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B.TECH.
(SEM -FIFTH) THEORY EXAMINATION 2017-18
I C ENGINES & COMPRESSORS

Time: 3 Hours

Total Marks: 100

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt all questions in brief.

2 x 10 = 20

- What is degree of reaction?
- What is Motor Octane No And Research Octane No. ?
- Write On Swirl & Squish.
- Draw Actual P-V Diagram For Four Stroke Engine.
- What Is Equivalence Ratio?
- Compute Bmep Of Four Cylinder 2 Stroke Engine, 100 Mm Bore, 125 Mm Stroke When It Develops A Torque Of 490 Nm.
- By What Process Crude Oil Is Separated Into Gasoline , Kerosene And Fuel Oil?
- Why Additives Are Added In Lubricants?
- What Is Catalytic Converter?
- What Is Mean Effective Pressure?

SECTION B

2. Attempt any three of the following:

10 x 3 = 30

- Show That For Max Work/Kg Of Air In Otto Cycle For A Given Upper And Lower Temperature Of T_3 & T_1 The Temperature At The End Of Compression T_2 And The End Of Expansion T_4 Are Equal & Are Given By $T_2 = T_4 = (T_1 T_3)^{1/2}$
- What Are The Type Of Combustion Chamber Used In C.I Engines?
- Explain Ignition Lag In S.I Engine? Discuss The Effect Of Engine Variables On Ignition Lag.
- Compare The Otto And Diesel Cycle For Same Maximum Pressure And Heat Input & Same Compression Ratio And Heat Rejection.
- Prove That Mean Effective Pressure $= (\eta_m \times \Delta P) / (r-1)(\gamma-1)$

SECTION C

3. Attempt any one part of the following:

10 x 1 = 10

- What Do You Understand By Surging And Stalling In An Axial Flow Compressor?
- Explain The Working Of Thermos Syphon Cooling System With Neat Sketch.

4. Attempt any one part of the following:

10 x 1 = 10

- Discuss The Effect Of Gasoline Volatility On Cold Starting, Hot Starting, Warm Up And Vapour Lock. What Is The Performance Number And Diesel Index?
- Write Short Notes On –Root Blowers With Diagram , Exhaust Blow Down .

5. Attempt any one part of the following:

10 x 1 = 10

What Is Crankcase Ventilation & Its Type?

b) Explain Biogas Plant With Proper Diagram

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10 x 1 = 10

6. Attempt any *one* part of the following:

- a) Describe The Operation Of Any Two Types Of Modern Fuel Injection System With Sketch And Also Explain Working Of Pintle Nozzle And Pintaux Nozzle With Sketch.
- b) Prove That In Case Of Reciprocating Compressor The Condition For Minimum Work Per Kg Of Air Delivered By Its Two Stage With Inter-cooling Is Achieved When Intermediate Pressure Is Geometric Mean Of Suction Pressure And Final Delivery Pressure.

7. Attempt any *one* part of the following:

10 x 1 = 10

- a) Explain Willan's Line And Morse Test.
- b) Derive An Expression For Mean Effective Pressure For Diesel Cycle

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