

I B. Tech I Semester Regular Examinations, January-2024
BASIC CIVIL AND MECHANICAL ENGINEERING

(Common to EEE, CSE, Chemical, FT, PT, Ph. E)

Time: 3 hours

Max. Marks: 70

Note: 1. Question paper consists of two parts (Part-A and Part-B)
2. All the questions in Part-A is Compulsory
3. Answer ONE Question from Each Unit in Part-B

PART –A (10 Marks)

1. a) Write various disciplines of civil engineering. [1M]
- b) What are the leveling instruments used for leveling? [1M]
- c) What is Hydrology? [1M]
- d) Write the types of Pavements. [1M]
- e) What are the construction materials? [1M]
- f) List the mechanical engineer work on marine sectors. [1M]
- g) Define composite. [1M]
- h) Define smart manufacturing. [1M]
- i) Compare Otto and Diesel cycles. [1M]
- j) List the gear drives applications. [1M]

PART – B (60 Marks)

Basic Civil Engineering

UNIT-I

2. a) Discuss the role of civil engineers in society. [5M]
- b) Discuss about the various types of Aggregates with their sizes and shapes. [5M]

(OR)

3. a) Explain the importance of Building Construction and Planning. [5M]
- b) Explain the purpose of studying Geo-technical Engineering. [5M]

UNIT-II

4. a) Write a few objectives of Surveying. [5M]
- b) What is leveling? Write a few types of leveling. [5M]

(OR)

5. a) Explain how to do Angular Measurements using surveying instruments? [5M]
- b) Write briefly about contour mapping. [5M]

UNIT-III

6. a) Discuss about Rainwater Harvesting. [5M]
- b) Explain the Sources of water. [5M]

(OR)



7. Write the importance of Transportation in Nation's economic development. [10M]

Basic Mechanical Engineering

UNIT-I

8. a) Explain the mechanical engineer work on automotive sectors. [5M]
b) Discuss the types, properties and applications of ceramics. [5M]

(OR)

9. a) Explain the classification of engineering materials. [5M]
b) Define smart material. Explain the types of smart materials and their functions. [5M]

UNIT-II

10. a) What are the important types of metal joining processes? [5M]
b) Discuss the types of CNC's and enlist the profitable applications of CNC? [5M]

(OR)

11. a) State advantages and limitations of water tube boilers. [5M]
b) Discuss the classification of IC engines. [5M]

UNIT-III

12. a) Describe the working principle of nuclear power plants. [5M]
b) Explain the open belt and cross belt drive in power transmission. Also give the applications. [5M]

(OR)

13. a) Sketch a robot and name its parts. [5M]
b) Explain the different applications of robots. [5M]



I B. Tech I Semester Regular Examinations, January-2024
BASIC CIVIL AND MECHANICAL ENGINEERING

(Common to EEE, CSE, Chemical, FT, PT, Ph. E)

Time: 3 hours

Max. Marks: 70

Note: 1. Question paper consists of two parts (Part-A and Part-B)
2. All the questions in Part-A is Compulsory
3. Answer ONE Question from Each Unit in Part-B

PART –A (10 Marks)

- | | | | |
|----|----|--|------|
| 1. | a) | Write the scope of studying structural engineering. | [1M] |
| | b) | Discuss the purpose of Surveying. | [1M] |
| | c) | Write a few types of Dams. | [1M] |
| | d) | Write the specifications for quality of water. | [1M] |
| | e) | Write the types of measurements in surveying. | [1M] |
| | f) | List any four applications of smart materials. | [1M] |
| | g) | What is 3D Printing? List its applications. | [1M] |
| | h) | Differentiate between SI and CI engine. | [1M] |
| | i) | Enlist various belt drives. Name any three belt materials. | [1M] |
| | j) | Write the name of different types of power plant. | [1M] |

PART – B (60 Marks)

Basic Civil Engineering

UNIT-I

- | | | | |
|----|----|---|------|
| 2. | a) | Write the ingredients used in Cement concrete and its proportions. | [5M] |
| | b) | Write the purpose of studying Hydraulics and Water Resources Engineering. | [5M] |

(OR)

- | | | | |
|----|----|--|------|
| 3. | a) | Explain the purpose of studying Environmental Engineering. | [5M] |
| | b) | Write the purpose of studying Transportation Engineering. | [5M] |

UNIT-II

- | | | | |
|----|----|--|------|
| 4. | a) | Explain how to do Horizontal Measurements using surveying instruments. | [5M] |
| | b) | Explain about compass Surveying. | [5M] |

(OR)

- | | | | |
|----|----|--|------|
| 5. | a) | Explain the purpose of Leveling instruments. | [5M] |
| | b) | Write a few temporary adjustments in Leveling instruments. | [5M] |



UNIT-III

6. a) Explain any two types of Highway Pavements. [5M]
b) Write the various instruments used for horizontal measurement. [5M]

(OR)

7. a) Write the difference between Flexible Pavements and Rigid Pavements. [5M]
b) Discuss about the need of a) Harbour b) Tunnel c) Airport. [5M]

Basic Mechanical Engineering**UNIT-I**

8. a) Explain the mechanical engineer work on marine sectors. [5M]
b) List Engineering Materials on basis of natural and manmade existence. [5M]

(OR)

9. a) State the composition and application of any four ferrous metals. [5M]
b) What are the key applications of composite materials in Aerospace and Automotive industries? [5M]

UNIT-II

10. a) What is casting? Explain the principle of casting with neat sketch. [5M]
b) Using a block diagram, explain components of a CNC machine. [5M]

(OR)

11. a) What are the industrial applications of air conditioning? [5M]
b) List the components of electric vehicles? Explain. [5M]

UNIT-III

12. a) Explain the working principle of hydro power plant with neat sketch. [5M]
b) Write short note on chain drives. [5M]

(OR)

13. a) List the types of robot configurations? Explain any one with neat sketch. [5M]
b) Explain the use of robots in medical applications. [5M]

2 of 2



I B. Tech I Semester Regular Examinations, January-2024
BASIC CIVIL AND MECHANICAL ENGINEERING

(Common to EEE, CSE, Chemical, FT, PT, Ph. E)

Time: 3 hours

Max. Marks: 70

Note: 1. Question paper consists of two parts (Part-A and Part-B)
2. All the questions in Part-A is Compulsory
3. Answer ONE Question from Each Unit in Part-B

PART –A (10 Marks)

- | | | | |
|----|----|--|------|
| 1. | a) | Write any four construction materials. | [1M] |
| | b) | Write a few instruments used in Surveying. | [1M] |
| | c) | Draw the sketch of dam. | [1M] |
| | d) | Write the types of chains in surveying. | [1M] |
| | e) | Write briefly about Conveyance Structures. | [1M] |
| | f) | What is the role of mechanical engineering in society? | [1M] |
| | g) | Define casting. List the casting defects. | [1M] |
| | h) | List out the applications of refrigeration system. | [1M] |
| | i) | What is the difference between belt drive and chain drive? | [1M] |
| | j) | List the various degrees of freedom in robot configurations. | [1M] |

PART – B (60 Marks)

Basic Civil Engineering

UNIT-I

- | | | | |
|----|----|--|------|
| 2. | a) | Explain about Prefabricated construction Techniques. | [5M] |
| | b) | Discuss the role of steel in building construction. | [5M] |

(OR)

- | | | | |
|----|----|--|------|
| 3. | a) | Explain about the mix proportion of cement concrete. | [5M] |
| | b) | Explain any two basic tests on cement concrete. | [5M] |

UNIT-II

- | | | | |
|----|----|--|------|
| 4. | a) | Write the importance of using leveling instrument in civil construction works. | [5M] |
| | b) | Explain how to use leveling instrument on site. | [5M] |

(OR)

- | | | | |
|----|----|--|------|
| 5. | a) | Write the purpose of drawing contours. | [5M] |
| | b) | Explain about contour intervals with sketch. | [5M] |

UNIT-III

- | | | | |
|----|----|--|------|
| 6. | a) | Draw hydrological cycle and mention its parts. | [5M] |
| | b) | What are the components and functions of rigid pavement? | [5M] |



(OR)

7. a) What are the components and functions of flexible pavement? [5M]
b) Explain about Quality of water. [5M]

Basic Mechanical Engineering**UNIT-I**

8. a) Compare mechanical engineering to the other traditional engineering fields. [5M]
b) Write the differences between Ferrous and Non-Ferrous metals. [5M]

(OR)

9. a) Explain composite materials with its properties and applications. [5M]
b) Explain types and properties of ceramics. [5M]

UNIT-II

10. a) Explain the manufacturing process of forming. [5M]
b) Write short note on smart manufacturing. [5M]

(OR)

11. a) List the components of hybrid vehicles? Explain. [5M]
b) Explain the working of two stroke petrol engine with neat sketch. [5M]

UNIT-III

12. a) Describe the working principle of steam power plants. [5M]
b) Write a short note on the classification of gears. [5M]

(OR)

13. a) Write short note on robot joints and links. [5M]
b) "Robots find applications not only in the industry"- Explain three non-industrial applications of robots. [5M]



I B. Tech I Semester Regular Examinations, January-2024
BASIC CIVIL AND MECHANICAL ENGINEERING

(Common to EEE, CSE, Chemical, FT, PT, Ph. E)

Time: 3 hours

Max. Marks: 70

- Note: 1. Question paper consists of two parts (Part-A and Part-B)*
2. All the questions in Part-A is Compulsory
3. Answer ONE Question from Each Unit in Part-B

PART –A (10 Marks)

- | | | | |
|----|----|--|------|
| 1. | a) | Write the various sizes of Bricks. | [1M] |
| | b) | What is the use of chain survey? | [1M] |
| | c) | Write the difference between Azimuth and Bearing. | [1M] |
| | d) | What is reservoir? | [1M] |
| | e) | What is the purpose of cement? | [1M] |
| | f) | Write about Rope Drives. | [1M] |
| | g) | Compare four stroke engines with two stroke engines. | [1M] |
| | h) | Why diesel engines have higher compression ratio compared to petrol engines? | [1M] |
| | i) | State the importance of power plants. | [1M] |
| | j) | Write a note on movements of Robots. | [1M] |

PART – B (60 Marks)

Basic Civil Engineering

UNIT-I

- | | | | |
|----|----|--|------|
| 2. | a) | Write about various grades of cement and its applications. | [5M] |
| | b) | Explain any two basic tests on cement. | [5M] |

(OR)

- | | | | |
|---|----|---|------|
| 3 | a) | Explain any two basic tests on aggregates. | [5M] |
| | b) | Write few types of cement and its applications. | [5M] |

UNIT-II

- | | | | |
|----|----|--|------|
| 4. | a) | Explain step by step procedure of locating contours. | [5M] |
| | b) | Explain about measurement of Angles. | [5M] |

(OR)

- | | | | |
|----|----|---|------|
| 5. | a) | What are the accessories for a chain survey? Explain the functions of each. | [5M] |
| | b) | What is different between magnetic bearing and true bearing? | [5M] |

UNIT-III

- | | | | |
|----|----|------------------------------------|------|
| 6. | a) | Write the purpose of reservoirs. | [5M] |
| | b) | Explain about Railway Engineering. | [5M] |

(OR)



7. a) How Transportation engineering is important in economic development? Discuss. [5M]
b) Write a note on Hydrology and its ways of structuring. [5M]

Basic Mechanical Engineering

UNIT-I

8. a) What is mechanical engineering? Explain the role of mechanical engineering in industries. [5M]
b) Define smart materials. List the properties and applications of smart materials. [5M]

(OR)

9. a) Define ferrous and Nonferrous material with examples. [5M]
b) Define a composite material. How are composite materials classified? Give example for each. [5M]

UNIT-II

10. a) Define CNC? Explain the important features of CNC machines. [5M]
b) Write short note on 3D printing. [5M]

(OR)

11. a) Derive an expression to find the efficiency of an Otto cycle. [5M]
b) Define one ton of refrigeration. Explain the properties of ideal refrigerants. [5M]

UNIT-III

12. a) Draw general layout of Hydro-Electric Power plant showing all components. [5M]
b) Write short note on Gear drives and its applications. [5M]

(OR)

13. a) Justify the statement: Actuators are the muscles of robots. [5M]
b) Briefly explain the need for robots in industries. [5M]

