Register Number:……..

KUMARAGURU
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B.E DEGREE EXAMINATIONS: MAY 2018

(Regulation 2015)

Fourth Semester

AUTOMOBILE ENGINEERING

U15AUT403**:** Automotive Engines

COURSE OUTCOMES

CO1: Understand the Construction and operation of IC Engine
CO2: Understand the Fuels and Combustion in IC Engines
CO3: Apply the knowledge for Performance calculation of IC Engine

Time: Three Hours **Maximum Marks: 100**

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. Match the cross sections with appropriate Drag coefficient C_D CO2 [K_2]

	Condition		**Fuel Mixture**
A.	Cruising condition	i.	Stoichiometric Mixture
B.	Idling condition	ii.	Rich Mixture
C.	Complete combustion	iii.	Lean Mixture

	A	B	C
a)	i	ii	iii
b)	ii	iii	i
c)	ii	i	iii
d)	iii	ii	i

2. Which of these statement is correct, CO1 [K_2]
The firing order in an I.C. engine depends upon
i. Arrangement of the cylinders
ii. Design of crankshaft
iii. Number of cylinders

a) i, ii b) i, iii
c) ii, iii d) All the Above

3. A decrease in the density of air _____ the value of air-fuel ratio. CO1 [K_2]

a) Increase b) Reduce
c) Equals d) None of the above

4. The choke in an automobile meant is for supplying CO1 [K_1]

a) 500 - 1000°C b) 1500 - 2000°C

c) 1000 - 1500°C d) 2000 - 2500°C

5. Which of the statements is Correct CO1 [K_1]

Assertion (A): The thermal efficiency in I.C. engine increases as the compression ratio in I.C. engine increases

Reason (R): The compression ratio in I.C. engine is directly proportional to the thermal efficiency

a) Both are False b) A is False but the R is True

c) A is True but the R is not the correct way of explaining it. d) A is True but the R is the correct way of explaining it.

6. The combustion in compression ignition engine is CO2 [K_1]

a) homogeneous b) heterogeneous

c) laminar d) none of the mentioned

7. The volumetric efficiency is affected by CO3 [K_1]

a) the exhaust gas in the clearance volume b) the design of intake and exhaust valve

c) valve timing d) all of the mentioned

8. Which of the statements is correct CO3 [K_1]

Fuel air ratio affects maximum power output of the engine due to

A. higher specific heats

B. chemical equilibrium losses

a) A alone is correct b) Both are correct

c) Both are incorrect d) B alone is correct

9. If the spark timing is at TDC, the work is CO2 [K_1]

a) more b) less

c) equal d) None of the above

10. Diesel engine can work on very lean air fuel ratio of the order of 30:1. A petrol engine can also work on such a lean ratio provided CO2 [K_1]

a) it is properly designed b) cannot work as it is impossible

c) best quality fuel is used d) flywheel size is proper

PART B (10 x 2 = 20 Marks)
(Answer not more than 40 words)

11.	Define Scavenging.	CO1	[K_1]
12.	Define Stoichiometric Air fuel ratio, and How much it is for SI and CI engines.	CO1	[K_1]
13.	What is meant by Swirl in Combustion?	CO2	[K_1]
14.	Define Squish.	CO2	[K_1]
15.	Define Tumble.	CO2	[K_1]
16.	What are the causes of pre-ignition in SI engines?	CO2	[K_1]
17.	What is Frictional power?	CO3	[K_1]
18.	Define volumetric efficiency in an IC Engine.	CO3	[K_1]
19.	Define Firing order.	CO1	[K_2]
20.	What is a Dynamometer?	CO3	[K_2]

Answer any FIVE Questions:-
PART C (5 x 14 = 70 Marks)
(Answer not more than 300 words)

Q.No. 21 is Compulsory

21.	Briefly explain the working principle of four stroke SI engine? Also explain the functions and materials of the components used in SI engines.		CO1	[K_1]
22.	a. Compare the SI engine and CI engine	(7)	CO1	[K_1]
	b. Compare the two stroke and four stoke engine.	(7)		
23.	Explain the factors affecting ignition delay and also the influence of ignition delay on engine knocking, how to control engine knocking in CI engines.		CO2	[K_1]
24.	Explain briefly the Stages of combustion in SI Engine? Also explain the factors affecting flame propagation.		CO2	[K_1]
25.	Briefly explain with a neat sketch about various types of combustion chamber designed for SI engines.		CO2	[K_1]
26.	A six cylinder, gasoline engine operates on the four stroke cycle. The bore of the cylinder is 80 mm and the stroke 100 mm. The clearance volume per cylinder is 70 cc. At a speed of 4000 rpm the fuel consumption is 20 kg/h and the torque developed is 150 Nm. Calculate (i) Brake power, (ii) Brake mean effective pressure, (iii) Brake thermal efficiency if the calorific value of the fuel is 43000 kJ/kg, (iv) compression ratio, (v) Brake specific fuel consumption.		CO3	[K_1]
27.	Explain in detail with a neat sketch		CO3	[K_1]
	i. Prony Brake dynamometer	(7)		
	ii. Eddy current dynamometer	(7)		

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