

B.E DEGREE EXAMINATIONS: NOV/DEC 2014

(Regulation 2009)

Fourth Semester

AUTOMOBILE ENGINEERING

AUE106: Automotive Engines

Time: Three Hours

Maximum Marks: 100

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. In a four stroke cycle, the minimum temperature inside the engine cylinder occurs at the
 - a) beginning of suction stroke
 - b) end of suction stroke
 - c) beginning of exhaust stroke
 - d) end of exhaust stroke
2. The thermal efficiency of a standard Otto cycle for a compression ratio of 5.5 will be
 - a) 25%
 - b) 50%
 - c) 70%
 - d) 90%
3. In a diesel engine, the duration between the time of injection and ignition, is known as
 - a) pre-ignition period
 - b) delay period
 - c) burning period
 - d) period of ignition
4. The pressure and temperature at the end of compression stroke in petrol engine in the order of
 - a) 4-6 kg/cm² and 200-250⁰ C
 - b) 6-12 kg/cm² and 250-350⁰ C
 - c) 12-15 kg/cm² and 400-450⁰ C
 - d) 16-18 kg/cm² and around 500⁰ C
5. Combustion in compression ignition engines are
 - a) homogeneous
 - b) laminar
 - c) urbulent
 - d) heterogeneous
6. The specific fuel consumption per BHP hour for diesel engine is approximately
 - a) 0.2 kg
 - b) 0.25 kg
 - c) 0.3 kg
 - d) 0.4 kg

7. Scavenging air in diesel engine means
- | | |
|--|--|
| a) forced air for cooling cylinder | b) air used for combustion sent under pressure |
| c) burnt air contains products of combustion | d) air used for forcing burnt gases out of cylinder during exhaust |
8. In petrol engine, using a fixed octane rating fuel and fixed compression ratio, supercharging will _____ the knocking tendency.
- | | |
|----------------|--------------------------------------|
| a) . increases | b) decreases |
| c) not affect | d) initially increases and decreases |
9. Excess quantities of sulphur in diesel fuel are objectionable because it causes
- | | |
|------------------|-----------------------------|
| a) cylinder wear | b) forms corrosive acids |
| c) detonation | d) oil sludge in crank case |
10. Super charging essential in
- | | |
|---------------------|-------------------|
| a) aircraft engines | b) marine engines |
| c) petrol engines | d) diesel engines |

PART B (10 x 2 = 20 Marks)

11. Define compression ratio. What values of compression ratios are in general use for automobile engines.
12. List the main advantages of a stratified charge engine.
13. What happens to the fuel pump operation when the carburetor float chamber becomes full?
14. What is meant by distribution type fuel injection pump?
15. State two main considerations in the design of combustion chamber.
16. List out various factors that influence detonation.
17. What is the purpose of a thermostat bypass? Also, name two types of commonly used thermostat.
18. What is the significance of acid value test for lubricating oils?
19. Differentiate between super charging and turbo charging.
20. What is the purpose of dynamometer? Differentiate between absorption type and transmission type?

PART C (5 x 14 = 70 Marks)

21. a) Explain with the help of suitable sketches, the construction of Wankel engine and discuss its working. Also, compare it with conventional engines

(OR)

- b) With the help of neat sketch discuss in detail the constructional features and working of a valve actuating mechanism widely used in modern car engines.

22. a) Discuss in detail following special features of modern carburetors
- (i) Automatic mixture control (4)
 - (ii) Throttle return check (5)
 - (iii) Anti-dieseling solenoids (5)

(OR)

- b) Why is a governor absolutely necessary in case of diesel engines unlike petrol engines? Discuss the working principle of various types of governors.

23. a) (i) Describe clearly how pre ignition differs from detonation. Use simple sketches to explain this. (7)
- (ii) Discuss the various steps which should be taken to prevent knocking and detonation in IC engines. (7)

(OR)

- b) Explain the various types of combustion chambers with neat sketch. Also write its merits and de merits with each other.

24. a) What are the main components of water cooling system for an automotive engine? Describe these in detail.

(OR)

- b) Make a neat sketch showing the components of a dry sump method of engine lubrication. Explain its working. Also, compare this with wet sump lubrication method.

25. a) Write down the need for super charging. Explain the various methods of supercharging.

(OR)

- b) Briefly explain various quantities to be determined to measure the performance of an engine. Also discuss the methods to improve engine performance.
