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RM-7107

B. E. - III (Sem. VI) (Electrical) Examination

May / June – 2010

Power Station Practice

Time : **3** Hours] [Total Marks :

Instructions :

(1)

નીચે દર્શાવેલ ☛ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
Fillup strictly the details of ☛ signs on your answer book.

Name of the Examination :

☛ **B. E. - 3 (Sem. 6) (Electrical)**

Name of the Subject :

☛ **Power Station Practice**

☛ Subject Code No. : **7 1 0 7** ☛ Section No. (1, 2,.....) : **1&2**

Seat No. :

Student's Signature

(2) Answer **all** questions.

(3) Answer to the **two** section must be written in **separate** answer book.

(4) Figures to the Right indicate marks.

(5) Supplement your answer with neat sketches and mention assumptions made clearly.

SECTION - I

1 (a) Fill in the blank. **5**

(i) A plant producing both electrical power and process heat simultaneously is called _____ plant.

(ii) In a GT-ST power plant_____ type of steam generator is used.

(iii) A qualitative evaluation method, called _____ has been devised to determine the extent of caking of a coal.

(iv) In an MHD generator the _____ replaces the copper windings of an alternator.

(v) Internal irreversibility of Rankine cycle is caused by _____, _____ and _____.

(b) Do as directed. **10**

(i) What do you mean by Repowering?

(ii) What is NPSH? What is its significance?

(iii) Define metallurgical limit.

(iv) Where is co-generation used? Give examples.

(v) What is the function of Economiser and Superheater?

(c) What are the advantages and disadvantages of gas turbine power plant over diesel and thermal power plant. **5**

2 (a) Discuss in detail the Rankine cycle of a coal fired thermal power station using T.S. diagram. **7**

(b) Discuss various types of condensers used with the boilers. Explain in detail the condensers used with modern steam power plant. **8**

OR

(b) With the help of a neat schematic layout explain the working of following feeding system for pulverised coal to the boiler. **8**

(i) Direct firing system

(ii) Semi-direct firing system.

3 (a) Explain in detail the working of combined cycle MHD - steam generation plant with proper T-S diagram. **8**

(b) Write a short note on non-conventional sources of electric power generation. **7**

OR

(b) Explain working and requirement of electrostatic precipitator in thermal power plant. **7**

SECTION - II

4 (a) Identify whether the following statements are true or false. **5**

(i) No moderator is used in fast breeder reactors.

(ii) Francis turbine is used for high heads.

(iii) MHD power plants use steam at very low pressure for power generation in steam turbines.

(iv) In nuclear power plant, the reflector bounces back most of the neutrons that escape from the fuel core.

(v) Control rods are made of cadmium.

(b) Fill in the blanks : **5**

(i) The transformation of one element into another by a nuclear reaction is known as _____.

(ii) A steam condenser is basically a_____.

(iii) _____ wind is an upslope, rising wind.

(iv) A _____ reactor is heavy water cooled and moderated reactor.

(v) The process by which solar energy can be utilised to provide thermal energy is known as _____ process.

(c) What is chain reaction? How is it controlled? **3**

(d) At the end of a power distribution system, a certain feeder supplies three distribution transformers, each one supplying a group of customers whose connected loads are as under : **7**

Transformer	Load	Demand Factor	Diversity of Groups
Transformer No 1	10 kW	0.65	1.5
Transformer No 2	12 kW	0.6	3.5
Transformer No 3	15 kW	0.7	1.5

If the diversity factor among the transformers is 1.3, find the maximum load on the feeder.

5 (a) How are nuclear reactors classified? Describe some common types of reactors used for electrical power generation. **10**

(b) Discuss the advantages and disadvantages of hydro electric power generation over thermal power generation. **5**

OR

5 (a) Draw the neat schematic layout of a combined cycle GT-ST plant and explain its working with the help of T-S chart. Also discuss merits and demerits of supplementary firing used with combined cycle GT-ST plant. **9**

(b) What is meant by cavitation? How and where does it occur in a water turbine? Why does it become necessary to install a water turbine below tail race level? **6**

6 Attempt any **three** : **15**

(i) Describe the field of use of different types of hydro plants.

(ii) Write short note on electrostatic precipitator.

(iii) Discuss various types of condensers used with the boilers. Explain in detail the condenser used with modern T.P.S.

(iv) Explain base load power plant and peak load power plant.

(v) Write short note on surge tank.
