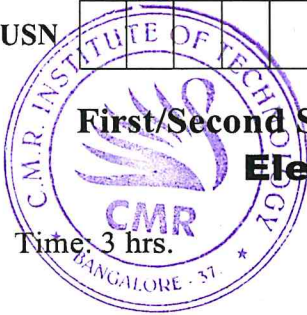


# CBCS SCHEME

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15EME14/24



## First/Second Semester B.E. Degree Examination, July/August 2021 Elements of Mechanical Engineering

Time: 3 hrs.

Max. Marks: 80

*Note: Answer any FIVE full questions.*

- 1 a. Compare the renewable and non-renewable energy sources. (08 Marks)  
b. Define fuel and give various classification of fuel. Also define calorific value of fuel with units. (08 Marks)
- 2 a. With a neat labelled sketch, explain the working of Babcock and Wilcox boiler. (10 Marks)  
b. Explain the principle of working of wind mill. (06 Marks)
- 3 a. Explain the working principle of closed cycle gas turbine with line diagram. (08 Marks)  
b. With a neat sketch, explain the working of Pelton Wheel. (08 Marks)
- 4 a. With the help of neat sketch, explain working of four stroke diesel engine. Also draw P-V diagram. (08 Marks)  
b. The following observations were made during a test on a two-stroke diesel engine:  
Bore diameter = 200 mm  
Length of stroke = 250 mm  
Speed = 350 rpm  
Brake drum diameter = 1.2 m  
Net brake load = 450 N  
Mean effective pressure = 2.8 bar  
Oil consumption = 3.6 kg/hr  
Calorific value of fuel = 42 MJ/kg  
Determine:  
(i) BP  
(ii) IP  
(iii) FP  
(iv) Mechanical efficiency  
(v) Brake thermal efficiency (08 Marks)
- 5 a. List various operations that can be performed on a lathe. Explain anyone with a sketch. (10 Marks)  
b. Explain the following operations with the help of sketch:  
(i) Counter boring  
(ii) Slot milling  
(iii) Tapping (06 Marks)
- 6 a. What is automation? With a block diagram, explain basic components of NC system. (08 Marks)  
b. Define Robot. Give the classification based on robot physical configuration. List the applications of industrial robot. (08 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and/or equations written eg, 42+8 = 50, will be treated as malpractice.

- 7 a. Write a short note on compositior. (08 Marks)  
b. What are ferrous metals? Write down applications of ferrous metals. (08 Marks)
- 8 a. With the help of suitable sketch, explain Oxy-acetylene welding process. (08 Marks)  
b. Compare welding, soldering and Brazing process. (08 Marks)
- 9 a. With the help of neat sketch, explain the principle and working of vapour absorption refrigeration system. (08 Marks)  
b. What are the commonly used refrigerants? List the desirable properties of a good refrigerant. (08 Marks)
- 10 a. Explain the following terms:  
(i) Unit of refrigeration  
(ii) Relative COP  
(iii) Ton of refrigeration  
(iv) Refrigerating effect (08 Marks)
- b. Define air-conditioning. With the help of a sketch, explain the working principle of room air conditioner. (08 Marks)

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