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Name of Examination (Please tick, symbol is given)	:	MID		END	✓	SUPPLE	
Name of the College (Please tick, symbol is given)	:	COES	✓	CMES		COLS	
Program/Course	:	B.Tech/ Mechanical					
Semester	:	VII					
Name of the Subject	:	Alternate Energy Sources for Automobile					
Subject Code	:	ADEG 331					
Name of Question Paper Setter	:	Mr. Avinash Kumar					
Employee Code	:	40001486					
Mobile & Extension	:	991011706					

Note: Please mention additional Stationery to be provided, during examination such as Table/Graph Sheet etc. else mention "NOT APPLICABLE":

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Date of Examination	:	
Time of Examination	:	
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Note: - Pl. start your question paper from next page

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, April, 2017

Program/course: B.Tech Mechanical	**Semester – VIII**
Subject: Alternate Energy sources for automobile	**Max. Marks : 100**
Code : ADEG 331	**Duration : 3 Hrs**
No. of page/s: 3	

Note: *(i)The question paper contains section A, B and C*
(ii) Assume suitable data if required.

SECTION-A

Note: Answer all the questions. Each question carries 5 Marks.   **[4×5=20]**

Q1. Explain the advantages of Fuel cell.

Q2. State the characteristics of hydrogen fuel which makes ultra- lean combustion in hydrogen fueled SI engine.

Q3. Researcher in Cornell University tried to run a diesel engine to run on neat hydrogen. They tried a compression ratio upto 29 to achieve compression ignition of hydrogen, but were not successful. Why?

Q4. Fill in the Blanks

a) Flammability limits of hydrogen are in the range of ……………% to…………% by volume.
b) Biodiesel has cetane number in the range of ………….
c) The only pollutant of major concerns in hydrogen operated S.I engine is…………….
d) LPG is predominantly a mixture of …………………..and …………………… in different proportions.
e) Gasohol is the mixture of …………… % and …………….%.

SECTION- B

Note: Answer all the questions. Each question carries 10 marks   **[4×10 =40]**

Q5. Describe important properties of Biodiesel and discuss its effect on the performance and emission of the engine.

Q6. Discuss the advantages and disadvantages of solar energy.

Q7. Discuss the advantages and disadvantages of bio diesel.

Q8. Explain the working of PEM fuel cell. List the types of fuel cell.

SECTION –C

Note: Q9 is compulsory and answer any one from Q10 & Q11. Each question carries 20 marks.
[2×20 =40]

Q9. (a) Explain the constructional features and working principle of hybrid vehicle.

(b) Discuss the economic and environmental impact of hybrid vehicle.

Q10. (a) Discuss the advantages and disadvantages of ethanol and methanol.

(b) In an air-standard Otto cycle, the compression ratio is 10. The condition at the beginning of the compression process is 100 kPa and 270˚C. Heat added at constant volume is 1500 kJ/kg, while 700 kJ/kg of heat is rejected during the other constant volume process in the cycle. Specific gas constant for air = 0.287 kJ/kgK. Find the mean effective pressure (in kPa) of the cycle.

OR

Q11. (a) Explain the performance and emission characteristics of ethanol fueled engine.

(b) A gasoline engine working on the Otto cycle has a cylinder of diameter of 200 mm and stroke of 250 mm. the clearance volume is 1570 cc. Find the air standard efficiency assume Cp =1.005kJ/kg K and Cv= 0.717kJ/kg K..