

**DIPLOMA – VIEP – MECHANICAL
ENGINEERING (DMEVI)**

Term-End Examination

December, 2014

01165

BIMEE-031 : I.C. ENGINES

Time : 2 hours

Maximum Marks : 70

Note : Answer any *seven* questions. All questions carry equal marks. Assume missing data, if any.

1. (a) Explain the working of a single cylinder 4-stroke spark ignition (SI) engine, with the help of suitable sketches. 5
- (b) A certain engine produces 10 kW indicated power. Its mechanical efficiency is 80%. Calculate the brake power and the friction power. 5
2. (a) Compare the relative advantages and disadvantages of CI engines over SI engines. 5
- (b) Explain the valve timing diagram of a 4-stroke CI engine. 5

3. Define and explain the delay period in CI engines. Discuss the effect of the following variables on delay period in CI engines : 10
- (a) Injection pressure
 - (b) Fuel quality
 - (c) Injection angle
 - (d) Compression ratio
4. Explain the following types of injection systems in CI engines, with the help of suitable sketches : 10
- (a) Jerk pump system
 - (b) Common rail system
5. Explain the working of Solex Carburettor, with the help of neat sketches. 10
6. (a) How are CI engine combustion chambers classified ? Explain the term 'Swirl' in CI engines and 'Turbulence' in SI engines. 5
- (b) Discuss the advantages and disadvantages of induction swirl. 5
7. Why is cooling of internal combustion engine necessary ? With the help of neat sketches, describe the construction and working of a thermostat. What are the advantages of using thermostat cooling in the cooling system ? 10

8. (a) Sketch a typical variable speed test performance curves of an SI engine and comment on the nature of the curves. 5
- (b) Explain how power output and Brake Specific Fuel Consumption (BSFC) varies with air-fuel ratio in SI engines. 5
9. (a) What are the reasons of hydrocarbon emissions from the tail pipe of a gasoline engine? 5
- (b) What are the BS-IV norms for gasoline operated passenger cars? 5
10. Write short notes on any *two* of the following : $2 \times 5 = 10$
- (a) Heat balance sheet of diesel engine
- (b) Rotary engine
- (c) Ignition system in SI engines
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