

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

PAPER ID: 0480

Roll No.

B. Tech.

(SEM. VIII) EXAMINATION, 2008-09

POWER PLANT ENGINEERING

Time : 3 Hours]

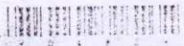
[Total Marks : 100

- 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%

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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 Heterogeneous reactors.
- (b) What are the various factors 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 CO_2 , CO, compounds of sulphur and oxides of Nitrogen.