



**NAMIBIA UNIVERSITY  
OF SCIENCE AND TECHNOLOGY**

**FACULTY OF ENGINEERING AND THE BUILT ENVIRONMENT**

**DEPARTMENT OF LAND AND SPATIAL SCIENCES**

<b>QUALIFICATION(S):</b> BACHELOR OF PROPERTY STUDIES DIPLOMA IN PROPERTY STUDIES	
<b>QUALIFICATION(S) CODE:</b> 08BPRS 06DPRS	<b>NQF LEVEL:</b> 6
<b>COURSE CODE:</b> PMT611S	<b>COURSE NAME:</b> PROPERTY MAINTENANCE
<b>EXAMS SESSION:</b> JULY 2023	<b>PAPER:</b> THEORY
<b>DURATION:</b> 3 HOURS	<b>MARKS:</b> 100

<b>SECOND OPPORTUNITY / SUPPLEMENTARY EXAMINATION QUESTION PAPER</b>	
<b>EXAMINER(S)</b>	ELINA TEODOL
<b>MODERATOR:</b>	VERINJAERAKO KANGOTUE

<p style="text-align: center;"><b>INSTRUCTIONS</b></p> <ol style="list-style-type: none"><li>1. Read the entire question paper before answering the Questions.</li><li>2. Please write clearly and legibly!</li><li>3. The question paper is made up of questions in <b>3 SECTIONS</b>.</li><li>4. You must answer <b>ALL QUESTIONS IN ALL THE 3 SECTIONS</b>.</li><li>5. Make sure your Student Number is on the EXAMINATION BOOK(S).</li></ol>
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**PERMISSIBLE MATERIALS**

1. Non-programmable Scientific Calculator

**THIS QUESTION PAPER CONSISTS OF 9 PAGES** (Including this front page)

**SECTION A**

Choose the correct answer for each of the following multiple-choice questions. Each correct answer carries 1 mark. (20)

- 1) The goal of maintenance is to maintain an asset in good working order while minimizing:
  - A) Total preventive maintenance costs
  - B) Total breakdown maintenance costs
  - C) Total maintenance costs
  - D) The difference between preventive and breakdown costs
  - E) The ratio of breakdown to preventive maintenance costs
  
- 2) The Life Cycle Costings (LCC) of an asset over its life cycle does not include \_\_\_\_\_.
  - A) Acquisition costs
  - B) Maintenance costs
  - C) Operating costs
  - D) Replacement costs
  - E) Environmental costs
  
- 3) Which of the following is a major approach used in Maintenance plans for breakdowns?
  - A) Standby equipment
  - B) Inventories of spare parts
  - C) Operator repair of minor problems
  - D) Readily available repair personnel
  - E) All of these are major approaches.
  
- 4) The major responsibilities of the property maintenance professional during a construction project include all the following except:
  - A) Represent owner and advise and consult with owner
  - B) Generate complete drawings and specs and bid process and contractor selection

- C) Verify work and materials conform to requirements and periodically inspect project
- D) Prepare punch lists and complete the joinery work
- 5) All the following are the most common challenges revolving around building maintenance EXCEPT:
- A) Speculative development.
  - B) Controlling costs.
  - C) Extending Asset Lifespan
  - D) Record keeping and Data analysis.
- 6) The optimum amount of preventive maintenance is where:
- A) Total breakdown costs are a minimum.
  - B) Total preventive maintenance costs are a minimum.
  - C) Each maintenance component cost is a minimum.
  - D) Total maintenance costs are a maximum.
  - E) Total maintenance costs are a minimum.
- 7) The process that is intended to find potential failures and make changes or repairs is known as \_\_\_\_\_
- A) Troubleshooting.
  - B) Failure maintenance.
  - C) Breakdown maintenance.
  - D) Preventive maintenance.
- 8) Which of the following best explain the behaviour of the Total Maintenance Cost Curve (which is made up of preventive maintenance cost plus breakdown and repair cost):
- A) It slopes up as the number of preventive maintenances increase
  - B) It slopes down as the number of preventive maintenances increase
  - C) It starts low, increases rapidly and then drops back down as the number of preventive maintenances increase

- D) It starts high, drops gradually but then goes back up as the number of preventive maintenances increase
- E) It remains relatively flat as the number of preventive maintenances increase
- 9) Which of the following is the type of maintenance which is periodic in nature?
- A) Breakdown maintenance
  - B) Predictive maintenance
  - C) Preventive maintenance
  - D) Corrective maintenance
  - E) All of the above
- 10) Upkeep, minor repairs, maintenance painting etc. would be classified as:
- A) Preventive maintenance
  - B) Predictive maintenance
  - C) Routine maintenance
  - D) Corrective maintenance
- 11) Verifying that the floor is clean and free of debris is part of a \_\_\_\_\_ housekeeping inspection.
- A) Corrective
  - B) Scheduled
  - C) Time-based
  - D) Emergency
- 12) Which of the following is included in a Service Level Agreement (SLA) for maintenance purposes?
- A) Maintenance procedures, downtime allowances, warranties, privacy issues, security procedures, and responsibilities of both parties
  - B) Maintenance procedures, work orders, privacy issues, duties of both parties

- C) Target, obligations, policies, performance, warranties, and procedures
- 13) Which of the following is the best definition of Life Cycle Costing?
- A) Determining the sum of all the costs associated with an asset
  - B) Projecting the cash flow over the term of proposed permanent financing
  - C) Calculating the payback to determine the desirability of an investment
- 14) All the following are a feature of Service Level Agreement (SLA) except?
- A) SLA is used as a legal document for imposing penalties.
  - B) Information included within an SLA is measurable.
  - C) The language used in an SLA should be clear and concise.
  - D) SLA provides one service for all customers of that service.
- 15) A tender is in the nature of:
- A) A contract
  - B) An invitation to offer
  - C) An offer
  - D) A proposal
- 16) Which tender allows anyone to submit a tender to supply goods or services that are required.
- A) Framework tendering
  - B) Open tendering
  - C) Close tendering
  - D) Selective tendering
- 17) Which of the following would not improve the performance of a breakdown programme?
- A) More trained personnel
  - B) Short lead times for replacement parts
  - C) Standby equipment



- D) Cross-training repair personnel
  - E) Reducing inventories of spare parts
- 18) Who is responsible for the specific costs and risks associated with providing a service?
- A) The service provider
  - B) The service level manager
  - C) The customer
  - D) The finance department
- 19) You are operating a machine and the same problem keeps happening after every 2 hours of run time. What should be done?
- A) Check the maintenance history for similar problems
  - B) Frequency of maintenance
  - C) Wait for an emergency
  - D) Use time-based maintenance
- 20) You are organising the work area around a specific machine and come across a pile of papers. What paper among the pile will you consider an important document that needs to be kept?
- A) Work order
  - B) Maintenance log
  - C) Contract
  - D) SLA

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**SECTION B**

For each of the following statements indicate whether it is 'TRUE' or 'FALSE'. Each correct answer carries 1 mark. (15)

- 1) Life-cycle costing is an analytical technique for evaluating time-phased costs and revenues attributable to a project or an asset or component over a specific planning period. (1)
- 2) Prescriptive standards tell the contractor exactly what to do and how to do it. (1)
- 3) Preventive maintenance is defined as pre-breakdown work performed on equipment and systems designed to lesson or eliminate premature breakdown. (1)
- 4) Prioritising of maintenance work is a process of assessing the urgency of required maintenance work and ranking the work accordingly. (1)
- 5) Routine maintenance involves the tasks that are done immediately to prevent further damage or severe impacts on an item. (1)
- 6) The goal of using contractors and outsourcing is to get maintenance or construction work done at a higher quality, faster, safer or at high cost than it would be possible with the company's crew. (1)
- 7) The two categories of standards are performance and prescriptive. (1)
- 8) The use of outside contractors for maintenance is more expensive than in-house maintenance. (1)
- 9) Service level agreements (SLAs) are part of a quality approach to help teams identify and agree what 'good quality' looks like and provide a framework for measuring and monitoring the success of service quality. (1)
- 10) The Life Cycle Stages are the same for human beings and assets. (1)
- 11) The Life Cycle Costing (LCC) of an asset includes the cost of its initial capital, occupation, operating, and disposal costs. (1)

- 12) Adequate supervision of new construction, alteration, and repair work is necessary to ensure compliance with building requirements. (1)
- 13) Restoration is a more restrictive term than rehabilitation and suggests replicating the structure as originally built. (1)
- 14) The effects of obsolescence and redundancy can include conversion/refurbishment/renewal or demolition. (1)
- 15) Technical requirements must always be prioritized over economic considerations when planning maintenance. (1)
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### SECTION C

#### Question 1

- a) With the aid of illustration (examples), briefly distinguish between the following terms as used in property maintenance.
- i) Planned maintenance and Unplanned maintenance (4)
  - ii) Preventive maintenance and Emergency maintenance (4)
  - iii) Maintenance standards and modernisation (3)
- b) Identify the three (3) essential ingredients of the building conversion process. (3)
- c) Enumerate five (5) advantages of using In-house labour and any five (5) advantages of outsourcing. (10)
- [24]**
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#### Question 2

- a) What is Life Cycle Costing (LCC) of an asset? (2)
- b) State three (3) common problems in maintenance according to McDuling (2000). (3)
- c) Briefly explain the difference between the following as used in property maintenance industry:



- i) Structural defects and Non-structural defect (4)
  - ii) Corrective and Cosmetic Maintenance (4)
  - iii) Conceptual and Detailed Budget (4)
- d) State the three (3) types of planning charts that can be used for scheduling maintenance jobs. (3)
- e) Building maintenance is of great significance to the economy not only because of the scale of expenditure involved but also as a factor of production and of accommodation. List the four (4) factors that influence maintenance of any building. (4)

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**Question 3**

- a) Define the following terms as used in property maintenance. (3)
- i) Servicing (1)
  - ii) Rectification (1)
  - iii) Replacement (1)
- b) What are inspection cycles and why are they important for maintenance services? (2)
- c) State the eight (8) basic principles of tendering process in the construction industry. (4)
- d) Mr Kaveterua owns Mbemumuna & Sons Property Maintenance Company. To achieve the company's objective, he must consider several strategies for contracting out maintenance work. Outline the four (4) types of maintenance contracts that he may adopt. (2)
- e) State the three (3) causes of Contract changes in the building maintenance industry. (3)
- f) What are the three (3) basic levels of the planning process? (3)

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