

Total No. of printed pages = 7

**END SEMESTER EXAMINATION – 2022**

Semester : 5th

Subject Code : Me-503

**PLANT MAINTENANCE ENGINEERING**

Full Marks – 70

Time – Three hours

The figures in the margin indicate full marks  
for the questions.

**Instructions :**

1. *All* questions of PART-A are compulsory.
2. Answer any *five* questions from PART-B.

**PART – A**

Marks – 25

1. Fill in the blanks : 1×10=10
  - (i) Maintenance cost is too \_\_\_\_\_ in predictive maintenance.
  - (ii) In an spirit level for a plain horizontal surface, air bubble will be at \_\_\_\_\_ position.

[Turn over

- (iii) Feeler gauges are used to check \_\_\_\_\_ between the mating surfaces.
- (iv) Woodruff keys have the geometrical form of a segment of a \_\_\_\_\_.
- (v) In antifriction bearing sliding friction has been substituted by \_\_\_\_\_ friction.
- (vi) In Worm gears noise and vibration are \_\_\_\_\_.
- (vii) In interference fit smallest shaft diameter is \_\_\_\_\_ than largest hole diameter.
- (viii) Popular materials for static seal or gaskets are \_\_\_\_\_.
- (ix) The non-linearity across the guideways is called \_\_\_\_\_.
- (x) Two examples of boiler mountings are \_\_\_\_\_.

2. State true or false :

$$1 \times 10 = 10$$

- (i) Breakdown maintenance is suitable for large scale industries.
- (ii) Ring gauges are used to check external measurements.

- (iii) Push fit is a type of interference fit.
- (iv) For a hole basis system shaft diameter remains constant.
- (v) Labyrinth seal are used at extremely high speed.
- (vi) The shape and size of foundation differ according to the type of machine or engine.
- (vii) Couplings are used to connect shaft ends together for transmitting force.
- (viii) If extent of wear is less than 0.3 mm grinding is done in guide surface maintenance.
- (ix) Grease is a semi liquid lubricant.
- (x) Galvanising is a hot coating process.

3. Choose the correct answer :  $1 \times 5 = 5$

- (i) Micrometer measures dimensions upto an accuracy of
  - (a) 0.1 mm
  - (b) 0.01 mm
  - (c) 0.00 1mm
  - (d) None of these

- (ii) For a hole maximum material limit is
- (a) Inner diameter      (b) Outer diameter
  - (c) Cannot be said      (d) None of these
- (iii) The quick removal of metal surface from a gear tooth surface is called
- (a) Scratching              (b) Ridging
  - (c) Scoring                  (d) Polishing
- (iv) Major function of lubrication is
- (a) To minimise friction
  - (b) To minimise wear and tear
  - (c) To carry out heat generated due to friction, leaving the assembly cool as far as practicable
  - (d) All of the above
- (v) Water hammering occurs when water run through pipe at
- (a) Low velocity      (b) Medium velocity
  - (c) High velocity      (d) None of these



## **PART – B**

**Marks – 45**

4. (i) What is maintenance ? What are its major objectives ? 4
- (ii) What are different types of maintenance ? Write advantages of each one. 5
5. (i) Write down the uses of the following hand tools mentioned below : 5
- (a) Dial Indicator
  - (b) Micrometer
  - (c) Scraper
  - (d) Wrench
  - (e) Plug gauge
- (ii) What are different types of files ? What procedure will you follow for file maintenance ? 4
6. (i) Show the following fits in a shaft and hole assembly with the help of a diagram : 3
- (a) Clearance fit
  - (b) Interference fit
  - (c) Transition fit

- (ii) What do you mean by hole basis and shaft basis system ? 2
- (iii) Define the following in an hole shaft assembly : 4
- (a) Clearance
  - (b) Allowance
  - (c) Fundamental deviation
  - (d) Basic size
7. (i) What are different types of keys ? What procedure will you follow for fitting of keys ? 3
- (ii) How gear tooth failure occurs ? What are its remedies ? 3
- (iii) What is coupling ? What are the preventive measures of coupling failure ? 3
8. (i) What are the purposes of using lubricant ? 3
- (ii) What are the properties of a good lubricant ? 3
- (iii) What is water hammering ? What preventive measures will you take to overcome it ? 3

9. (i) Mention the causes of wear on guide surface. What are different checkings to be made on the guide surfaces ? 4
- (ii) Distinguish between static and dynamic seal. State some common examples of application of packing and gaskets. 5
10. (i) Write down five examples of pipe fittings with neat sketch. 5
- (ii) Why corrosion occurs ? What are different types of corrossions ? State some remedies. 4