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Printed Pages : 3 **TME – 602**

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 4094 Roll No. | | | | | | | | | | |

B. Tech.

(SEM. VI) EXAMINATION, 2006-07

I. C. ENGINE

Time : 3 Hours] *[Total Marks : 100*

Note : *Attempt **all** questions. All questions carry **equal** marks. Assume suitably, if any missing data.*

1 Answer any **four** of the following : **5×4=20**

(a) Make comparison between two stroke and four stroke engine.

(b) List the differences in the Air standard cycle and Actual cycle of IC engine.

(c) How are SI engine fuels rated?

(d) A six cylinder, four stroke, three litre capacity SI engine having compression ratio 9.5, develops 205 N-m torque at 3600 RPM. Find :

(i) Brake mean effective pressure

(ii) Cylinder Bore if bore is equal to stroke length.

(e) Discuss the suitability of alcohols as a fuel in IC engine.

(f) Discuss the importance of :

(i) Gum content

(ii) Sulphur content for diesel fuel.

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2 Answer any **two** of the following : **10×2=20**

(a) Discuss Battery ignition system with neat sketch. Also discuss the effect of Engine speed and part load operation on the ignition timing requirements.

(b) With the help of pressure-crank angle (P-θ) diagrm, explain the stages of conbustion in SI engine. How the flame propogation is affected by compression ratio, engine load and engine speed ?

(c) Write short notes on the following:

(i) Multi Point Fuel Injection (MPFI)

(ii) Types of combustion chamber for SI engine.

3 Answer any **two** of the following : **10×2=20**

(a) Discuss delay period in CI engine combustion. How do the fuel quality, engine load and injection advance angle affect the delay period ?

(b) State the requirements of an ideal injection system. Describe with the help of neat sketch common rail injection system.

(c) What are the major emissions that come out in diesel exhaust. How can NO_x emissions can be reduced by exhaust gas recirculation.

4 Answer any **two** of the following : **10×2=20**

(a) (i) What are the effects of supercharging on power output, fuel consumption and mechanical efficiency?

(ii) Define viscosity index and flash point of lubricating oil.

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(b) (i) Explain cranck case ventilation.
(ii) Make comparison between air and water cooling systems of Engine.

(c) (i) The air flow to a four cylinder four stroke petrol engine is measured by means of a 7.5 diameter orifice, $C_d = 0.6$. Following data were observed during a test Bore - 11 cm, stroke = 13 cm, pressure drop across the orifice = 4.1 cm of water, engine speed = 2250 rev/min. atmospheric temperature and pressure = 15°C and 1.013 bar. Find the volumetric efficiency.

(ii) Find the stoichiometric air fuel ratio for an engine operating on mixture of 80% gasoline (C_8H_{15}) and 20% methanol by mass.

5 Answer any **two** of the following : **10×2=20**

(a) A single acting two stage compressor with complete intercooling delivers 10 kg/min of air at 16 bar. The suction occurs at 1 bar and 15°C. Assume the index of compression and expression (n) = 1.25 and stroke = Bore, speed = 400 rpm. Calculate, (i) Power required, (ii) Heat transferred in intercooler (iii) Ratio of cylinder diameters.

(b) Make comparison between centrifugal and axial compressors. Also plot the performance characteristics of rotary compressors.

(c) Write short notes on any **two** of the folllowing :
(i) Singing and choking in compressor
(ii) Multistage compression
(iii) Roots blowers.
