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B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2017

Sixth Semester

Electrical and Electronics Engineering

EE 6603 – POWER SYSTEM OPERATION AND CONTROL

(Regulations 2013)

Time : Three Hours   Maximum : 100 Marks

Answer ALL questions.

PART – A   (10×2=20 Marks)

1. Define the term Load curve and Load duration curve.

2. What is load forecasting in power system ?

3. What are the types of ALFC for interconnected power system ?

4. Give the two conditions for proper synchronizing of alternators.

5. What is the function of load frequency control ?

6. What are the advantages and disadvantages of synchronous compensators ?

7. What is meant by FLAPC ?

8. Write the condition for the optimal power dispatch in a lossless system.

9. What is SCADA ?

10. Define state estimation.

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PART – B (5×16=80 Marks)

11. a) i) A generating station has following daily load cycle :

Time in Hrs.	0-6	6-10	10-12	12-16	16-20	20-24
Load in MW	40	50	60	50	70	40

Draw the load curve and calculate :
a) Maximum Demand
b) Units generated per day
c) Average load
d) Load factor. (10)

ii) Explain the different types of load forecasting method in a power system operation. (6)

(OR)

b) i) The recorded peak load from 2006 to 2012 of an area are shown below project the load up to 2019 by using Extrapolation method of Exponential curve. (10)

Year	2006	2007	2008	2009	2010	2011	2012
Peak Load (MW)	570	590	740	750	810	890	990

ii) Explain briefly about plant level and system level control of a power system. (6)

12. a) With a neat block diagram, explain the single area load frequency control system with different modules. (16)

(OR)

b) Explain the tie-line bias control of two area system. (16)

13. a) Draw the diagram of a typical Automatic Voltage Regulator (AVR) and develop its block diagram representations. (16)

(OR)

b) Explain the methods of voltage control in a transmission system.
i) By Transformer Tap Changing. (8)
ii) By Booster Transformer. (8)

14. a) State the unit commitment problem. With the help of a flow chart, explain forward dynamic programming solution method of unit commitment problems.   (16)

(OR)

b) The fuel inputs per hour of plants 1 and 2 are given below as :

$F1 = 0.2p1^2 + 40p1 = 120$ Rs./hr.

$F2 = 0.25p2^2 + 30p2 + 150$ Rs./hr.

Determine the economic operating schedule and the corresponding cost of generation. The Maximum and Minimum loading on each unit is 100 MW and 25 MW. Assume that the transmission losses are ignored and the total demand is 180 MW. Also determine the saving obtained if the load is equally shared by both the units.   (16)

15. a) Draw the block diagram to show the hardware configuration of a SCADA for a power system operation and explain the application of SCADA in monitoring and control of power system.   (16)

(OR)

b) Enumerate the various operating states and the control strategies of a power system.   (16)

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