Hall Ticket No | | | | | | | | | | | Question Paper Code: AME552

INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad - 500 043

MODEL QUESTION PAPER- I

B.Tech VI Semester End Examinations, May – 2020

Regulations: IARE-R16

INTRODUCTION TO AUTOMOBILE ENGINEERING

(AERONAUTICAL ENGINEERING**)**

Time: 3 hours **Max. Marks: 70**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the question must be answered in one place only

UNIT – I

1.	a)	Distinguish between front engine and rear engine automobile with neat diagrams.	**[7M]**
	b)	Compare single cylinder and 3-cylinder engine of same power for automobiles with diagram.	**[7M]**
2.	a)	Describe clearly the requirements of air-fuel ratio mixtures for starting a petrol engine from cold.	**[7M]**
	b)	Compare carburetor system with direct petrol injection with neat diagram.	**[7M]**

UNIT – II

3.	a)	What is ECU? How electronic ignition systems improve the performance of engine?	**[7M]**
	b)	Compare battery and magneto ignition systems, explain adavantages of each individual	**[7M]**
4.	a)	With suitable example differentiate between Folo-thru and Bendix drive starting mechanism.	**[7M]**
	b)	Compare intelligent cooling with conventional cooling. How intelligent cooling systems improve engine performance?	**[7M]**

UNIT – III

5.	a)	Sketch and explain the construction and working of wishbone type independent front suspension.	**[7M]**
	b)	Explain the construction and working of a telescopic type of shock absorber.	**[7M]**
6.	a)	What is auto transmission? Discuss its advantages and disadvantages of auto transmission?	**[7M]**
	b)	What are the various problems encountered on wheels and tyres? How they can be eliminated?	**[7M]**

UNIT – IV

7.	a)	On suspended vacuum brakes, when will the vacuum present on both sides of the piston?	[**7M]**
	b)	Explain the construction and working of Davis steering gear mechanism.	**[7M]**
8.	a)	Why drum type hydraulic brakes are so designed that there should be residual	**[7M]**

pressure in the brake lines even when the brakes are in the released position?

b) Out of the disc and the drum brakes, which have better anti-fade characteristics and explain them? **[7M]**

UNIT – V

9. a) At what air-fuel ratio does the three way converter operate at maximum efficiency? How is this ratio achieved precisely? **[7M]**

   b) Compare the catalytic converter method with blowing of air only into the exhaust manifold **[7M]**

10. a) How does an electric assist type of choke help decrease the emission of pollutants? **[7M]**

    b) What happens when at higher speeds the crankcase emissions exceed the flow rating of the PCV valve? **[7M]**

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INTRODUCTION TO AUTOMOBILE ENGINEERING

COURSE OBJECTIVES:

The course should enable the students to:

S.No	Description
I	Understand the concept on working principles of various systems of auto mobiles and fuel supply systems.
II	Understand the working principles and operational details of cooling, ignition and electrical systems
III	Analyze the working principles and operations details of transmission and suspension systems.
IV	Evaluate the operational details and design principles of breaking and steering systems
V	Compare the effects of emissions from automobiles. And to know the ways and means of reducing emissions

COURSE OUTCOMES (COs):

CO 1:	Understand the applications of CFD in various engineering fields and to generate governing equations in conservative and non-conservative form.
CO 2:	Understand the mathematical behavior of partial differential equations and classify into hyperbolic, parabolic and elliptical natures.
CO 3:	Acquire the concepts of finite difference method through discretization and grid generation techniques.
CO 4:	Identify different CFD techniques available for different partial differential equations.
CO 5:	Explore the concepts of finite volume methods, and its difference from finite difference method.

COURSE LEARNING OUTCOMES **Students, who complete the course, will be able to demonstrate the ability to do the following**	
AME552.01	Understand the basic working of Auto mobile and different automobile components
AME552.02	Analyze the working of the basic components in the IC engines
AME552.03	Understand the importance of lubrication system in automobile
AME552.04	Compare different fuel injection system and advantages of each individual and Concept electronic controlled fuel injection
AME552.05	Compare the different cooling processes in I C engines, working of radiator and cooling accessories
AME552.06	Analyze the different spark ignition system advantages of each individual system
AME552.07	Understand the working of different automobile components like lighting system, horn, wiper, fuel gauge, temperature indicator
AME552.08	Understand the different working principles of clutches, and fly wheel
AME552.09	Analyse the transmission systems like gear boxes, propeller shafts, universal joints, differential gear boxes
AME552.10	Explain the shock absorbers, suspension system and mechanisms to used for this

AME552.11	Compare the types of braking system, working principles
AME552.12	Explain the steering system and components of steering system
AME552.13	Explain the steering mechanisms, techniques to improve better steering
AME552.14	Understand the importance of pollution controls, pollution control techniques
AME552.15	Understand the importance of alternative fuels to reduce the environment emotions
AME552.16	Analyse the different alternative energy sources to reduce the environment emotions

MAPPING OF MODEL QUESTION PAPER QUESTIONS TO THE ACHIEVEMENT OF COURSE OUTCOMES

SEE Question No.		Course Outcomes		Course outcomes	Blooms Taxonomy
1	a	AME552.01	Understand the basic working of Auto mobile and different automobile components	CO 1	Understand
	b	AME552.02	Analyze the working of the basic components in the IC engines	CO 1	Understand
2	a	AME552.02	Analyze the working of the basic components in the IC engines	CO 1	Understand
	b	AME552.04	Compare different fuel injection system and advantages of each individual and Concept electronic controlled fuel injection	CO 1	Understand
3	a	AME552.06	Analyze the different spark ignition system advantages of each individual system	CO 2	Remember
	b	AME552.06	Analyze the different spark ignition system advantages of each individual system	CO 2	Remember
4	a	AME552.07	Understand the working of different automobile components like lighting system, horn, wiper, fuel gauge, temperature indicator	CO 2	Understand
	b	AME552.05	Compare the different cooling processes in I C engines, working of radiator and cooling accessories	CO 2	Understand
5	a	AME552.10	Explain the shock absorbers, suspension system	CO 3	Understand
	b	AME552.10	Explain the shock absorbers, suspension system	CO 3	Understand
6	a	AME552.09	Analyzee the transmission systems like gear boxes, propeller shafts, universal joints, differential gear boxes	CO 3	Understand
	b	AME552.09	Analyzee the transmission systems like gear boxes, propeller shafts, universal joints, differential gear boxes	CO 3	Understand
7	a	AME552.11	Compare the types of braking system, working principles	CO 4	Understand
	b	AME552.13	Explain the steering mechanisms, techniques to improve better steering	CO 4	Understand
8	a	AME552.11	Compare the types of braking system, working principles	CO 4	Understand
	b	AME552.11	Compare the types of braking system, working principles	CO 4	Understand
9	a	AME552.14	Understand the importance of pollution controls, pollution control techniques	CO 5	Understand

	b	AME552.14	Understand the importance of pollution controls, pollution control techniques	CO 5	Understand
10	a	AME552.16	Analyse the different alternative energy sources to reduce the environment emotions	CO 5	Remember
	b	AME552.16	Analyse the different alternative energy sources to reduce the environment emotions	CO 5	Remember

Signature of Course Coordinator

HOD, AE