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2. Draw and explain Bathtub curve in the life span of machine tools.
  3. Write short notes on :
    - a) Spirit level test
    - b) Straight edge test
    - c) Auto collimator
    - d) Vernier caliper
  4. Discuss the reasons of failure and repair schedule of the parts.
  5. Explain the concept of handling and storage of lubricants.
  6. Define the lubricant grades and discuss the lubricant grades of the following component:
    - a) Gears box
    - b) Bearing system
    - c) Chain
  7. Explain with examples Principles of Material Handling.
  8. Write short notes on:
    - a) AGV system
    - b) Automated storage & retrieval system
    - c) Forklift trucks

==END OF PAPER==

**DIPLOMA OF VOCATION**  
**Mechanical Manufacturing**  
**Subject: Plant Maintenance & Material Handling**  
**Subject Code: ME-506**  
**Semester: Fifth**  
**December 2021**  
**Theory (External): 70 Marks**  
**Time: 03 Hours**

**Instructions to the Students**

1. This Question paper consists of two Sections. All sections are compulsory.
2. Section A comprises 10 questions of objective type in nature. All questions are compulsory. Each question carries 2 mark.
3. Section B comprises 8 essay-type questions out of which students need to do any 5. Each question carries 10 marks.
4. Read the questions carefully and write the answers in the answer sheets provided.
5. Do not write anything on the question paper.
6. Wherever necessary, the diagram drawn should be neat and properly labelled

Roll Number									

**SECTION -A (SHORT/OBJECTIVE TYPE QUESTIONS)**

(10x2=20 Marks)

- A. The following is not a classification of maintenance
- a) Preventive maintenance
  - b) Timely maintenance
  - c) Predictive maintenance
  - d) Shutdown maintenance
- B. Failure occurs due to defective parts during the .....
- a) Wear out stage
  - b) Normal life stage
  - c) Early life stage
  - d) None
- C. What is the practical application of alignment test?
- D. What is the practical application of compressors and boilers?
- E. What are the grades of a lubricating oil?
- F. Which of the Following is used to test straightness of the bed in the transverse direction of long beds?
- a) Spirit level
  - b) Vernier caliper
  - c) Slip gauge
  - d) None
- G. Pitting corrosion failure occurs on..... of the component
- a) Surface

- b) Inner body
  - c) Inside or on surface
  - d) Outside
- H. Which of the following is the most important property of the lubricants?
- a) Density
  - b) Thermal conductivity
  - c) Viscosity
  - d) Melting point
- I. Material handling consists of movement of material from
- a) one machine to another
  - b) one shop to another shop
  - c) stores to shop
  - d) all of the above
- J. Economy in material handling can be achieved by
- a) employing gravity feed movements
  - b) minimizing distance of travel
  - c) by carrying material to destination without using manual labour
  - d) all of the above

**SECTION -B (ESSAY TYPE QUESTIONS)**

(5x10=50 Marks)

1. Describe the concept of preventive maintenance. How does it differ from Breakdown maintenance?