]  
(iii) Cementite. [04 marks]

**SECTION B: Answer any three questions from this Section**

- Q4. (a) Define electrochemical corrosion. [03 marks]  
(b) Differentiate between oxidation and reduction in metal corrosion [05 marks]  
(c) Describe one method and the principle involved by which each of the following may be protected against corrosion:  
(i) an exposed steel power transmission pylon at ambient temperature. [03 marks]  
(ii) a steel boiler. [03 marks]  
(iii) a ship's hull. [03 marks]  
(iv) a buried steel pipeline. [03 marks]
- Q5. (a) What is a polymer? Mention the three major classes of polymers, stating their basic differences? [05 marks]  
(b) Describe in detail the two main ways polymerisation may take place. [06 marks]  
(c) Compare and contrast the mechanical properties of thermoplastics, thermosetting plastics and elastomers, stating at least three industrial applications of each. [09 marks]
- Q6. (a) State applications where ceramics have distinct advantages over metals and why. [05 marks]  
(b) What are basic differences between polymer and ceramic composites? [05 marks]  
(c) Give five classes of generic ceramics and glasses, stating their compositions. Give at least three specific applications of each class, justifying why they are suitable for such applications. [10 marks]
- Q7. (a) What is 'doping' in semiconductor theory and what is its significance? [05 marks]  
(b) Distinguish in detail between *n*-type and *p*-type semiconductors. [12 marks]  
(c) Explain in detail what would happen, and why, as the temperature of a doped semiconductor in an electric circuit is increased from absolute zero to just below its melting point. [03 marks]

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**END OF ME 232 EXAMINATION**  
**Dr C K Wamukwamba / G M Munakaampe**