



PAPER ID : 71077

Paper ID and Roll No. to be filled in your Answer book

Roll No.

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B. Tech.

(SEM. VII) (ODD SEM.) (REG.) EXAMINATION, 2012-13

ENERGY CONSERVATION

Time : 3 Hours]

[Total Marks : 100

- Note :
- (1) Answer all questions.
 - (2) Assume any missing data suitably.

1 Answer any two of the following : 10×2=20

- (a) What do you understand by proximate and ultimate analysis of coal ? What are the uses of these analyses when coal is to be used as fuel in power plant ?
- (b) The effective burning of volatiles is essential for better performance of boiler because its ineffective burning increases un-burnt carbon loss also. Discuss.
- (c) List out the major advantages of high pressure boilers in modern thermal power plants. What are the main problems encountered to the water side of the boiler tubes ? How these are solved in practice ?

2 Answer any two of the following : 10×2=20

- (a) Why protective devices are required for steam turbine ? Explain the working of different types of protective devices with neat sketches

- (b) What is the function of air pre-heater ? How does air preheating save fuel ? Why economizer is essentially used irrespective of the fuel used in boiler furnace ?
- (c) A central power station has annual load factor, capacity factor and use factor as 60%, 40% and 45% respectively. The maximum demand is 15 MW. Estimate (a) the annual energy production and revenue earned if the cost of energy is Re 1 per kWh (b) the reserve capacity over and above the peak load (c) the hours per year the station is not in service.

3 Answer any **two** of the following : 10×2=20

- (a) What are the major drawbacks of a conventional FBC system ? What changes are suggested to overcome the same ?
- (b) Why are steam turbines compounded ? What are the different methods of compounding ? List out the causes of losses in steam turbines and mention the preventive measures to be taken to reduce them.
- (c) What are the different economic sources of waste heat ? How are they graded ?

4 Answer any **two** of the following 10×2=20

- (a) Availability of fuel and moderator generally controls the economic selection of the reactor. Justify the statement.
- (b) What are the basic features of a waste heat boiler compared with conventional boiler ? Draw a neat sketch of a boiler where waste wood is used as a fuel.
- (c) Discuss in detail how the load between two alternators of generating station can be divided for the best economy.

Write short notes on any **four** of the following : $5 \times 4 = 20$

- (a) Need and Objectives of energy audit
 - (b) Walk through energy audit
 - (c) Preliminary Energy audit
 - (d) Power factor improvement and its benefit
 - (e) Cogeneration and Tri-generation.
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