



NEW SCHEME

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Fifth Semester B.E. Degree Examination, January/February 2005

Electrical & Electronics Engineering
Electrical Power Generation

Time: 3 hrs.]

[Max.Marks : 100

Note: 1. Answer any FIVE full questions.
 2. Any missing data may be suitably assumed.

1. (a) Explain the general arrangement and operation of a hydro electric plant. (6 Marks)
- (b) Discuss how hydro electric plants are classified according to available head. (8 Marks)
- (c) What is run-off? Discuss about the hydrograph, flow duration curve and mass curve. (6 Marks)
2. (a) Draw schematic layout of a typical thermal power plant and explain the working of boilers. (10 Marks)
- (b) Describe how coal is handled starting from delivery of coal to final combustion stage. Also explain about ash disposal and dust collected in a thermal station. (10 Marks)
3. (a) Describe briefly various types of nuclear reactions. (6 Marks)
- (b) Explain the functions of various parts of nuclear reactor. (5 Marks)
- (c) Explain the principle of operation of CANDU type reactor. (6 Marks)
4. (a) What are the advantages of gas turbine plants over steam plants? (6 Marks)
- (b) Discuss briefly about the choice and characteristics of diesel engines. (6 Marks)
- (c) Describe the methods to improve thermal efficiency of gas turbine plants. (8 Marks)
5. (a) Define the terms :
 i) Diversity factor ii) Load factor iii) Plant capacity factor. (6 Marks)
- (b) Explain the procedure adopted for :
 i) Two part tariffs ii) Power factor tariffs. (8 Marks)
- (c) A power supply is having the following loads : (6 Marks)

Type of load	Maximum demand (KW)	Diversity of group	Demand factor
Domestic	15,000	1.25	0.7
Commercial	25,000	1.2	0.9
Industrial	50,000	1.3	0.98

If the overall diversity factor is 1.5, determine

- i) The maximum demand and
- ii) Connected load of each type.

6. (a) If it is desired to improve pf from $\cos\phi_1$ to $\cos\phi_2$ by keeping KVA of the system at a constant value Q . Derive an expression for KVA capacity of the phase advancing plant. (6 Marks)
- (b) Explain :
- Advantages of outdoor substation
 - Double Bus-bar scheme. (6 Marks)
- (c) A factory has induction motor and has a maximum demand of 800 KW at 0.707 pf lag. The consumer is charged at the rate of Rs.80 / KVA of the maximum demand. The increase in load has been met with by installing a synchronous motor of 200 HP (metric) and efficiency of 90%. If the synchronous motor works at full load and pf 0.9 load, calculate the difference in annual fixed charges of the consumer. (8 Marks)
7. (a) Explain in detail about of earthing of neutral point by
- Solid grounding
 - Resistance grounding. (10 Marks)
- (b) A small generating station has two alternators of 2500 KVA and 5000 KVA and percentage reactances 8 and 6 respectively. The circuit breakers are rated at 1,50,000 KVA. Due to increase in system load it is intended to extend the system by a supply from the grid via a transformer of 10,000 KVA rating and 7.5% reactance. If the system voltage is 3300 Volts, find the reactance necessary to protect the switch gear. (10 Marks)
8. (a) What are the effects of low pf and what are the methods of improving pf ? (6 Marks)
- (b) Explain neutral earthing transformer and its application in power systems. (6 Marks)
- (c) Generators A and B are identical and rated 13.8 KV, 21000 KVA and have a transient reactance of 30% at own base KVA. The transformers are also identical and are rated 13.8/66 KV, 7500 KVA and have a reactance of 8.4% to their own KVA base. The tie line is 50 miles long, each conductor has a reactance of 0.848 ohm per mile. The three phase fault is assumed at F, 20 miles away from station A . Find the current in the short circuit. (8 Marks)



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