

**337653(37)**

**B. E. (Sixth Semester) Examination, April-May 2020**

**(New Scheme)**

**(Mechanical Engg. Branch)**

**INTERNAL COMBUSTION ENGINES**

***Time Allowed : Three hours***

***Maximum Marks : 80***

***Minimum Pass Marks : 28***

***Note : Attempt all questions. Part (a) of each question is compulsory. Attempt any two parts from (b), (c) & (d).***

**Unit - I**

1. (a) Draw the suitable sketches of following type of cylinder arrangements : 2
  - (i) Opposed piston engine
  - (ii) Radial engine
- (b) Explain reasons of Ignition & Injection Advance?  
Draw the value timing for four stroke C.I. & S.I.

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- Engine with neat sketch. 7
- (c) Write the comparison between four stroke S.I. & C.I. Engine. 7
- (d) Explain pumping looploss & burning time loss with neat sketch. 7

**Unit - II**

- 2 (a) Define cetane number? 2
- (b) Write short notes on the following : 7
- (i) Carburettor Icing
- (ii) Crank case dilution
- (c) What is ASTM distillation curve? How it is obtained? 7
- (d) Define performance number & Dopes? Explain CCR, HUCR & vapour lock? 7

**Unit - III**

3. (a) Define carburetion. 2
- (b) What is meant by Idling? Explain why rich mixture is required for Idling. Describe with suitable sketch, idling system of modern carburetion. 7

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- (c) What is nozzle tip? Explain with a neat sketch the working of a simple carburetor? 7
- (d) What is the necessity of gasoline injection? Describe briefly the MPFI system with a neat sketch? 7

**Unit - IV**

4. (a) Define atomization? 2
- (b) Explain Bosch fuel injection pump with neat sketch? 7
- (c) Define Governing? Explain Quantity governing with neat sketch? 7
- (d) Explain magneto Ignition system with neat sketch. 7

**Unit - V**

5. (a) Define Brake Power & Indicated power? 2
- (b) Explain Willan's line method with neat sketch? 7
- (c) The following observing were recorded in a test of one hour duration on a single cylinder oil engine working on four-stroke cycle
- Bore = 300 mm, Stroke = 450 mm, fuel used = 8.8 kg, calorific value of fuel = 41800 kJ/kg, Average speed = 200 rpm m.e.p. = 5.8 bar, Brake

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friction load = 1860 N, Quantity of cooling water = 650 kg, Temp. rise = 22°C, Dia of brake wheel = 1.22 m, Calculate :

- (i) Mechanical efficiency
- (ii) Brake thermal efficiency

Draw the heat balance sheet also.

7

- (d) A single cylinder 4 stroke engine (diesel) gave the following results while running on full load :

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Area of indicator card = 300 mm<sup>2</sup>

Length of diagram = 40 mm,

Spring constant = 1 bar/mm

Speed of Engine = 400 r.p.m.,

Load on the brake = 370 N,

Spring balance reading = 50 N,

Dia of brake drum = 1.2 m,

Fuel consumption = 2.8 kg/h,

Calorific value of fuel = 41800 kJ/kg

Dia of cylinder = 160 mm,

Stroke of piston = 200 mm

Calculate :

- (i) Indicated mean effective pressure
- (ii) Brake power & Brake mean effective pressure
- (iii) Brake specific fuel consumption, brake thermal & Indicated thermal efficiencies.