

It doesn't matter how much you write, the fact is how much right you are

Energy and Power:

1. What is Energy? Define energy from engineering perspectives.
2. Briefly describe all the forms of energy.
3. Chemical energy has only stored form – do you agree with the statement? Why?
4. What are the sources of indirect renewable Energy. Describe them.
5. Write short notes on conventional sources of energy.
6. Write down the four grades of coals and discuss about them briefly.
7. Draw the schematic diagram for power production from IC engines, Gas turbine, water turbine, wind turbine, nuclear power plant and electric motor.

Internal combustion Engines:

1. What is the main difference between engines and machines?
2. Briefly describe all the four strokes of an IC Engine.
3. With clear sketches show the Bore, Stroke, TDC, BDC, clearance volume, engine volume and write down the expressions of compression ratio and CC along with their definition.
4. Draw the ideal and actual valve timing diagram (VVT) of an IC engine.
5. What is valve overlap? How does it affect the pollution from an engine.
6. A car at higher speed causes less pollution and consumes less fuel- do you agree with the statement? Why, explain.
7. Draw the pressure Vs crank angle diagram for a single cylinder four stroke IC engine and mention its disadvantages.
8. Why multi cylinder engines are used? Describe briefly.
9. What is the purpose of using flywheel?
10. Describe the working principle of 2 stroke engine and describe why it causes more air pollution than 4 stroke engines.
11. 2 stroke engines need smaller flywheel – do you agree the statement? Why?
12. Write down the working principle of a diesel engine.
13. What are the difference between SI and CI engine.
14. Draw the P—v diagram (indicator diagram) for both SI and CI engine. Describe why CI engines are used at higher compression ratio.
15. Draw the indicator diagram for Diesel engine. Why this types of engines are used?
16. Write short notes on Wankel engine. Why these engines are used? Mention its advantages and disadvantages.
17. Draw the sketches of water cooling system, Air intake system, fuel supply system, exhaust system, starting system, lubrication system, ignition system for SI and CI engines (if needed).

18. Draw the power stages of a IC engine. Define Thermal efficiency, mechanical efficiency, and overall efficiency.
19. Define Mean Effective pressure (MEP). Prove that $IP = MEP \cdot N \cdot A \cdot S \cdot n$

Boiler and steam turbine:

1. What is the main purpose of a boiler? How does it differ from a kettle?
2. Make a comparison between a water tube and a fire tube boiler.
3. A boiler is labeled as “15 tube 4 (shell) pass boiler”, what information can you gather from the labeling?
4. Briefly discuss about the main body parts, mountings and accessories of a boiler. Why this components are used.
5. Name 7 boiler mountings and 6 boiler accessories and briefly discuss all the mountings.

Practice all the mathematical problems in the class lectures. Practice them carefully and frequently.