

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, December, 2018

Programme Name: B. Tech (Mining Engineering)

Semester : V

Course Name : Solid Fuel and Clean Coal Technologies

Time : 03 h

Course Code : PSEG 316

Max. Marks : 100

Nos. of page(s) : 2 (two)

Instructions : Answer any 5 (five) from Section A;
Answer any 6 (six) from Section B;
Section C *compulsory*;

Use figures/ tables/ flowchart when required; Do not split answers; Use legible writing; Avoid self-striking of pages.

SECTION A (Total Marks: 20)

S. No.		Marks	CO
1.	Differentiate between Allothermal and Autothermal technologies?	4	CO1
2.	List characteristics of Tar?	4	CO1
3.	What are the specific differences between primary fuels and secondary fuels?	4	CO2
4.	What are the advantages of Liquid Fuels?	4	CO2
5.	How Carbon percentage varies from Anthracite to Peat?	4	CO1
6.	How Determination of moisture content in coal is possible? Give formula?	4	CO2
7.	What is Fixed Carbon? How Fixed Carbon be measured?	4	CO2
8.	What is Coal upgrading? What are the methods for doing it?	4	CO3

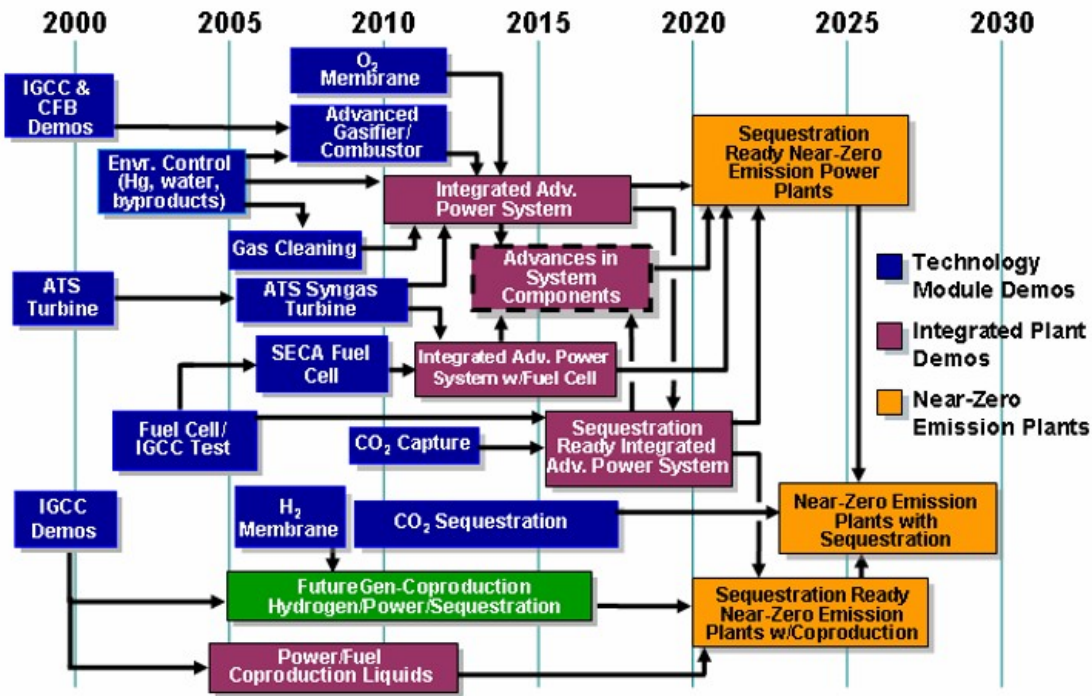
SECTION B (Total Marks: 60)

9.	a) Describe term, 'clean coal'? b) Analysis of coal is also reported in terms of some arbitrary basis? List and Explain?	3+7	CO1
10.	a) Give a suitable diagram for wet scrubbers? b) Why Coal Washing is needed?	3+7	CO3
11.	a) What are the Zero Emission Technologies? b) Give flow chart for Coal Gasification and describe Coal Gasification process?	2+8	CO4
12.	a) Give challenges of IGCC? b) What technologies contribute in improving IGCC?	2+8	CO4
13.	a) What is the objective of Fractional Distillation? b) Explain Coal Tar Distillation?	2+8	CO2
14.	a) What is the difference between Specific Heat and Calorific Value? b) Differentiate CCU and CCUS?	5+5	CO1
15.	a) What is Carbon Sequestration? b) What are the ways Carbon Sequestration is performed? Use Figure to explain?	2+8	CO2

16.	a) List Coal Gasification Reactors? b) What is the importance of Noell gasifier?	2+8	CO4
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SECTION C (Total Marks: 20)

Technology Roadmap – Future Energy Plants



17.	What are the key assumptions in Technology Road Map?	10	CO1
18.	What are the basis for the projected benefits of clean coal technologies?	10	CO4

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Name of the School (Please tick, symbol is given)	:	SOE	<input checked="" type="checkbox"/>	SOCS		SOP	
Programme	:	B. Tech (Mining Engineering)					
Semester	:	V					
Name of the Course	:	Solid Fuel and Clean Coal Technologies					
Course Code	:	PSEG 316					
Name of Question Paper Setter	:	Dr. V. L. Narasimham					
Employee Code	:	40000289					
Mobile & Extension	:	9634627546					
Note: Please mention additional Stationery to be provided, during examination such as Table/Graph Sheet etc. else mention "NOT APPLICABLE":							
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Enrolment No:



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SECTION A (Total Marks: 20)

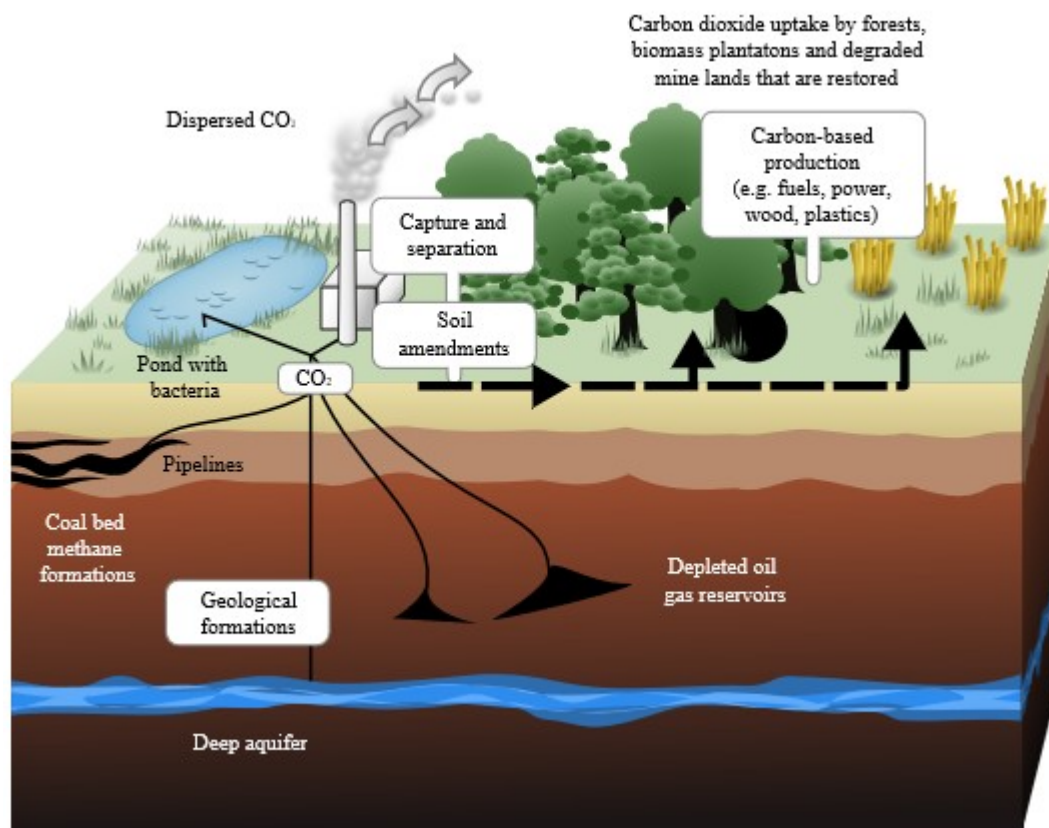
S. No.		Marks	CO
1.	What are the different types of surface mining? Comment on Hydraulic Mining?	4	CO1
2.	What are the Tar acids?	4	CO1
3.	What is Oxy-fuel Combustion?	4	CO2
4.	What are the advantages of Liquid Fuels?	4	CO2
5.	How Carbon percentage varies from Anthracite to Peat?	4	CO1
6.	How Determination of moisture content in coal is possible? Calculate using formula?	4	CO2
7.	What is Fixed Carbon? How Fixed Carbon be measured?	4	CO2
8.	What is the difference between d.a.f and d.m.m.f	4	CO3

SECTION B (Total Marks: 60)

9.	a) What are the varieties of Lignite? How are they different? b) List Coal Combustion Technologies and explain in brief?	2+8	CO1
10.	a) What is the importance of H-Coal Process? b) Explain Coal Preparation Process?	2+8	CO3
11.	a) What are the Zero Emission Technologies? b) Differentiate between Indirect and Direct Coal Liquefaction Processes?	2+8	CO4
12.	a) What technologies contribute in improving IGCC? b) Explain Oxy-Fuel Combustion?	2+8	CO4
13.	What is the difference between Coal Liquefaction and Carbon Sequestration?	10	CO1

14.	What is Float and Sink test? Draw Characteristic curve of Float and Sink test?	10	CO2
15.	a) List Coal Gasification Reactors? b) Give importance of Noell gasifier?	2+8	CO4
17.	a) Which kind of feed is more suitable for direct coal liquefaction? Give scientific reasons? b) Which coal deposits in India are more suitable for the conversion into liquid fuels? Justify?	5+5	CO3

SECTION C (Total Marks: 20)



<https://upload.wikimedia.org/wikipedia/commons/b/b5/>

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18.	What the above diagram enabling you to understand? List technically relevant terms?	5	CO1
19.	Identify different types of Fossil Fuels? Summarise Advantages and Disadvantages?	15	CO1