

Code No: **R231207**

**R23**

**SET - 1**

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY GURAJADA VIZIANAGARAM**

**I B. Tech II Semester Supplementary Examinations Dec-2025 / Jan 2026**

**BASIC CIVIL AND MECHANICAL ENGINEERING**

(Common to CE, EEE, AME, MECH & ECE)

Time: 3 hours

Max. Marks: 70

***Question paper consists of Part A & Part B***

***All the questions in Part-A is Compulsory***

***Answer ONE Question from Each Unit in Part-B***

***In Part A – Q.No. 1.a) to e) and in Part B Q.No. 2 to 4 should be answered at one place (may be upto page no. 17).***

***In Part A – Q.No. 1.f) to j) and in Part B Q.No. 5 to 7 should be answered at one place (may be from page no.18 to 32) in answer script.***

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**PART A**

All questions compulsory

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|----|----|--|----|
| 1. | a. | Outline the role of Geotechnical Engineers.                | 1M |
|    | b. | List the types of pavements used in road construction.     | 1M |
|    | c. | Define the term Bearing.                                   | 1M |
|    | d. | List the instruments used for leveling.                    | 1M |
|    | e. | Explain Rain Water Harvesting.                             | 1M |
|    | f. | What is the role of mechanical engineering in society?     | 1M |
|    | g. | Give example for composites.                               | 1M |
|    | h. | Define smart manufacturing.                                | 1M |
|    | i. | State the importance of power plants.                      | 1M |
|    | j. | What is the difference between belt drive and chain drive? | 1M |

**PART B - BASIC CIVIL ENGINEERING**

**UNIT I**

- |    |   |   |    |
|----|---|---|----|
| 2. | a | i) What are the primary responsibilities of a civil engineer in modern society? | 5M |
|    |   | ii) Employ the role of steel reinforcement in Reinforced Concrete Structures.   | 5M |
|    |   | <b>(OR)</b>   |    |
|    | b | i) Outline the principles of building planning.                                 | 5M |
|    |   | ii) Explain the objectives of Structural Engineering.                           | 5M |

**UNIT-II**

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|----|---|---|----|
| 3. | a | i) Explain the objectives of surveying  | 4M |
|    |   | ii) A dumpy level is set up at a station. The readings on a staff held at points A and B are 1.245 m and 2.005 m respectively. Calculate the RL of point B if RL of A is 100.000 m. | 6M |
|    |   | <b>(OR)</b>   |    |
|    | b | i) Explain different types of chains used for the horizontal measurement.   | 4M |
|    |   | ii) Define a contour and its characteristics.   | 6M |

**UNIT-III**

- |    |   |   |     |
|----|---|---|-----|
| 4. | a | Differentiate between Flexible Pavement and Rigid Pavement based on the criteria load distribution, initial cost, maintenance, life span. | 10M |
|    |   | <b>(OR)</b>   |     |
|    | b | Illustrate different components of Harbour with neat sketch.  | 10M |

## **PART B - BASIC MECHANICAL ENGINEERING**

### **UNIT I**

5. a i) Explain the classification of engineering materials. 5M  
ii) State the composition and application of any four ferrous metals. 5M  
(OR)  
b i) Write the differences between Ferrous and Non-Ferrous metals. 5M  
ii) Define smart material. Explain the types of smart materials. 5M

### **UNIT-II**

6. a i) State advantages and limitations of water tube boilers. 5M  
ii) List the components of electric vehicles? Explain. 5M  
(OR)  
b i) What is casting? Explain the principle of casting with neat sketch. 5M  
ii) Discuss the types of CNC's and enlist the profitable applications of CNC? 5M

### **UNIT-III**

7. a i) Explain the open belt and cross belt drive in power transmission. Also give the applications. 5M  
ii) Explain the use of robots in medical applications. 5M  
(OR)  
b i) Explain the working principle of hydro power plant with neat sketch. 5M  
ii) Describe the working principle of nuclear power plants. 5M

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