

# GBCS 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)



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- 7 a. Write a short note on compositor. (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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