

COLLEGE OF ENGINEERING & TECHNOLOGY

Department: Electrical & Control Engineering

Lecturer : Dr. Ahmed Lotfy

Course : Electrical Power Stations

Course Code: EE 542

Date : 14 / 01 / 2013

Starting Time: 11:30

Marks: 40

Time: 2 hours



Final Examination Paper

Answer the following questions:

1. A power generating station comprises two identical 60 MVA alternators operated in parallel. The governors of the alternators have droops from no-load to full-load of 2% and 6% respectively. Find:
- **The share** of each machine if the total load was 100 MVA at unity power factor
 - **The governor's setting** (in terms of % adjustment in no-load speed) needed to force both machines to share the load equally.

[B2] (10 Marks)

- 2.a Draw with illustrations the schematic arrangement of a gas power station, and discuss its disadvantages

[A4] (5 Marks)

- 2.b. A generating station has a maximum demand of 25 MW, a load factor of 60%, a plant capacity factor of 50%, and a plant use factor of 72%. Find the following:

- The reserve capacity of the plant
- The daily energy produced.
- The maximum daily energy that could be produced if the plant were fully loaded while running as per schedule.

[B2] (5 Marks)

Members of course Examination Committee:	Signature of Members of course Examination Committee:	Date:
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Head of Department: Prof. Hamdy Ashour		/1/2015

3.a Define Plant equipment depreciation, then discuss how to determine depreciation using the straight line method showing the relevant disadvantages.

[A8] (5 Marks)

3.b . Draw the torque / speed characteristics of a turbine's governor, and use the characteristics to show the governor's operation in case of sudden electric load change.

[A4, A8] (5 Marks)

4.a. Show with the aid of illustrative drawing the cooling process of the reactor in a nuclear power station.




[A4, A8] (5 Marks)

4.b. Give reasons for forcing a power factor tariff and list its types, then find the cost of capacitive reactive volt amperes needed to raise the power factor of a station to 0.9 lagging if the station supplies the following loads:

	Active power (kW)	Power factor
Load 1	1500	0.7 lagging
Load 2	250	Unity
Load 3	1000	0.6 lagging
Load 4	700	0.85 leading

(available 25 kVAr capacitor banks, 1250 L.E. per bank)

[A4, B2] (5 Marks)

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