



Subject Name: Thermal Engineering-I

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Year and Sem, Department: III/I, Mechanical Engineering.

Unit-I: INTERNAL COMBUSTION ENGINES

Important points / Definitions:

1. Components of engines
2. Otto cycle engines
3. Diesel cycle engines
4. Comparison between petrol and diesel engines
5. Difference between 4-stroke and 2-stroke engines
6. Types of carburetors
7. Air fuel mixture in CI engines
8. Types of ignition systems
9. Function of spark plug
10. Engine lubrication systems

Short Questions (minimum 10 previous JNTUH Questions – Year to be mentioned)

1. Define function of carburetor?
2. Define function of fuel injector?
3. Define ignition system?
4. Function of fuel pump?
5. Define lubrication system?
6. What are the antifreeze solutions?
7. Draw the PV and TS diagrams of otto cycle and diesel cycle?
8. Advantages of carburetion systems?
9. Advantages of fuel injection systems?
10. Define spark plug and its function?

Long Questions (minimum 10 previous JNTUH Questions – Year to be mentioned)

1. Difference between 2-stroke and 4-stroke engines?
2. Explain the 4-stroke CI engine?
3. Difference between petrol and diesel engines?
4. Explain battery ignition system?
5. Explain the thermosyphon system?
6. Explain zenith carburetor and carter carburetor?
7. Explain the CDI electronic ignition system?
8. Explain the 2-stroke SI engine?
9. Explain dry-sump lubrication system?
10. Explain the valve timing diagram of a 4-stroke engine?



Unit-II: COMBUSTION AND COMBUSTION CHAMBERS

Important points / Definitions:

11. Normal combustion in SI engines
12. Flame propagation
13. Abnormal combustion
14. Detonation in SI engine
15. Types of combustion chambers
16. Knocking
17. Swirl and squish in diesel engines
18. DI combustion chamber
19. IDI combustion chambers
20. Stages of combustion in CI engines

Short Questions (minimum 10 previous JNTUH Questions – Year to be mentioned)

11. What is normal combustion?
12. What is abnormal combustion?
13. Define detonation?
14. What is effect of detonation?
15. What is knocking?
16. Factors effecting the ignition delay period?
17. Define swirl?
18. Define squish?
19. Types of combustion chambers in SI engines?
20. What is mean by ignition delay period?

Long Questions (minimum 10 previous JNTUH Questions – Year to be mentioned)

11. Explain the normal combustion in SI engines?
12. Explain the combustion in CI engine?
13. Stages of combustion in CI engines?
14. Explain the time factor for SI engines?
15. Explain the effect of detonation?
16. Explain the effect of engines variables on flame propagation?
17. Explain the types of combustion chambers for SI engines?
18. Explain the stages of combustion in CI engines?
19. Explain the factors effecting the ignition delay period?
20. Difference between abnormal combustion in SI and CI engines.

Unit-III: TESTING AND PERFORMANCE OF IC ENGINES, RECIPROCATING AIR COMPRESSOR

Important points / Definitions:

21. Indicated power
22. Measurement of brake power and friction power
23. Fuel consumption
24. Air consumption
25. Air fuel ratio
26. Efficiencies of IC engines



27. Heat balance sheet
28. Engine performance curves
29. Engine emission
30. Uses of compressed air
31. Classification of compressors

Short Questions (minimum 10 previous JNTUH Questions – Year to be mentioned)

21. Define indicated power and brake power?
22. Define rope brake dynamometer?
23. Define mean effective pressure and brake specific fuel consumption?
24. What is heat balanced sheet?
25. Define air fuel ratio?
26. Define air compressor? Explain reciprocating air compressor?
27. Draw the PV and TS diagrams of air compressors?
28. What is multistage compression?
29. Define isothermal, volumetric and mechanical efficiencies?
30. Define air receiver, air driers and moisture drain traps?

Long Questions (minimum 10 previous JNTUH Questions – Year to be mentioned)

1. A full-load test was conducted on a two-stroke engine and following results were obtained
:
Speed=500rpm, brake load =500N, IMEP=3bar, oil consumption =5kg per hour,
Jacket water flowrate =7kg/min,jacket water temp raise 35C,A/F RATIO=30,exhaust gas
temp=350c, room temp=25c,atmospheric pressure=1bar,cylinder
diameter=22cm,stroke=28cm,brake dia=1.6m,cv of fuel=42000KJ/kg,proportion of
H₂=15%,specific heat of exhaust gas=1KJ/Kg.K ,specific heat of dry steam=2KJ/Kg.K
CALCULATE
A.indicated thermawl efficiency
B.specific fuel consumption
C.volumetric effeciorncy based on atmospheric conditions.
Draw a heat balance sheet for test?
- 2.Explain the working of single acting air compressor?
- 3.A four cylinder four stroke petrol engine has a bore of 80mm and a stroke of 80mm.the
compression ratio is 8.calculate the cubic capacity of the engine and clearance volume of each
cylinder what type of engine is this?
- 4.Explain the construction of reciprocating air compressor?
- 5.Explaihn the types of air systems?
- 6.Derive an expression for indicated work for a single acting compressor with out clearance?
7. Derive an expression for indicated work for a single acting compressor with clearance?
- 8.Explain rope brake dynamometer?



9.Explain hydraulic dynamometer?

10.Explain morse test?