



Printed Pages : 4

TEE - 604

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

PAPER ID : 2062

Roll No.

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B. Tech.

(SEM. VI) EXAMINATION, 2008-09

POWER STATION PRACTICE

Time : 3 Hours]

[Total Marks : 100

Note : Attempt **all** questions.

1 Attempt any **four** parts of the following: $5 \times 4 = 20$

- (a) What are the main considerations for selection of site for a thermal power station?
- (b) Briefly discuss the functions of Condenser in a thermal power station.
- (c) Briefly discuss the function of pulverizing plant in a thermal power station.
- (d) Briefly discuss the function of surge tank in a hydroelectric power station.
- (e) Briefly discuss the function of pen stock in a hydro electric power station.
- (f) Briefly describe impulse turbine used in hydro electric station.

2 Attempt any **four** parts of the following : $5 \times 4 = 20$

- (a) What considerations have to be kept in mind while selecting site of nuclear power plants ?
- (b) Explain with a neat sketch the various parts of nuclear reactor.



- (c) Discuss the operational principle of Gas turbine plant.
- (d) Draw the plant layout of a diesel power plant.
- (e) Discuss the advantages and disadvantages of a diesel power plant.
- (f) Why hot gas at high pressure and not hot gas at atmosphere pressure is used in gas turbine power plant?

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

- (a) What are the different types of bus-bar arrangements used in sub-stations? Illustrate your answer with suitable diagrams.
- (b) A power station has to meet the following demand :
 - Group A: 200 kW between 8 A.M. and 6 P.M.
 - Group B: 100 kW between 6 A.M. and 10 A.M.
 - Group C: 50 kW between 6 A.M. and 10 A.M.
 - Group D: 100 kW between 10A.M. and 6 P.M. and then 6. P.M. and 6 A.M.

Plot the daily load curve and determine

- (i) Diversity factor
- (ii) Units generated per day
- (iii) Load factor.
- (c) A power plant is working at its maximum kVA capacity with a lagging p.f. of 0.7. It is now required to increase its kW capacity to meet the demand of additional load. This can be done,
 - (i) By increasing the p.f. to 0.85 lagging by p.f. correction equipment.

OR

- (ii) By installing additional generation plant costing Rs.800 per kVA.

What is the maximum cost per kVA of p.f. correction equipment to make its use more economical than the additional plant?



4 Attempt any TWO parts of the following: $10 \times 2 = 20$

- (a) What are the advantages of interconnection of power stations? Two power stations, one station and the other hydro, how they will be connected in parallel? Which will be used as base load station and which will be used as peak load station? Justify your answer.
- (b) Explain the optimum economic operation of power system considering transmission losses.
- (c) Determine the economic operation point for the three thermal units when delivering a total of 1000 Mw.

Unit A $P_{\max} = 600 \text{ Mw}, P_{\min} = 150 \text{ Mw}$

I-O Curve : $H_A = 500 + 7P_A + 0.0015 P_A^2$

Unit B : $P_{\max} = 500 \text{ Mw}, P_{\min} = 125 \text{ Mw}$

I-O Curve : $H_B = 300 + 7.88 P_B + 0.002 P_B^2$

Unit C $P_{\max} = 300 \text{ Mw}, P_{\min} = 75 \text{ Mw}$

I-O Curve: $H_C = 80 + 7.99 P_C + 0.005 P_C^2$

Fuel costs :

Unit A : 1.1 unit of price/M B tee

Unit B : 1.0 unit of price/ M B tee

Unit C : 1.0 unit of price/ M B tee

Find the values of P_A , P_B and P_C for optional operation.

5 Attempt any **four** parts of the following : $5 \times 4 = 20$

- (a) Discuss how the power crisis can be solved by joint venture of public and private sectors.
- (b) Write the advantages and disadvantages of MHD generation.



- (c) What is photovoltaic cell? Where they are used?
- (d) Explain how wind turbines are used for generating electrical power.
- (e) What is geothermal energy? How geothermal energy can be used for generating power?
- (f) Discuss the problems associated with conversion of Ocean thermal energy into electrical power.

