Reg. No.



VII SEMESTER B.TECH (ELECTRICAL & ELECTRONICS ENGINEERING) MAKEUP EXAMINATIONS, DECEMBER 2017

SUBJECT: POWER SYSTEM OPERATION & CONTROL [ELE 4008]

REVISED CREDIT SYSTEM

Time: 3 Hours	Date: 30 December 2017	Max. Marks: 50
Instructions to Candidates:		

✤ Answer ALL the questions.

• Use of non-programmable scientific calculator is permitted.

1A. For the system shown, determine the inductance of coil 'A' if the current flowing in coil 'A' is I_a and through coil 'F' is I_F





- **1B.** What is the need of stabilization loop in an excitation system?
- 2A. Discuss how the resistance of the transmission line effect the power handling capability of transmission lines. (04)
- **2B.** Draw the voltage and current profile for power system shown below. The voltage is given in p.u.



The lossless AC transmission line is 400km long and has β =0.0013 rad/km. (06)

(06)

(04)

3A.	How do the FACTS controllers provide compensation in transmission lines?	
	Explain.	(05)
3B.	With neat diagram, explain how a capacitor bank provides reactive power compensation.	(05)
4A.	With neat diagram, explain the working of STATCOM.	(06)
4B.	Explain the issues faced with series and shunt compensation of transmission lines.	(04)

- 5A. Formulate the economic dispatch problem for 'N' no. of thermal power plants supplying a total load of 'P_L' through a transmission network. (03)
- 5B. The heat input in MBtu/hr for two thermal generating units is as given below:

$$H_1 = 300 + 8.4 P_1 + 0.0025 P_1^2$$
$$H_2 = 800 + 6.3 P_2 + 0.0081 P_2^2$$

Where, P_n is the unit output in MW with a minimum loading of 40 MW and maximum loading of 300 MW.

The daily load cycle is as follows:

Time Band	Load (MW)
0.00 – 06.00 Hrs	100
06.00 – 18.00 Hrs	500
18.00 – 00.00 Hrs	300

Using lambda iteration method, determine the economic schedule. Also, consider a fuel cost of 1000 Rs/MBtu.

(07)