

**R.N.G.PATEL INSTITUTE OF TECHNOLOGY-RNGPIT**  
(An Autonomous College U/s UGC Act 1956)

**B. Voc. SEMESTER-II, SEMESTER END EXAMINATION – SUMMER 2025**

**Subject Code: 1PT202****Date: 19-05-2025****Subject Name: MAINTENANCE & SAFETY ENGINEERING****Time: 11:00 AM to 01:00 PM****Total Marks: 50****Instructions**

1. It is **compulsory** for students to write **Enrolment No. /Seat No.** on the question paper.
2. Attempt all questions in the question paper.
3. The figures to the right of each question indicate full marks. Make suitable assumptions with proper justification wherever required.
4. Simple, non-programmable scientific calculators are permitted.
5. BL - Bloom's Taxonomy Levels (R-Remember, U-Understanding, A-Application, N-Analyze, E-Evaluate, C-Create), CO - Course Outcomes.

	<b>Marks</b>	<b>BL</b>	<b>CO</b>
<b>Q.1 Multiple-Choice Questions</b>	<b>[05]</b>		
(a) Which tool is NOT commonly used in maintenance work?	<b>1</b>	<b>R</b>	<b>1</b>
(i) Hammer			
(ii) Measuring instruments			
(iii) Screwdriver			
(iv) Typewriter			
(b) Which is a disadvantage of breakdown maintenance?	<b>1</b>	<b>R</b>	<b>2</b>
(i) Lower initial cost			
(ii) Increased unplanned downtime			
(iii) No planning required			
(iv) Requires less staff			
(c) If a petrol engine fails to start, what is the first possible fault to check?	<b>1</b>	<b>U</b>	<b>4</b>
(i) Incorrect spark timing			
(ii) Fault in spark plug			
(iii) Empty petrol tank			
(iv) Air in the petrol line			
(d) Which type of hearing protection device completely covers the ears?	<b>1</b>	<b>U</b>	<b>5</b>
(i) Earplugs			
(ii) Semi-inserts			
(iii) Earmuffs			
(iv) Face shield			

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|---|----------|----------|----------|
| (e) If 10 devices are tested for 400 hours, and 2 failures occur, what is the MTBF? | <b>1</b> | <b>A</b> | <b>3</b> |
| (i) 2000 hours/failure  |          |          |          |
| (ii) 4000 hours/failure   |          |          |          |
| (iii) 1000 hours/failure  |          |          |          |
| (iv) 800 hours/failure  |          |          |          |

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|--|-----------------|----------|----------|
| <b>Q.2 Attempt Any Three</b>   | <b>[15]</b>     |          |          |
| (a) Enlist different types of tools used for maintenance work.   | <b>5</b>        | <b>R</b> | <b>1</b> |
| (b) List the responsibility of maintenance department.   | <b>5</b>        | <b>R</b> | <b>1</b> |
| (c) Write short note on total productive maintenance.  | <b>5</b>        | <b>U</b> | <b>2</b> |
| (d) State the difference between preventive and predictive maintenance.  | <b>5</b>        | <b>U</b> | <b>2</b> |
| <br><b>Q.3 Attempt Any Three</b>   | <br><b>[15]</b> |          |          |
| (a) Define reliability and explain its importance.   | <b>5</b>        | <b>R</b> | <b>3</b> |
| (b) Explain MTBF in detail.  | <b>5</b>        | <b>U</b> | <b>3</b> |
| (c) Explain Bathtub curve with neat sketch.  | <b>5</b>        | <b>U</b> | <b>3</b> |
| (d) Let's assume we tested 3 desktop hard drives. The first one failed after 500,000 hours, the second one failed after 600,000 hours, and the third hard drive failed after 700,000 hours in use. Find the MTTF in this instance. | <b>5</b>        | <b>A</b> | <b>3</b> |
| <br><b>Q.4 Attempt Any Three</b>   | <br><b>[15]</b> |          |          |
| (a) Write short note on fault tracing.   | <b>5</b>        | <b>U</b> | <b>4</b> |
| (b) Prepare a decision tree for petrol engine fails to start.  | <b>5</b>        | <b>A</b> | <b>4</b> |
| (c) List different types of safety equipment.  | <b>5</b>        | <b>R</b> | <b>5</b> |
| (d) Write the salient features of factories act 1948.  | <b>5</b>        | <b>R</b> | <b>5</b> |

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