RAJAGIRI SCHOOL OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)
FIRST SEMESTER B.TECH DEGREE EXAMINATION, APRIL 2021

100908/CO900D BASICS OF CIVIL AND MECHANICAL ENGINEERING

Max. Marks: 100   **Duration: 3 hours**

(There are two Sections. Section 1 and Section 2 are to be answered in two separate answer books)

SECTION 1 Basic Civil Engineering
(Max. Marks: 50)
PART A
(Answer **all** questions, **each** question carries 4 marks)

1. Explain relevance of Civil engineering in the overall infrastructural development of the country.

2. Explain FAR.

3. Suggest a suitable type of concrete applicable in marine conditions. Give reason.

4. Compare load bearing and framed structures.

5. Define bearing capacity of soil.

PART B
(Answer **one full** question from each module, each question carries **10** marks)

Module - 1

6.(a)   Describe the different zones of CRZ with reference to its limits   (6 marks)

  (b)   Discuss the important components of a building   (4 marks)

7.(a)   Identify the role of NBC, KBR & CRZ norms in building rules and regulations

        prevailing in our country.   (6 marks)

(b) Discuss the major disciplines of civil engineering and explain their role in the infrastructural framework. (4 marks)

Module -2

8.(a) Explain any three different kinds of cement available with reference to their properties. (6 marks)

(b) List the properties of good building bricks. Explain efflorescence in bricks. (4 marks)

9.(a) Explain any five modern construction materials used for construction. (6 marks)

(b) What are the principles of surveying (4 marks)

Module -3

10.(a) Compare English bond and Flemish bond (4 marks)

(b) Explain the energy systems and water management in Green buildings. (6 marks)

11.(a) Distinguish between shallow foundation and deep foundation (4 marks)

(b) Discuss the civil engineering aspect of MEP and HVAC in a commercial building (6 marks)

SECTION 2 Basic Mechanical Engineering

(Max. Marks: 50)

PART A

(Answer **all** questions, **each** question carries 4 marks)

1. Sketch the P-v and T-s diagram of a Carnot cycle and List the processes.
2. Illustrate the working of an epicyclic gear train.
3. Explain cooling and dehumidification processes.
4. Differentiate between soldering and brazing.
5. Explain the principle of Additive manufacturing

Part B

(Answer **one full** question from each module, each question carries **10** marks)

MODULE I

6. In an air standard Otto cycle the compression ratio is 7 and compression begins at 35ºC, 0.1MPa. The maximum temperature of the cycle is 1100ºC. Find
   i) Heat supplied per kg of air,
   ii) Work done per kg of air,
   iii) Cycle efficiency
   Take $C_p = 1.005$ kJ/kgK and $C_v = 0.718$ kJ/kgK

OR

7. a) Explain the working of a 4 stroke SI engine with neat sketches.   (7 marks)
   b) Explain the fuel system of a petrol engine.   (3 marks)

MODULE II

8. a) Explain the working of a vapour compression system with help of a block diagram   (7 marks)

   b) Define: Specific humidity, relative humidity and dew point temperature   (3 marks)

OR

9.   With the help of a neat sketch, explain the working of a centrifugal pump.

MODULE III

10.   Explain the two high, three high, four high and cluster rolling mills with neat sketches

OR

11.   a) Describe the arc welding process with a neat sketch.   (6 marks)
      b) Differentiate between up-milling and down-milling operations.   (4 marks)