Total No. of Questions – [03] Total No. of Printed Pages: [02]

PRN No.	

Paper Code	U321-262A(ESE)

MAY 2022 ENDSEM EXAM

T.Y. B.TECH. (MECHANICAL) (SEMESTER - II)

COURSE NAME : INTERNAL COMBUSTION ENGINES

COURSE CODE : MEUA32182A

(PATTERN 2018)

Time: [1 Hr] [Max. Marks: 30]

Instructions to candidates:

1) **Figures to the right indicate full marks**
2) **Use of scientific calculator is allowed**
3) **Use suitable data wherever required**

Q.1 **a)** Write the concept of knocking in CI engines. **[4]**

b) Defend how following factors will help to reduce knocking in CI engine.

i. Ignition temperature of fuel
ii. Inlet temperature
iii. Ignition delay **[6]**

OR

b) Write a note on combustion process in CI engine. **[6]**

Q2 **a)** Rewrite the objectives of IC engine testing. **[4]**

b) The following observations were recorded in a test of one hour duration on a single cylinder oil engine working on four stroke cycle.

Bore = 300 mm
Stroke = 450 mm
Mass of fuel = 8.8 kg
Calorific value = 41800 kJ/kg
Speed = 200 rpm
Spring constant = 2.9 bar/cm
Area of indicator diagram = 12 cm^2
Length of indicator diagram = 6 cm
Break friction load = 1860 N
Mass of water = 650 kg
$\Delta T = 22\ ^0C$

Diameter of break wheel = 1.22 m

Calculate i) Mean effective pressure, ii) Mechanical efficiency [6]

OR

b) During a trial on an oil engine the following observations were made

Power absorbed by non-firing engine when driven by an electric motor = 10 kW
Speed of the engine = 1750 rpm
Break torque = 327.4 N-m
Fuel used = 15 kg/hr
Calorific value of fuel used = 42000 kJ/kg
Air supplied = 4.75 kg/min
Cooling water circulated = 16 kg/min
Outlet temperature of cooling water = 65.8 ^{0}C
Temperature of exhaust gas = 400 ^{0}C
Room temperature = 20.8 ^{0}C
Specific heat of water = 4.18 kJ/kgK
Specific heat of exhaust gas = 1.25 kJ/kgK

Draw up heat balance sheet on percentage basis. [6]

Q.3 **a)** Write a note on Euro stage norms. [4]

b) Write a note on emission control methods for CI engine. [6]

OR

b) Defend advantages of CNG over Petrol engine [6]

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