Roll No. ☐☐☐☐☐☐☐☐☐☐☐☐☐   Total No. of Pages : 02

Total No. of Questions : 18

B.Tech.(AE) (2012 to 2017)   (Sem.–3)
# INTERNAL COMBUSTION ENGINES
Subject Code : BTAE-303/401
M.Code : 72204

Time : 3 Hrs.   Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :
 1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
 2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
 3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

Answer briefly :

1.   What is a square engine?

2.   Define cetane number.

3.   Draw the p-v diagram for dual cycle?

4.   Name any two methods of petrol engine fuel supply systems.

5.   Why additives are used. Name any two additives used in lubricant.

6.   What is spark retardation?

7.   Explain viscosity rating.

8.   Differentiate between air and water cooling systems.

9.   List limitations of turbocharging.

10.   Define volumetric efficiency.

SECTION-B

11. Briefly explain the classification of two stroke engines based on scavenging processes giving neat sketches for each engine.

12. Discuss the process of combustion in CI engines clearly bringing out the importance of delay period.

13. Sketch any fuel injector system used for diesel engine and explain its working.

14. Following data refers to the simple carburetor. da = 0.08m, Cda = 0.94, df = 0.005m, Cdf = 0.7. If the pressure drop amount is 0.14 bar then, find out air-fuel ratio when (a) Nozzle lip is neglected and (b) nozzle lip is 0.5 cm. Assume density of fuel and air are 780 kg/m^3 and 1.293 kg/m^3 respectively.

15. Explain the forced circulation cooling system giving neat sketch.

SECTION-C

16. In S.I engine working on the ideal Otto cycle, the compression ratio is 5.5. The pressure and temperature at the beginning of compression are 1 bar and 27°C respectively. The peak pressure is 30 bar. Determine the pressure and temperatures at the salient points, the air standard efficiency and the mean effective pressure. Assume ratio of specific heat to be 1.4 for air.

17. Discuss various methods of cooling internal combustion engine giving merits and demerits of each.

18. What do you understand by term turbo-charging? How is turbo-charging different from supercharging? Explain with a neat sketch the principle of exhaust turbo- charging of a single cylinder engine.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.