Seat No: _____ Enrollment No: _____

PARUL UNIVERSITY

FACULTY OF ENGINEERING & TECHNOLOGY

B.Tech. Summer 2018 - 19 Examination

Semester: 6 **Date: 04/05/2019**

Subject Code: 03109353 **Time: 10:30 AM TO 1:00 PM**

Subject Name: Internal Combustion Engines **Total Marks: 60**

Instructions:

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

Q.1 Objective Type Questions - (All are compulsory) (Each of one mark) **(15)**

1. Frictional power is given by
   (a) fp= ip+ bp
   (b) fp =ip/bp
   (c) fp =ip x bp
   (d) fp= ip – bp
2. For a given value of 'r', efficiency of Otto cycle
   (a) decreases with compression ratio
   (b) increases with compression ratio
   (c) is not affected
   (d) none of the above
3. When the mixture is lean
   (a) efficiency is less
   (b) power output is less
   (c) maximum temperature and pressure are higher
   (d) all of the above
4. Time loss factor in actual cycle is due to
   (a) progressive combustion
   (b) heat loss through cylinder walls
   (c) gas leakage
   (d) friction
5. A good CI engine fuel should have
   (a) high octane number
   (b) very high cetane number
   (c) a short ignition lag
   (d) all of the above
6. For maximum thermal efficiency, the fuel-air mixture in SI engines should be
   (a) lean
   (b) rich
   (c) stoichiometric
   (d) may be rich or lean
7. Modern carburetors provide the correct quality of air-fuel mixture during
   (a) starting
   (b) idling
   (c) cruising
   (d) all conditions
8. Advantage of fuel injection in SI engine is
   (a) low initial cost
   (b) low maintenance requirements
   (c) increased volumetric efficiency
   (d) none of the above
9. For a four cylinder vertical engine, the commonly used firing order is
   (a) 1-2-3-4
   (b) 3-1-1-2
   (c) 1-3-4-2
   (d) 4-3-2-1
10. The bore and stroke of a single cylinder four-stroke engine are 100 mm and 160 mm respectively. If the brake torque is 50 NM the bmep is
    (a) 15 bar
    (b) 10 bar

(c) 5 bar
(d) 7.6 bar

11. Air standard efficiency of Otto cycle for a compression ratio of 8 is_____.
12. A spark plug have _____ number of electrodes.
13. The efficiency of Dual cycle is greater than Otto cycle in all the conditions. (True or False).
14. MPFI is used in SI engines. (True or False)
15. A two-stroke petrol engine uses _____ type of lubrication.

Q.2 Answer the following questions. (Attempt any three) **(15)**

A) Explain the procedure to find Friction power from Williams's line method.
B) Explain with a neat sketch, working of a Simple Carburetor.
C) Explain the working of a Spark plug with neat diagram.
D) Explain the stages of combustion in a Diesel Engine with a neat diagram.

Q.3 A) Explain with neat sketch Valve timing diagram for Diesel engine. Also, explain deviation of an actual cycle from an ideal cycle. **(07)**

B) What are the different types of lubrication system used in IC Engines? Explain in detail with neat diagrams. **(08)**

OR

B) Give the comparison between battery ignition system and magneto ignition system with neat diagram. **(08)**

Q.4 A) A gasoline engine working on four stroke develops a brake power of 20.9 kW. A Morse Test was conducted on the engine and the brake power (kW) obtained when each cylinder was made inoperative by short circuiting the spark plug are 14.9, 14.3, 14.8 and 14.5 respectively The test was conducted at a constant speed. Find the indicated power, friction power, mechanical efficiency and bmep when all the cylinders are firing. The bore of the engine is 75 mm and the stroke is 90 mm. The engine is running at 3000 rpm. **(07)**

OR

A) What will be the effect on the efficiency of an Otto cycle having a compression ratio of 10, if C_v increases by 2%? **(07)**

B) Explain the following in brief: (any two) **(08)**

1. Rating of fuels
2. Knocking in SI engines
3. Emissions Norms in India