

16/7/2016

4E4145

Roll No. _____

Total No of Pages: **3**

4E4145

B.Tech. IV-Sem (Main & Back) Exam; June-July 2016

Automobile Engineering

4AE6A I. C. Engines

AE, ME

Time: 3 Hours

Maximum Marks: 80

Min. Passing Marks (Main & Back): 26

Min. Passing Marks (Old Back): 24

Instructions to Candidates:-

Attempt any five questions, selecting one question from each unit. All Questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.

Units of quantities used/ calculated must be stated clearly.

Use of following supporting material is permitted during examination.

1. _____

2. _____

UNIT-I

Q.1 A Four Stroke petrol engine having following specifications No. of cylinder = 4, Bore = 110mm, stroke = 130mm, engine speed = 2250 r.p.m., brake power = 36kw, fuel consumption = 10.5kg/h, Air box orifice diameter = 75mm, $C_d=0.6$, C_v of fuel = 42,000 kJ/kg. [16]

During the performance test following data were observed: pressure drop across the orifice = 4.1cm of water, Atmospheric temperature = 15°C and pressure = 1.0135 bar.

Calculate:

- (a) Brake thermal efficiency
- (b) Brake mean effectual pressure
- (c) Volumetric efficiency.

OR

- Q.1 (a) Explain energy balance of I.C. engine. [8]
- (b) What are the main constituents of emission from S.I. engine? Write down the limits of emissions as per Indian standard. [4+4=8]

UNIT-II

- Q.2 Explain the combustion in S.I. engine. Draw P-Q diagram and explain three stage of combustion. [4+4+8=16]

OR

- Q.2 Explain the four stage of combustion in C.I engine and draw P-Q diagram for combustion. [12+4=16]

UNIT-III

- Q.3 (a) What are fuel requirement for following operating condition of S.I. engine: [4×3=12]
- (i) Idling and low load.
 - (ii) Cruising range.
 - (iii) Maximum power range
- (b) Explain working of mechanical fuel pump. [4]

OR

- Q.3 (a) Explain working of electronic ignition system. [8]
- (b) Explain the following:
- (i) Common rail injection system
 - (ii) Distributor injection system. [4×2=8]

UNIT-IV

- Q.4 (a) Why cooling system is required in I.C. engines? What are the effects of over cooling and under cooling? [4+4=8]
- (b) Explain different methods of supercharging in I.C. engines. [4×2=8]

OR

Q.4 (a) What are the various functions of lubrication in I.C. engines? Explain. How lubricating oils are rated?

[5+3=8]

(b) Explain pressurise wet sump lubrication system.

[8]

UNIT-V

Q.5 (a) Explain the construction and working of dual fuel engine cycle. Explain its merits and demerits as compare to conventional cycle.

[8+4=12]

(b) What are the applications of multifuel engines?

[4]

OR

Q.5 (a) Explain the followings:

(i) Free Piston Engine

(ii) Rotary Engine.

[8×2]