Total No. of Questions: 6 *Total No. of Printed Pages:3*

Enrollment No.....

Faculty of Engineering

End Sem (Odd) Examination Dec-2019

AU3CO06 Automotive Engines

Programme: B.Tech. Branch/Specialisation: AU

Duration: 3 Hrs. **Maximum Marks: 60**

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d.

Q.1 i. In a four-stroke cycle petrol engine, during suction stroke: **1**

(a) Only air is sucked in
(b) Only petrol is sucked in
(c) Mixture of air & petrol is sucked in
(d) None of these

ii. CRDI system is found in: **1**

(a) Petrol engine (b) Diesel engine
(c) CNG engine (d) LPG engine

iii. The fins on engine cylinder is provided for: **1**

(a) Air cooling (b) Water cooling
(c) Both (a) and (b) (d) None of these

iv Sometimes Antifreeze is added in coolants to: **1**

(a) Lower down the freezing point of coolant
(b) Increase the freezing point of coolant
(c) Increase the boiling point of coolant
(d) None of these

v Leaded petrol has: **1**

(a) Low knocking factor (b) High knocking factor
(c) Does not effect knocking (d) None of these

vi Combustion chamber design effects: **1**

(a) Thermal efficiency (b) Volumetric efficiency
(c) Both (a) and (b) (d) None of these

vii A turbo charger ensures: **1**
(a) To burn more fuel per second
(b) Less fuel per second
(c) Has nothing to do with combustion
(d) None of these

viii A heat balance sheet gives information about: **1**
(a) Heat supplied to the system
(b) Heat utilised by the system
(c) Both (a) and (b)
(d) None of these

ix Firing order of an engine is set to: **1**
(a) Minimize vibration (b) Improve engine balance
(c) Both (a) and (b) (d) None of these

x A flywheel is used to compensate for: **1**
(a) Fluctuation of speed (b) Fluctuation of energy
(c) Both (a) and (b) (d) None of these

Q.2 i. Draw and explain diesel cycle. **3**
ii. Explain briefly about functioning of various carburettor circuits. **7**
OR iii. Justify the advantages of CRDI system over conventional diesel injection system. **7**

Q.3 Attempt any two:
i. Explain the construction and working of an engine radiator. **5**
ii. Explain the construction and working of wet sump type lubrication system. **5**
iii. Enlist and explain any five desired properties of engine lubricants. **5**

Q.4 Attempt any two:
i. What is knocking phenomenon? In which type of engine, it occurs? How it is controlled? **5**
ii. Explain various stages of petrol engine combustion with neat sketch. **5**
iii. Explain the various factors controlling combustion chamber design of a diesel engine. **5**

Q.5 i. Compare super-charging and turbo-charging phenomenon. **3**
ii. Explain various engine power and efficiency equations. **7**
OR iii. Explain the working principle of a turbo charger with the help of a neat sketch. **7**

Q.6 i. What is a turning moment diagram? Explain with an example. **2**
ii. Explain the process of balancing of rotating masses in a single cylinder IC engine. **8**
OR iii. Explain the concept of firing order in IC Engines? Why it is never made 1-2-3-4 in a four-cylinder inline engine? **8**

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Marking Scheme
AU3CO06 Automotive Engines

Q.1	i.	In a four-stroke cycle petrol engine, during suction stroke: (c) Mixture of air & petrol is sucked in		**1**
	ii.	CRDI system is found in: (b) Diesel engine		**1**
	iii.	The fins on engine cylinder is provided for: (a) Air cooling		**1**
	iv	Sometimes Antifreeze is added in coolants to: (a) Lower down the freezing point of coolant		**1**
	v	Leaded petrol has: (a) Low knocking factor		**1**
	vi	Combustion chamber design effects: (c) Both (a) and (b)		**1**
	vii	A turbo charger ensures: (a) To burn more fuel per second		**1**
	viii	A heat balance sheet gives information about: (c) Both (a) and (b)		**1**
	ix	Firing order of an engine is set to: (c) Both (a) and (b)		**1**
	x	A flywheel is used to compensate for: (c) Both (a) and (b)		**1**
Q.2	i.	Diesel cycle explanation	2 marks	**3**
		Diagram	1 mark	
	ii.	Functioning of various carburettor circuits		**7**
		At least seven 1 mark for each	(1 mark * 7)	
OR	iii.	Advantages of CRDI system over conventional diesel injection system.		**7**
		At least seven 1 mark for each	(1 mark * 7)	
Q.3		Attempt any two:		
	i.	Construction of an engine radiator	2 marks	**5**
		Working of an engine radiator	3 marks	
	ii.	Construction of wet sump type lubrication system	2 marks	**5**
		Working of wet sump type lubrication system	3 marks	
	iii.	Any five desired properties of engine lubricants. 1 mark for each point	(1 mark * 5)	**5**
Q.4		Attempt any two:		
	i.	Knocking phenomenon	2 marks	**5**
		Type of engine, it occurs	1 mark	
		How it is controlled	2 marks	
	ii.	Stages of petrol engine combustion		**5**
		Explanation	3 marks	
		Sketch	2 marks	
	iii.	Factors controlling combustion chamber design of a diesel engine. 1 mark for each factor	(1 mark * 5)	**5**
Q.5	i.	Comparison super-charging and turbo-charging phenomenon. 1 mark for each comparison	(1 mark * 3)	**3**
	ii.	Engine power and efficiency equations. At least seven 1 mark for each equation	(1 mark * 7)	**7**
OR	iii.	Working principle of a turbo charger	2 marks	**7**
		Explanation	2 marks	
		Sketch	3 marks	
Q.6	i.	Turning moment diagram	1 mark	**2**
		Example	1 mark	
	ii.	Process of balancing of rotating masses	5 marks	**8**
		Sketch	3 marks	
OR	iii.	Concept of firing order in IC Engines It is never made 1-2-3-4 in a four-cylinder inline engine	4 marks	**8**

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