

[Total No. of Questions - 9] [Total No. of Printed Pages - 3]  
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B. Tech 7th Semester Examination

Power Plant Engineering (NS)

EE-411(b)/EEE-411(b)

Time : 3 Hours

Max. Marks : 100

*The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.*

**Note :** Attempt five questions in total selecting one question from each of the section A, B, C and D and all subparts of the question in section E.

**SECTION - A**

1. (a) What is function of draft tube in hydroelectric generating plant? How can suitable designing of draft tube reduce the effect of cavitation? (12)
- (b) What are the considerations made in selecting a site for hydroelectric power generation? Discuss each point in brief. (8)
2. (a) Draw a neat diagram of Pelton turbine and explain its operation. Why these turbines are used for high head? (12)
- (b) Explain the function of speed governor used to regulate the speed of the hydroturbine. Draw a neat sketch of speed governor. (8)

**SECTION - B**

3. (a) What is the use of super-heaters in a thermal power plant? How does super-heater operate? What will happen if super-heater is not used? (12)

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- (b) What are the features of steam turbines? Give a comparative study of impulse and reaction turbine. (8)
4. (a) Draw a clear diagram of electrostatic precipitator. Why is it used in thermal power plant? Explain its operation with advantages. (12)
- (b) Write a brief account of fuel burning in the thermal power plant. What are the differences between the overfeed stokers and underfeed stokers? (8)

**SECTION - C**

5. (a) How does the material selected for the use in the nuclear reactor? Discuss in context with the reactor coolants, moderators, reflectors and fuel. (10)
- (b) Explain the operation of fast breeder reactor. What are its advantages over other reactors? (10)
6. (a) Describe the operation of CANDU reactor. Explain its advantages and disadvantages. (12)
- (b) Describe the nuclear fusion and nuclear fission reaction. Compare these reactions. Which types of reaction is used in nuclear reactor and explain why is it used? (8)

**SECTION - D**

7. Show essential parts of a diesel engine with the help of a diagram. Describe the function of each component in brief. (20)
8. (a) What are the advantages of HVDC system? What are the requirements of instrumentation used in HVDC system? (10)
- (b) Describe a control scheme used in plant operation especially to control the temperature rise of steam turbine. (10)

**SECTION - E**

9. (a) Define and explain the following terms:  
(i) Demand factor      (ii) Load factor
- (b) Compare Francis and Kaplan turbine based on its applications.
- (c) What are the factors considered in selecting a site for thermal power plant?
- (d) What are the advantages of fluidized bed combustion?
- (e) Draw a neat diagram of Pressurizer Water Reactor and show all its part.
- (f) What are the characteristics of fertile materials?
- (g) How do we classify IC engines?
- (h) Draw a clear diagram of series flow plant with reheat between power turbine stages of a gas power plant.
- (i) Why do we need to dispatch load economically?
- (j) What are the instrumentations used in hydroelectric power station? (10×2=20)