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B. E. (Sixth Semester) Examination, Nov.-Dec. 2018

(New Scheme)

(Branch : Mech.)

INTERNAL COMBUSTION ENGINES

Time Allowed : Three hours

Maximum Marks : 100

Minimum Pass Marks : 40

Note *: Part (a) is compulsory from all units. Attempt any two parts from (b), (c) and (d) from all units. Assume suitable data if required.*

Unit - I

1. (a) What do you mean by ignition advance? 2

   (b) Compare S.I. and C.I. engines. 7

   (c) Draw the actual valve timing diagram for four

stroke C.I. engine? What do you mean by valve overlap? 7

   (d) What will be the effect on the efficiency of an otto cycle having a compression ratio of 7, if the specific heat at constant volume increases by 1%. 7

Unit - II

2. (a) Define Octane number. 2

   (b) Explain the stages of combustion in C.I. engine with the help of pressure crank angle $(P-\theta)$ diagram? 7

   (c) Write short notes on the following : 7

   (i) Carburettor icing

   (ii) Crankcase dilution

   (d) What do you mean by HUCR? Compare between knocking in S.I. and C.I. engines. 7

Unit - III

3. (a) Define carburettor depression. 2

   (b) Elaborate with the points the mixture requirements at different loads and speeds. 7

(c) Explain the following : 7

(i) Rich mixture

(ii) Lean mixture

(iii) Stoichiometric mixture

(iv) Factors affecting carburetion

(d) A simple jet carburettor has to supply 5 kg of air per minute. The air is at a pressure of 1·013 bar and at a temperature of 27°C. Calculate the throat diameter of the choke for air flow velocity of 90 m/s. Take velocity coefficient to be 0.8. Assume isentropic flow. Assume the flow to be compressible. 7

Unit - IV

4. (a) What are the function of Lubrication? 2

(b) Explain Bosch fuel injection pump with the help of neat sketch. 7

(c) Explain working of a battery ignition system with the help of neat sketch. Compare battery and magneto ignition system. 7

(d) What do you mean by governing of I.C. engines? Explain different types of governing system used in I.C. engines. 7

Unit - V

5. (a) List the performance parameters of I.C. engine. 2

(b) What are the different methods used to find the friction power of an engine? Explain Willan's line method. 7

(c) Sketch a typical variable speed test performance curve at full throttle of S.I. engine and discuss the nature of the curve. 7

(i) Power Vs. Engine speed

(ii) Fuel consumption vs. Engine speed

(d) A gasoline engine working on four stroke develops a brake power of 20·9 kW. A Morse test was conducted on this engine and the brake power (kW) obtained when each cylinder was made inoperative by short circuiting the spark plug are 14·9 kW, 14·3 Kw, 14·8 kW and 14·5 kW respectively. The test was conducted at constant speed. Find the indicated power, mechanical efficiency and brake mean effective pressure (b mep). When all cylinders are firing. The bore of the engine is 75 mm and the stroke is 90 mm. The engine is running at 3000 r.p.m. 7