

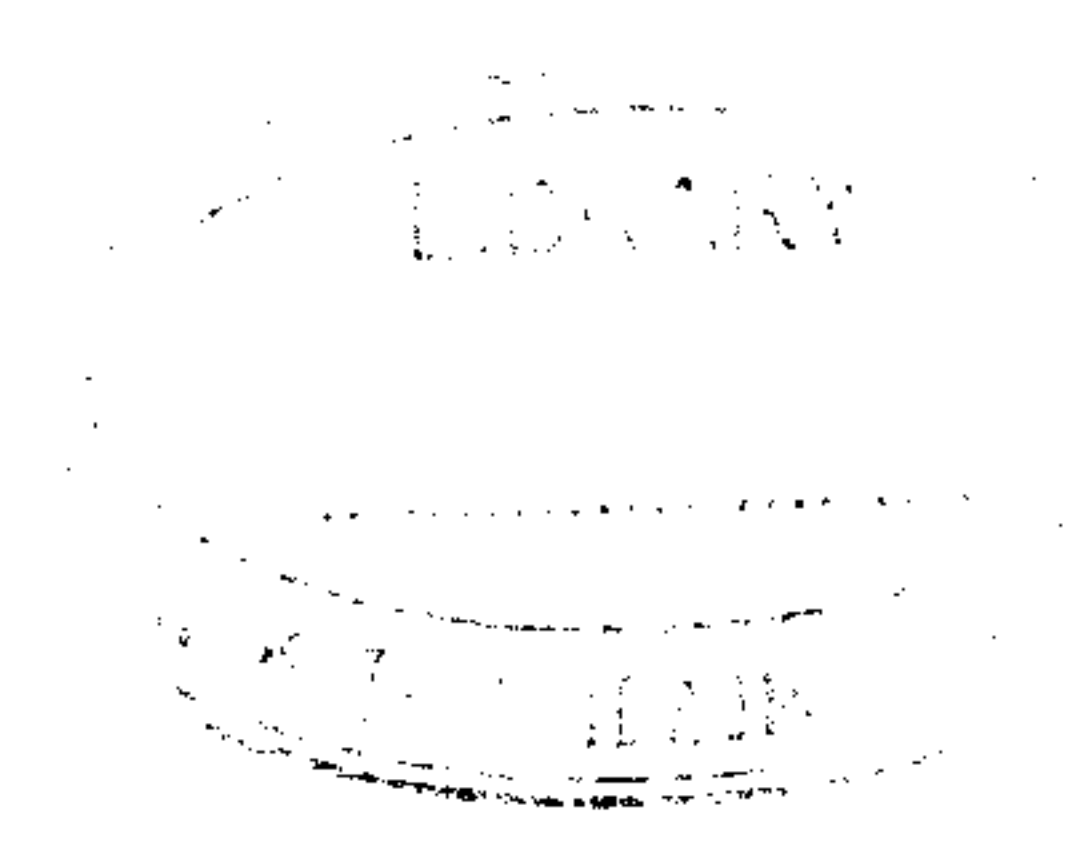


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B – 2599

Reg. No. :

Name :



**Eighth Semester B.Tech. Degree Examination, December 2016
(2008 Scheme)
08.806.16 : DESIGN OF IC ENGINES (MPU)**

Time : 3 Hours

Max. Marks : 100

PART – A

Answer **all** question from Part **A**.

(10×4=40 Marks)

1. What is the simplest way by which an IC engine cycle can be analyzed ? Do IC engines operate on a thermodynamic cycle ?
2. What is the use of air standard cycle analysis ?
3. Mention the various assumption made in air standard cycle analysis.
4. What is Carnot cycle and what is its importance ? How is this cycle reversible ?
5. Define the following :
 - i) Charging efficiency
 - ii) Pressure loss coefficient
 - iii) Excess air factor
 - iv) Index of compression.
6. What are the advantages and disadvantages of a two stroke engine ? Compare two stroke SI and CI engine.
7. What are the methods control the crown thickness ?
8. What are the advantages of Poppet valve ?
9. What is the material used for cylinder head ? Why ?
10. What are the function of piston coatings ?

P.T.O.



PART – B

Answer **one** question from **each** Module.

(20×3=60 Marks)

Module – I

11. a) A four stroke engine delivers a brake power of 441.6 kW with a mechanical efficiency of 85 percent. The measured fuel consumption is 160 kg of fuel in one hour and air consumption is 410 kg during one sixth of an hour. The heating value of the fuel is 42000 kJ/kg. Calculate :
- Indicated power
 - Frictional power
 - Air-fuel ratio
 - Indicated thermal efficiency
 - Brake thermal efficiency.
- b) A two stroke cycle CI engine delivers a brake power of 368 kW while 73.6 kW is used to overcome the friction losses. It consumes 180 kg/h of fuel at an air fuel ratio of 20 : 1. The heating value of the fuel is 42000 kJ/kg. Calculate :
- Indicated power
 - Mechanical efficiency
 - Air consumption
 - Indicated thermal efficiency.
 - Brake thermal efficiency.

OR

12. a) What will be the effect on the efficiency of an Otto cycle having a compression ratio of 8, if C_v increased by 1.6%.
- b) Briefly explain the following :
- Time loss factor
 - Heat loss factor
 - Exhaust blow down factor.



Module – II

13. Compare the various scavenging methods.

OR

14. An opposed piston engine 8 by (10 + 10) 720 rpm inlet duration is 102° , inlet port height is 1.5 inches. The engine permit the exhaust port with total width of 12.7 inches and 51% of circumference. Design exhaust port completely.

Module – III

15. a) List the types of exhaust temperature measurement.

b) Explain the internationally accepted methods of measuring the following invisible emission.

- i) Oxides of nitrogen
- ii) Carbon monoxide
- iii) Unburned hydrocarbon
- iv) Aldehydes.

OR

16. Design a plain carbon steel crank shaft for a 0.4×0.6 m single acting 4S single cylinder engine to operate at 200 rpm. The mean effective pressure 0.49 MPa. The maximum combustion pressure is 2.625 MPa. the maximum torsional moment when the crank angle is 36° , the gas pressure is 0.975 MPa. The ratio of connecting rod length to crank radius is 4.8. The fly wheel is used as pulley. The weight of the flywheel is 54.5 kN. The total weight of belt pulley is 6.75 kN. Assume suitable design data.

