

**Central Institute of technology Kokrajhar**  
(Deemed to be University)

**M. Tech. End Semester Examination 2025**  
Energy Auditing and Management (MGE201)

Time: 3 Hr.

Full Marks: 100

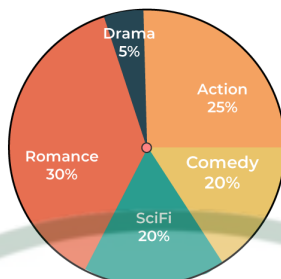
Symbols have their usual significance

Answer **any five** questions.

- 1 a) Write the correct answer only for the following questions: 1x5 = 5
- (i) The global primary energy consumption is the highest for the country  
a) India b) USA c) China d) Russia 1
- (ii) At present, approximately the energy distribution ration between developed and developing Countries is  
a) 50 : 50 b) 60 : 40 c) 70 : 30 d) 80 : 20 1
- (iii) Non contact speed measurements can be carried out by  
(a) Tachometer (b) Stroboscope (c) Oscilloscope (d) Odometer 1
- (iv) Which of the following source is not the non-conventional source of energy?  
a) Wind energy b) Bio-energy c) Hydro power d) Fire wood 1
- v) Non contact flow measurement can be carried out by  
(a) Orifice meter (b) Turbine flow meter (c) Ultrasonic flow meter (d) Magnetic flow meter 1
- vi) Lux meters are used to measure 1  
(a) Age of the industries (b) running status of the industries (c) illuminations (d) profit of the industries
- b) What are roles of the energy audit instruments? Mention six (6) energy audit instruments. 8
- c) State the importance of energy policy for industries. 6
- 2 a) Define – Energy performance, Energy efficiency and Energy optimization. 6  
b) Explain, with an example, how energy efficiency can be calculated. 5  
c) Discuss the importance and benefits of energy optimization. 4  
d) Explain the different steps to implement the energy optimization in a manufacturing unit or building system. 5
- 3 a) What is system efficiency? Give one example. 4  
b) Explain the different types of system efficiencies. 6  
c) Discuss about the methods for calculating system efficiency. 10
- 4 a) Define – Energy management and Energy audit. 6  
b) Discuss the objectives and importance of energy management and audit. 7  
c) Discuss the different phases of detailed energy audit methodology. 7
- 5 a) Explain, with an example, how a pie chart is used for data analysis. 6  
In a survey done among 300 people, it was observed which type of genre each person prefers.

The pie chart of the same is mentioned below. Analyze and interpret the pie chart accordingly to find the original data.

10



b) What is Sankey diagram? How Sankey diagram is useful for energy analysis?

10

6 a) What are the different steps of CUSUM technique?

10

b) Explain how a CUSUM chart is drawn for the following plant data:

10

Month	1	2	3	4	5	6
$E_{act}$ – monthly energy use (# toe/month)	340	340	380	370	300	400
P – monthly production (tones/month)	380	440	460	520	320	520

# toe –tonnes of oil equivalent

7 Write a short note on the following (any two):

2x10 =

- Building energy management
- Responsibilities of energy managers and auditors
- Energy Conservation and Management in FACT
- Material and energy balance

20