

|               |  |
|---------------|--|
| Name:         |  |
| Enrolment No: |  |

## UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

**End Semester Examination, December, 2019**

**Programme Name: B. Tech (Mining Engineering)**

**Semester : V**

**Course Name : Solid Fuel and Clean Coal Technologies**

**Time : 03 h**

**Course Code : PEMI 3005**

**Max. Marks : 100**

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

**3Instructions: Use figure wherever it is required.**

### SECTION A

| S. No. |   | Marks | CO  |
|--------|---|-------|-----|
| 1.     | List various parameters on the gas contents of coal? How the ratio of gas content between pure coal to dirty coal is represented? | 3     | CO1 |
| 2.     | Represent coal matrix using suitable figure? Identify face cleats and butt cleats?  | 3     | CO2 |
| 3.     | What is/are the important factor(s) during Well-type Optimization?  | 3     | CO3 |
| 4.     | Show Multidirectional fractures because of induced stress?  | 3     | CO2 |
| 5.     | Differentiate Coal Bed Methane and Coal Mine Methane?   | 3     | CO4 |
| 6.     | Identify governing factors that might spike interest in exploring unconventional energy sources?                                  | 3     | CO4 |
| 7.     | Examine different criteria used in coal ranking?  | 3     | CO1 |
| 8.     | Outline different Coal combustion waste along with list of Trace Elements?  | 3     | CO3 |
| 9.     | Critically Examine Hydrogen Market and its viability?   | 3     | CO2 |
| 10.    | What is the role of Global Gas Flare Reduction (GGFR) Partnership?  | 3     | CO3 |

### SECTION B

|     |   |     |     |
|-----|---|-----|-----|
| 11. | Examine different CBM Production Methods? Comment suitable Method for Indian CBM Production Operations? | 6+4 | CO2 |
| 12. | Explain Direct Liquefaction and Indirect Liquefaction in Coal Liquefaction?                             | 10  | CO1 |

|   |  |     |             |
|---|--|-----|-------------|
| 13a.  | Examine Distinctive Design and Operating Characteristics of all the 5-Coal firing Configurations of Coal-Fired Electric Generating Unit (EGU)? | 10  | CO2         |
| <b>(OR)</b>   |  |     |             |
| 13b.  | Compare and bring-out conclusions on Coal Combustion Processes among PC, FBC and IGCC?   | 10  | CO2         |
|   |  |     |             |
| 14a.  | Draw Coal Cleaning Plant Process Flow diagram? Review Dry Cleaning Process?  | 7+3 | CO3+<br>CO4 |
| <b>(OR)</b>   |  |     |             |
| 14b.  | What are the Major Influences in Coal Preparation? Comment on Indian Legislation?  | 7+3 | CO3+<br>CO4 |
|   |  |     |             |
| 15a.  | Critically Review on Gas Flaring and Challenges?   | 10  | CO3         |
| <b>(OR)</b>   |  |     |             |
| 15b.  | Explain Different Gas Flaring Measurement Techniques?  | 10  | CO3         |
| <b>SECTION-C</b>  |  |     |             |
| <p>Under the Coal Transitions project, national expert teams in China, India, South Africa, Australia, Poland and Germany explored pathways for the coal transition with regard to the energy and socio-economic systems. These scenarios were required to be consistent with the respective countries' carbon budget in line with the "below 2°C" goal.</p> <p>A first key observation from the energy system transformation scenarios is that (often rising) national consumption demands can be met either with zero coal or with minimal amounts of coal.</p> <p>A second observation is that the incremental cost of coal transitions scenarios for the energy system were found to be likely to be affordable for energy consumers compared with no-action scenarios based on today's technologies.</p> <p>A third important finding is that universal electricity access – and economic growth – can be ensured in these developing countries (i.e. South Africa and India) while also phasing down thermal coal in the power sector.</p> <p>Above diagram represents Time Horizons of Workforce Planning Strategies</p> |  |     |             |
| 16.   | Do you agree that national electricity needs are possible to meet with zero coal? Support your arguments?                                      | 3+7 | CO1+<br>CO4 |
| 17.   | What is universal electricity access? How to overcome phasing down of thermal coal in power sector?  | 3+7 | CO1+<br>CO4 |