



**ELECTIVE - II**  
**Power Plant Engineering**  
**(New) (1311)**

**P. Pages : 2**

**Time : Three Hours**

**Max. Marks : 100**

Instructions to Candidates :

1. Do not write anything on question paper except Seat No.
2. Answer sheet should be written with blue ink only. Graph or diagram should be drawn with the same pen being used for writing paper or black HB pencil.
3. Students should note, no supplement will be provided.
4. All question are compulsory and solve **any two** bits out of a, b & c in each question.
5. Draw neat sketches wherever necessary.
6. Assume suitable data if required.
7. Use of non - programmable calculator is allowed.

**UNIT - I**

1. a) Draw a general layout of a thermal power plant and explain the working of different circuits. **10**
- b) What do you understand by proximate and ultimate analysis of coal ? What are the uses of these analysis when coal is to be used as fuel in power plant ? **10**
- c) Draw a net line diagram of input coal handling and indicate the names of equipments used at different stages. **10**

**UNIT - II**

2. a) Explain the construction of flow duration curve and discuss its importance in comparing the power potentiality of different storages used for power generation. **10**
- b) How do hydro - electric power plant are classified ? Explain in details. **10**
- c) A turbine develop 5400kw at 200 rpm under a head 240 m at an efficiency of 82%. The wheel diameter is 3m. **10**
  - a) Compute the flow rate, unit speed, unit power, unit flow & specific speed.

- b) For this turbine what would be the speed, power and flow under a head of 160m.
- c) If a similar unit is to develop 2850 kw under a head of 183m. Find its diameter, speed and rate of flow.

**UNIT - III**

3. a) Draw a neat diagram of nuclear reactor and explain the function of different components. **10**
- b) What are the different types of nuclear wastes ? Which are more dangerous and why ? **10**
- c) Draw a neat line diagram of a diesel power plant, showing all the systems & explain it. **10**

**UNIT - IV**

4. a) Prove that the pressure ratio of a closed cycle for the maximum specific output is the square root of the pressure ratio for the maximum thermal efficiency why low pressure ratio is used in gas turbine ? What is the range of it ? **10**
- b) What are the effects on the thermal efficiency and specific output of gas turbine plant of the following factors i) load on the plant ii) Pressure ratio iii) Turbine inlet temperature iv) Compressor inlet temperature. **10**
- c) Calculate the efficiency and specific work output of a simple gas turbine plant operating on Brayton cycle. The maximum and minimum temperature are 1000k and 288k respectively. The pressure ratio is 6. The isentropic efficiencies of the compressor and turbine are 85% and 90% respectively. If the unit consumes 2 tonnes of oil per hour of C. V. 46500 kJ/per kg. determine the power generated. The mechanical efficiency is 90% and the generation efficiency is 85%. **10**

**UNIT - V**

5. a) What are the different types of switch gear installations ? Discuss their relative merits & demerits. **10**
- b) Describe the different methods used for earthing a power system. Discuss their relative merits and demerits. **10**
- c) Explain the working of air circuit breaker with a neat sketch and list out its limitations. **10**

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