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398, Ramkrishnapur Road, Barasat
Kolkata, West Bengal-700125



BRAINWARE UNIVERSITY

Term End Examination 2025-2026

Programme – B.Tech.(ME)-2023

Course Name – Internal Combustion Engine and Gas Turbine

Course Code - PEC-ME602B

(Semester VI)

Full Marks : 60

Time : 2:30 Hours

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A

(Multiple Choice Type Question)

1 x 15=15

1. Choose the correct alternative from the following :

- (i) Identify the primary objective of performance testing of an I.C. engine
 - a) Measure emissions only
 - b) Evaluate power and efficiency
 - c) Reduce engine size
 - d) Improve aesthetics
- (ii) Identify the device used for direct measurement of brake power
 - a) Indicator
 - b) Calorimeter
 - c) Dynamometer
 - d) Manometer
- (iii) Identify the method commonly used for fuel consumption measurement in SI engines
 - a) Gravimetric method
 - b) Volumetric method
 - c) Bomb calorimeter
 - d) Gas analyzer
- (iv) Identify the cycle on which an SI engine operates
 - a) Diesel cycle
 - b) Dual cycle
 - c) Otto cycle
 - d) Rankine cycle
- (v) Interpret the significance of brake mean effective pressure
 - a) Indicates engine size
 - b) Indicates engine speed
 - c) Indicates power per unit displacement
 - d) Indicates fuel quality
- (vi) Relate higher compression ratio in CI engines to performance
 - a) Lower efficiency
 - b) Higher thermal efficiency
 - c) Lower power output
 - d) Poor combustion
- (vii) Interpret the effect of friction losses on mechanical efficiency
 - a) Increases efficiency
 - b) Reduces efficiency
 - c) No effect
 - d) Improves combustion
- (viii) Apply the concept of mechanical efficiency to determine BP when IP is known
 - a) $BP > IP$
 - b) $BP = IP$
 - c) $BP < IP$
 - d) $BP = 0$
- (ix) Apply efficiency–load curve behavior to select optimum operating load

- a) No load
b) Light load
c) Medium to high load
d) Overload
- (x) Apply engine testing principles to select correct air measurement device
a) Tachometer
b) Orifice meter
c) Fuel gauge
d) Thermocouple
- (xi) Apply engine performance variables to identify factor improving efficiency
a) Poor lubrication
b) High friction
c) Proper injection timing
d) Low compression
- (xii) Identify the number of strokes in a four-stroke engine cycle
a) One
b) Two
c) Three
d) Four
- (xiii) Identify the device used to supply air-fuel mixture in SI engines
a) Injector
b) Carburetor
c) Fuel pump
d) Nozzle
- (xiv) Relate the term stoichiometric mixture to fuel-air ratio
a) Excess air
b) Exact chemical ratio
c) Excess fuel
d) No combustion
- (xv) Apply working cycle knowledge to identify an engine with one power stroke per revolution
a) Four-stroke engine
b) Two-stroke engine
c) V-engine
d) Opposed engine

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Group-B

(Short Answer Type Questions)

3 x 5=15

2. Identify the different methods used for power measurement in internal combustion engines. (3)
3. State the performance parameters commonly used to evaluate SI and CI engines. (3)
4. Explain the function SI engine. (3)
5. Distinguish between otto cycle and diesel cycle. (3)
6. Explain the concept of stoichiometric air-fuel ratio to identify the mixture condition for normal petrol engine operation. (3)

OR

Explain engine acceleration requirement with the type of fuel-air mixture supplied. (3)

Group-C

(Long Answer Type Questions)

5 x 6=30

7. Explain the construction and working of an air box method used for air flow measurement. (5)
8. List the commonly used methods to improve engine performance. (5)
9. Explain the effect of engine load variation on mechanical efficiency. (5)
10. calculate the expression efficiency of otto cycle (5)
11. Describe the same compression ratio and heat supplied, Identify the order of decreasing air standard efficiency of Otto, Diesel and Dual cycles. (5)
12. Explain the Diesel cycle on P-V and T-S planes and mention the four thermodynamic processes involved. (5)

OR

A Diesel engine has a compression ratio of 14 and cut-off takes place at 6% of the stroke the air Evaluate standard efficiency. (5)
