Sanjay Ghodawat University, Kolhapur

2020-21

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EXM/P/09/00

Year and Program:TY.B Tech.	**School of Commerce and Management**	**Department: Mechanical**
Course Code: MET306	**Course Title: Internal Combustion Engines**	**Semester : VI**
Day and Date: Wednesday, 09-06-2021	**End Semester Examination**	**Time:2 Hrs. Max Marks:50**

Instructions: 1) All Questions are compulsory.

		Marks	Bloom's Level	CO
Q.1	**Answer/Solve the following (any Two)**–			
a)	With neat sketch explain how valve timing diagram of fours stroke engine helps to improve the performance of engine and define the concept of valve overlapping.	8	L1	306.1
b)	An engine fitted with a single jet carburetor having a jet diameter of 1.25 mm has a fuel consumption of 6 kg/h. The specific gravity of fuel is 0.7. the level of fuel in the float chamber is 5mm below the top of the jet when the engine is not running. ambient conditions are 1 bar and 17 ^{0}C. The fuel jet diameter is 0.6 mm. The discharge coeff. of air is 0.85. Air fuel ratio is 15. Determine the critical velocity of flow at throat and the diameter. Express the pressure at throat in mm of water column. Neglect compressibility effect.	8	L3	306.2
c)	A petrol engine has a carburetor of 32 mm venturi size. The jet diameter is 2 mm. The pressure differenceat throat is 50 mm of Hg. The atmospheric pressure is 1 bar and temperature 27 ^{0}C. The coefficient of discharge for venturi is 0.85 and for fuel jet 0.66. the density of petrol is 740 kg/m^3. Nozzle lip is zero. Relative density of Hg 13.6. Find the fuel velocity, fuel flow, air velocity and air flow.	8	L3	306.2
Q.2	**Answer/Solve the following (any two)** –			
a)	Discuss the effect of the following engine variables on flame propagation a) fuel air ratio b) engine load c) Compression ratio d) engine speed.	8	L2	306.3
b)	What are the basic requirements of good SI engine combustion chamber?	8	L3	306.3
c)	Explain the phenomenon of knock in CI engines and compare it with SI engine knock.	8	L3	306.3

Q.3 **Answer/Solve the following (any two) –**

a) During a trial on a four cylinder petrol engine runnig at 3000 rev./min the brake load was 267 N when all cylinders were working. When each cylinder was cut out in turn and the speed return to 3000 rev./min the brake readings were 178 N, 187 N and 182 N. For the brake, B.P $= \frac{WX(Rev./min)}{27300}$ where W is brake load in Newtons. Determine B.P, I.P and Mechanical eff. — 9 — L4 — 306.4

b) A four stroke gas engine has a cylinder diameter of 27 cm and piston stroke of 45cm. the effective diameter of the brake is 1.62 m. The observation made in a rest of the engine were as follows — 9 — L3 — 306.4

Duration of test	38 min 30sec
Total no. of revolution	8080
Total no. of explosions	3230
Net load on the brake	903 N
Mean effective pressure	5.64 bar
Gas used	7.7 m^3
Pressure of gas at meter	135 mm of H_2O above atm pres.
Temp. of gas	27 degree cel.
Height of barometer	750 mm of Hg
Calorific value of gas	18420 kJ/m^3 at NTP
Mass of jacket cooling water	183 kg
Rise in temp. of cooling water	47 degree cel.

Draw up heat balance sheet

c) Describe the concept of supercharging with neat sketch. Which of the two engine, SI and CI is inherently more suitable for supercharging? Why? — 9 — L3 — 306.5

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