



Printed Pages : 3

TME - 801

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 0480

Roll No.

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## B. Tech.

(SEM. VIII) EXAMINATION, 2008-09

### POWER PLANT ENGINEERING

Time : 3 Hours]

[Total Marks : 100

- Note :
- (1) Attempt **all** the questions.
  - (2) All questions carry **equal** marks.
  - (3) Use of Steam tables is allowed.

1 Attempt any **two** parts of the following: **10x2**

(a) Explain with the help of neat diagrams a 'Regeneration cycle'. Derive also an expression for its thermal efficiency.

(b) (i) What is meant by load curve? Explain its importance in power generation.

(ii) Define 'depreciation' and explain its significance.

(c) From the following data calculate the cost of generation per unit delivered from the power plant:

Installed Capacity of power plant - 200 MW

Annual load factor = 0.4

Capital Cost of power plant = Rs.280 lacs

Annual Cost of fuel, oil, salaries, taxation = Rs.60 lacs

Interest and depreciation = 13%



2 Attempt any **two** parts of the following: **10x2**

- (a) What are the essentials of a good boiler? Describe a high pressure water tube boiler. Explain boiler rating and boiler efficiency.
- (b) Explain the necessity of reheating of steam. Explain a reheat cycle and derive an expression for the thermal efficiency of a reheat cycle.
- (c) Describe the function of cooling ponds and cooling towers in thermal stations. With the help of a neat diagram explain a 'once through cooling system.'

3 Attempt any **four** parts of the following: **5x4**

- (a) List the advantages and disadvantages of diesel power plants.
- (b) Draw a ray diagram of common rail fuel injection system and describe.
- (c) What is pre-ignition? What are the disadvantages of pre-ignition?
- (d) Discuss the effect of various thermodynamic variables on the thermal efficiency of a simple open cycle gasturbine plant.
- (e) What is reheating? Show the variation of thermal efficiency with pressure with and without reheating.
- (f) Name the various fuels used in gas turbine.

4 Attempt any **four** parts of the following: **5x4**

- (a) What is the function of a reactor? Differentiate between Homogenous and Hetrogeneous reactors.
- (b) What are the various factor for selecting the site for nuclear power plant? What is the future of nuclear power?



- (c) Describe a hydro power plant.
- (d) What is fare bay? Describe a pumped storage power plant.
- (e) What do you understand by Solar Energy Storage? Describe a solar pond.
- (f) Describe a wind mill.

5

Attempt any **two** parts of the following:

**10x2**

- (a) Explain the principle of generator with the help of a neat diagram. Describe a three phase generator.
- (b) Explain briefly the following:
  - (i) Electrical Transducer
  - (ii) Electromagnetic Transducers
- (c) How thermal power plant pollutes air? Discuss the harmful effect of  $\text{CO}_2$ ,  $\text{CO}$ , compounds of sulphur and oxides of Nitrogen.

