Question Paper

Exam Date & Time: 03-Mar-2021 (02:00 PM - 05:00 PM)



THIRD SEMESTER B.TECH END SEMESTER EXAMINATIONS, MAR 2021

AUTOMOTIVE ENGINES [AAE 2172]

Α

Marks: 50

Duration: 180 mins.

Section Duration: 180 mins

Answer all the questions.

Instructions to Candidates: Answer ALL questions Missing data may be suitably assumed

1)		List the categories by which the IC engines are classified and state the specific application of small 2 stroke petrol engine, small 4 stroke petrol engines, 2 stroke diesel engines and 4 stroke diesel	(4)
	A)	engines.	
	B)	State the materials used and the manufacturing method for the following engine parts: Cylinder, Cylinder head, Piston, Piston rings, crankshaft.	(3)
	C)	Define a) Cylinder bore b) Stroke c) Compression ratio d) short circuiting e) Volumetric Efficiency f) Valve overlap with respect to IC engines.	(3)
2)	A)	The following observations were obtained during a trial on a four-stroke diesel engine, Cylinder diameter = 25 cm, stroke of the piston = 40 cm, crankshaft speed = 250 rpm, Brake load = 70 kg, Brake drum diameter = 2 m, mean effective pressure = 6 bar, diesel oil consumption = $0.1 \text{ m}^3/\text{min}$, specific gravity of diesel = 0.78 , Calorific value of diesel = 43900 kJ/kg , Find, Brake Power, Indicated Power, Frictional Power, Mechanical efficiency, Brake thermal efficiency, Indicated thermal efficiency.	(4)
	B)	Explain cross flow scavenging in 2 Stroke engines with a sketch.	(3)
	C)	Justify with proper reasons why Grey Cast iron and Aluminium alloys are used as the materials for cylinder block for IC engines.	(3)
3)	A)	Draw a neat sketch of a wet cylinder liner labelling all the parts. What are the functions and types of cylinder liner? What are the materials used for it? Also state the advantages and disadvantages of cylinder liners.	(4)
	B)	Explain any 3 types of piston failures and the reasons for the same.	(3)
	C)	Explain the single row overhead valve mechanism with a neat sketch, also mention the drawbacks of the mechanism.	(3)
4)		What is a carburettor? What are its functions? With a neat sketch explain the working of acceleration pump in the carburettor.	(4)
	A)		
	В)	Define Combustion and state the necessary conditions for combustion to take place in an IC engine.	(3)
	C)	List the advantages and disadvantages of petrol injection system.	(3)

	Explain how the in-cylinder pressure is measured using Dobbie McInnes mechanical indicator.	(4)
A)		
B)	Explain air cooling method used in IC engines, what are its disadvantages?	(3)
C)	With a neat sketch, explain the working of a gear pump used for lubrication in an IC engine.	(3)

5)

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