

BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION MO2022)

CLASS: BTECH
BRANCH: CS/IT/ECE/PIE

SEMESTER : VII
SESSION : MO/2022

SUBJECT: CL322 ENERGY ENGINEERING
TIME: 03 Hours

FULL MARKS: 50

INSTRUCTIONS:

1. The question paper contains 5 questions each of 10 marks and total 50 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
4. Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates

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|--------|--|-----|---------|
| Q.1(a) | Define Energy Audit | [2] | CO1,BL1 |
| Q.1(b) | Compare open cycle and closed cycle gas turbine cogen. systems with figures. | [3] | CO1,BL2 |
| Q.1(c) | Select and explain any two waste heat recovery devices that can be used for medium temperature waste heat recovery with neat figures and details | [5] | CO1,BL5 |
| Q.2(a) | Distinguish phases in coke production and explain them in detail | [5] | CO2,BL4 |
| Q.2(b) | Define Visbreaking and explain types of visbreaking process with illustrations | [5] | CO2,BL2 |
| Q.3(a) | Outline water gas shift reaction & explain its importance with reference to applications | [2] | CO2,BL2 |
| Q.3(b) | Analyze the functioning of Tokamak with neat diagram | [3] | CO4,BL4 |
| Q.3(c) | Outline nuclear fuel cycle with a neat diagram and explain all the steps involved in it | [5] | CO4,BL2 |
| Q.4(a) | Name various sources from which energy can be extracted from oceans | [2] | CO4,BL1 |
| Q.4(b) | Illustrate figures of (i) Dry steam Geothermal power plant (ii) Downdraft gasifier (iii) penstock | [3] | CO3,BL2 |
| Q.4(c) | Prove that max. possible wind turbine efficiency is 0.5926 through derivation of Betz equation mentioning all assumptions and diagram | [5] | CO3,BL5 |
| Q.5(a) | Explain working principle of solar PV cell | [2] | CO4,BL2 |
| Q.5(b) | Identify and briefly explain the fuel cells that are suitable for stationary power generation with neat figures and salient points | [3] | CO4,BL3 |
| Q.5(c) | Explain production of hydrogen via iodine/sulfur thermochemical cycle | [5] | CO4,BL2 |

:::::28/11/2022:::::M