

Reg No : Name :



MAR ATHANASIUS COLLEGE OF ENGINEERING, KOTHAMANGALAM

(Govt. Aided Autonomous Institution)

Second Semester B.Tech. Degree Examination, May, 2026

Course Code: B24ES1T05A

Course Name: BASIC CIVIL AND MECHANICAL ENGINEERING (A)

Max. Marks: 100

Duration:3 Hours

Instruction: Answer PART – I and PART – II in separate answer book

PART - I : Basic Civil Engineering (50Marks)

PART - A: 20 Marks (5 Qns x 4 Marks)

Answer all questions

1. Describe about any two instruments used in surveying.
2. Explain the importance of energy systems in green buildings.
3. Define the concept of idealization in mechanics. How is it applied in analyzing structures?
4. Explain why sand is essential in cement concrete.
5. Define Plinth Area and its significance in building construction as per Kerala Municipal Building Rules.

PART - B: 30 Marks (3 Qns x 10 Marks)

Answer any One full question from each module

Module 1

6. Enlist the major disciplines of Civil Engineering and explain how they are interconnected in the execution of large-scale infrastructure projects.

OR

7. Describe the steps involved in an effective solid waste management in a community.

Module 2

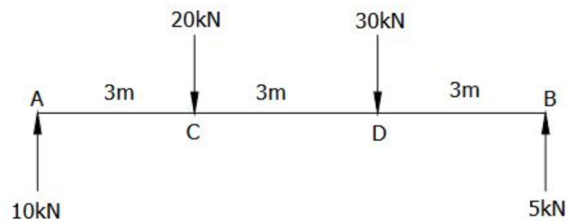
8. How do green buildings incorporate sustainable practices in terms of materials, energy systems, water management and overall environmental considerations?

OR

9. Enumerate the key provisions of the National Building Code (NBC) and explain their significance.

Module 3

10. Calculate the moment of the force system shown in the figure using Varignon's principle.



OR

11. Four concurrent forces of 30 N, 40 N, 50 N, and 60 N act at point O. The angles between successive forces are 45° , 60° , and 90° . Calculate the resultant using analytical methods.

PART - II: Basic Mechanical Engineering (50Marks)

PART - A: 20 Marks (5 Qns x 4 Marks)

Answer all questions

1. Discuss the major classification of pump.
2. What are the factors affecting belt slip in a drive system ?
3. What is a centralized air conditioning system, and how does it work?
4. What is priming? Why is it required in a centrifugal pump?
5. What is a combined cycle power plant? How does it improve efficiency compared to a conventional power plant?

PART - B: 30 Marks (3 Qns x 10 Marks)

Answer any One full question from each module

Module 4

6. What are the different types of cooling techniques in IC engine?

OR

7. Explain the structure and working of four-stroke petrol engine with a neat sketch.

Module 5

8. Explain different types of gear drives with neat sketches.

OR

9. Explain the working of a hoisting machine and its significance in material handling.

Module 6

10. Explain the general layout of a steam power plant, highlighting the role of major components.

OR

11. Describe the working principle of solar air conditioners. Discuss the benefits and challenges of using solar air-conditioning systems.
