

Reg. No.

|  |  |  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|--|--|
|  |  |  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|--|--|

**B.E. / B.TECH. DEGREE EXAMINATIONS, DEC 2019**

Third Semester

**AE18301 – AUTOMOTIVE ENGINES***(Automobile Engineering)***(Regulation 2018)****Time: Three Hours****Maximum : 100 Marks**

Answer ALL questions

**PART A - (10 X 2 = 20 Marks)**

|  | CO | RBT |
|--|----|-----|
| 1. Define Clearance Volume   | 1  | R   |
| 2. What is firing order? Why it is required?                         | 1  | U   |
| 3. What is the difference between air injection and solid injection? | 2  | R   |
| 4. What are the advantages of electronic fuel injection system?      | 2  | R   |
| 5. Why swirl is important in engines?                                | 3  | U   |
| 6. Compare Knock in SI and CI engines.                               | 3  | U   |
| 7. Compare supercharging and turbo charging in engines.              | 4  | U   |
| 8. What is indicated thermal efficiency?                             | 4  | R   |
| 9. Why fins and baffles are required in an air-cooled engine?        | 5  | U   |
| 10. What are the properties of lubricating oil in engines?           | 5  | R   |

**PART B - (5 X16 = 80 Marks)**

11. (a) (i) With a neat sketch explain the working principle of four stroke spark ignition engine. (8) 1 U
- (ii) Compare SI and CI engines with respect to basic cycle. (8) 1 U
- (OR)**
- (b) In a SI 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 the ratio of specific heats to be 1.4 for air. (16) 1 AP
12. (a) With a neat sketch, explain the working of simple fixed venturi carburettor. (16) 2 U
- (OR)**
- (b) Explain the construction and working of common rail diesel injection system with neat sketches. (16) 2 U

13. (a) Bring out clearly the process of combustion in CI engines and also explain the various stages of combustion. (16) 3 U
- (OR)**
- (b) (i) Discuss the types of combustion chambers used in IC engines. (8) 3 U  
(ii) What are the general principles of SI engine chamber design? (8) 3 U
14. (a) (i) Briefly explain the working of Centrifugal supercharger and Roots supercharger. (8) 4 U  
(ii) Explain with a neat sketch the principle of exhaust turbo charging of a single-cylinder engine. (8) 4 U
- (OR)**
- (b) (i) Describe how the IP of a multi cylinder engine is measured. (8) 4 U  
(ii) Describe with suitable sketch, the working of brake rope dynamometer. (8) 4 U
15. (a) Briefly explain the need for engine cooling system. Mention the limitation of the thermosyphon system. (16) 5 U
- (OR)**
- (b) Explain the pressure feed and wet sump lubricating system with neat sketches. (16) 5 U