BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID SEMESTER EXAMINATION)

CLASS: BTECH   SEMESTER: III
BRANCH: EEE   SESSION: MO/2022

SUBJECT: EE203 ELECTRIC ENERGY GENERATION AND CONTROL

TIME: 2 HOURS   FULL MARKS: 25

INSTRUCTIONS:
1. The total marks of the questions are 25.
2. Candidates attempt for all 25 marks.
3. Before attempting the question paper, be sure that you have got the correct question paper.
4. The missing data, if any, may be assumed suitably.
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.

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Q1	(a)	What are the different types of fuel used in steam power plants? Why pulverized fuel is preferred in coal fired thermal power plant?	[2]	CO1, CO2	1,2
Q1	(b)	Explain the characteristics features of a fire tube boiler. How is it different from a water tube boiler?	[3]	CO1, CO2	2
Q2	(a)	What are the uses of fly ash?	[2]	CO1, CO2	1
Q2	(b)	What is the function of air preheater? How does air preheating save fuel?	[3]	CO1, CO2	2
Q3	(a)	What type of turbine would you recommend for the following heads? (i) 1000 m (ii) 150 m (iii) 20 m	[2]	CO1, CO2	2
Q3	(b)	The following data refers to a proposed hydroelectric power plant. Available head = 27m, Catchment area = 430 km^2, Rainfall = 150cm/year, Percentage of total rainfall utilized = 65%, Penstock efficiency = 95%, Turbine efficiency = 80%, generator efficiency = 86% and load factor = 0.45. Calculate the power developed and suggest suitable turbine for the plant.	[3]	CO1, CO2	3
Q4	(a)	What is surge tank? Why is it important in a hydro-plant?	[2]	CO1, CO2	1
Q4	(b)	Define specific speed of a turbine. Compare the different hydro-turbine with respect to their specific speed.	[3]	CO1, CO2	1,2
Q5	(a)	What do you mean by mass defect and binding energy?	[2]	CO1, CO2, CO3	1
Q5	(b)	Explain the difference between chemical and nuclear reactions.	[3]	CO1, CO2, CO3	2

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