SIDDHARTH GROUP OF INSTITUTIONS :: PUTTUR
Siddharth Nagar, Narayanavanam Road – 517583

QUESTION BANK (DESCRIPTIVE)

Subject with Code : PSOC(**16EE228**) **Course & Branch**: B.Tech - EEE

Year & Sem: IV-B.Tech & I-Sem **Regulation:** R16

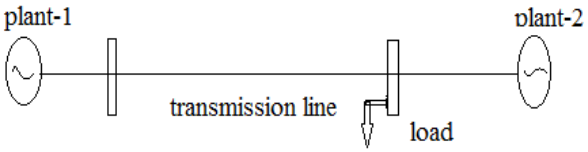
UNIT –I

ECONOMIC OPERATION

1	a	Briefly explain about an incremental fuel cost of thermal power station.	[CO1][L2]4M
	b	The fuel cost of two units are given by, $C_1=1.5+20P_{G1}+0.1P_{G1}^2$ Rs/hr, $C_2=1.9+30P_{G2}+0.1P_{G2}^2$ Rs/hr. If the total demand on the generation is 200MW, find the economic load scheduling of the two units.	[CO1][L3]8M
2		The fuel inputs per hour of plants 1 and 2 are given as $F_1=0.2P_1^2+40P_1+120$ Rs/hr, $F_2=0.25P_2^2+30P_2+150$ Rs/hr. Determine the economic operating schedule and the corresponding cost of generation if the maximum and minimum loading on each unit is 100MW and 25MW, the demand is 180MW, and transmission losses are neglected. If the load is equally shared by both units, determine the saving obtained by loading the units as per equal incremental production cost.	[CO1][L3]12M
3	a	Explain about penalty factor.	[CO1] [L2]4M
	b	A power plant has 3 units with the following characteristics, $F_1=0.05P_1^2+21.5P_1+800$ Rs/hr ,$F_2=0.10P_2^2+27.0P_2+500$Rs/hr, $F3=0.07P_3^2+16.0P_3+900$Rs/hr. $P_{max}=120$MW and $P_{min}=39$MW. Find the optimum scheduling and the total cost per hour for a total load of 200MW.	[CO1] [L3]8M
4		A system consists of two power plants connected by transmission line. The total load located at plant-2 is as shown in figure. Data of evaluating loss coefficients consist of information that a power transfer of 100 MW from station-1 to station-2 results in a total loss of 8 MW. Find the required generation at each station and power received by the load when λ of the system in Rs.100/Mwh. The IFCs of the two plants are given by	[CO1] [L5]12M

$$\frac{dC_1}{dP_{G1}} = 0.12\ P_{G1} + 65\ \text{Rs/MWh.}$$

$$\frac{dC_2}{dP_{G2}} = 0.25\ P_{G2} + 75\ \text{Rs/MWh}$$



When 212.5MW received by the load, find the savings in Rs/hr obtained by co-coordinating the transmission losses rather than neglecting in determining the load division between the plants.

5		Derive and explain the general transmission loss formula.	[CO1][L3]12M
6		The fuel cost curve of two generators are given as $C_1=0.06P_1^2+35P_1+625$ Rs/hr, $C_2=0.05P_2^2+30P_2+175$ Rs/hr. If the total load supplied is 550MW, find the optimal dispatch with and without considering the generator limits: $35MW< P_1<175MW$, $33MW< P_2<600MW$ and also comment about the incremental cost of both cases.	[CO1] [L2]12M
7	a	Define objective function.	[CO1] [L1]2M
	b	Explain about optimum generation allocation with line loss neglected.	[CO1] [L4]10M
8		Develop the loss coefficients formula for a three plant system and power loss equation.	[CO1] [L4]12M
9		Explain about generation allocation including the effect of transmission line loss.	[CO1] [L4]12M
10		(i) Define an incremental efficiency (ii) Write the exact co-ordination equation (iii) List the state variables (iv) Define and draw the production cost (v) Define loss coefficients (vi) Draw input-output characteristics curve	[CO1] [L1]12M

UNIT –II

HYDRO-THERMAL SCHEDULING

1 a With neat figure explain the classification of hydro power plant. [CO2][L2]8M

b What is the necessity of connecting two different plants on same load? [CO2] [L2]4M

2 Derive solution for short term hydro-thermal scheduling using kirchmayer's method. [CO2][L5]12M

3 a Explain about hydro – thermal co-ordination. [CO2] [L2]6M

b The following incremental costs pertain to a 2 plant system. [CO2] [L3]6M

$\frac{dF_1}{dP_1} = 0.03P_1 + 14$ Rs/MWhr

$\frac{dF_2}{dP_2} = 0.04P_2 + 10$ Rs/MWhr

The loss coefficient are $B_{11}=0.001(MW)^{-1}$. $B_{12}=B_{22}=0$. If λ for the system is Rs.30/MWhr compute the required generation at the plants and the loss in the system.

4 a How the problems of scheduling Hydro-thermal power plants are classified? [CO2] [L4]6M

b A system consists of two generators with the following characteristics [CO2] [L3]6M

$F_1=(7P_1+ 0.03P_1^2+70)10^6$

$F_2=(5P_2+0.05P_2^2+100)10^6$

Where F and P are fuel input in K-cal/hr and unit output in MW respectively. The daily load cycle is given as follows,

Time	Load
12 midnight to 6 am	50MW
6 am to 6 pm	150MW
6 pm to 12 midnight	50MW

Give the economic schedule for the three periods of the day.

5 Derive the general mathematical formulation of long term hydro thermal scheduling. [CO2] [L3]12M

6 The incremental production cost data of two plants are $\frac{dF_1}{dP_1} = 2 + P_1$ and $\frac{dF_2}{dP_2} = 1.5 + P_2$ where p1 and p2 are expressed in per unit on 100MVA base. Assume that both the units are in operation and that the maximum loading of [CO2] [L4]12M

each unit is 100MW and the minimum loading of each unit is 10MW. The loss

$$B=\begin{vmatrix} 0.10 & -0.05 \\ -0.05 & 0.2 \end{vmatrix}$$

coefficients on a 100MVA base are given by

For λ=2.5 solve the coordination equations, by the iterative method.

7 Derive the mathematical formulation of hydro-thermal scheduling. [CO2][L3]12M

8 Briefly explain about short term problem in hydrothermal scheduling. [CO2] [L2]12M

9 a What is inter connected grid system? [CO2] [L1]6M

b Consider a steam station with two units the input-output characteristics being specified by $F_1=80+8P_1+0.024P_1^2$ [CO2] [L3]6M

$F_2=120+6P_2+0.04P_2^2$

In scheduling a load of 100MW by equal incremental cost method, the incremental cost of unit 1 is specified wrongly by 10% more than the true value while that of unit 2 is specified by 6% less than the true value

Find (i) The change in generation schedules and

(ii) The change in the total cost of generation.

10 a Explain in detail about long term co-ordination. [CO2] [L3]8M

b Explain about conventional plants in detail [CO2] [L2]4M

UNIT –III

MODELING OF TURBINE AND GOVERNER

1		Explain turbine models for steam power plants with neat diagram.	[CO3] [L2]12M
2	a	Explain the functions of flyball speed governor and hydraulic amplifier in speed governing system.	[CO3] [L2]6M
	b	Discuss about transfer functions of reheat and non – reheat turbine.	[CO3] [L3]6M
3	a	Draw the block diagram of steam turbine and explain it in detail.	[CO3] [L3]6M
	b	A 100 MVA synchronous generator operates on full load at a frequency of 50 Hz. The load is scheduled to 50 MW. Due to time lag in the governor system, the steam valve begins to close after 0.4 seconds. Determine the change in frequency that occurs in this time. M = 5 KW-S/KVA of generator capacity.	[CO3] [L4]6M
4		Two generating stations A and B have full load capacities of 200MW and 75MW respectively. The inter connector connecting the two stations has an induction motor /synchronous generator (plant C) of full load capacity 25MW near station. A percentage changes of speed of A,B and C are 5 ,4 and 3 respectively. The loads on bus bars A and B are 75MW and 30MW respectively. Determine the load taken by the set C and indicate the direction of power flow.	[CO3] [L4]12M
5		Two generator rated 200MW and 400MW are operating in parallel. The droop characteristics of their governors are 4% and 5% respectively from no load to full load. Assuming that the generators are operating at 50HZ at no load, how would a load of 600MW be shared between them? What will be the system frequency at this load? Assume free governor operation. Repeat the problem if the both governors have drop of 4%.	[CO3] [L4]12M
6		What are the parts of speed governor system? Explain each part with neat sketch	[CO3] [L1]12M
7		Derive the mathematical modeling of speed governor system	[CO3] [L3]12M
8		Two turbo alternators rated for 110MW and 210MW, have governor drop characteristics of 5% from no load to full load. They are connected in parallel to share a load of 250MW. Determine the load shared by each machine assuming free governor action.	[CO3] [L2]12M

9	a	Explain about first order turbine model.	[CO3] [L2]7M
	b	Sketch the schematic diagram of speed governor system.	[CO3] [L2]5M
10		Derive and explain the mathematical modeling of speed governing system.	[CO3] [L3]12M

UNIT –IV

LOAD FREQUENCY CONTROL

1		Draw the block diagram representation of a single area system and deduce the expression for the steady state response of the system.	[CO4] [L4]12M
2	a	Why frequency of the power system should be kept constant?	[CO4] [L1]6M
	b	A 500MW generator has a speed regulation of 4%. If the frequency drops by 0.12Hz with an unchanged reference, determine the increase in turbine power. And also find by how much the reference power setting should be changed if the turbine power remain unchanged.	[CO4] [L3]6M
3		The following data is available for an isolated area, capacity 4000MW, frequency 50Hz, operating load 2500MW, speed regulation constant 2Hz/puMW. Intertia constant=5sec. 2% of change in load takes place for 1% change in frequency. Find a) Large change in step load if steady state frequency is not exceed by more than 0.2Hz. b) Change in frequency as a function of time after a step change in load.	[CO4] [L3]12M
4	a	Explain about load frequency control and economic dispatch control.	[CO4] [L2]10M
	b	Define control area.	[CO4] [L3]2M
5		Give typical block diagram for a two-area system inter connected by tie line and explain each block.	[CO4] [L2]12M
6		Two interconnected area 1 and area 2 have the capacity of 2000 and 500MW respectively. The incremental regulation and damping torque coefficient for each area on its own base are 0.2pu and 0.8pu respectively. Find the steady state change in system frequency from a nominal frequency of 50Hz and the change in steady state tie line power following a 750MW change in the load of area 1.	[CO4] [L3]12M
7		Explain the proportional plus integral control for load frequency control of single area system	[CO4] [L2]12M

8	a	Discuss in detail the importance of load frequency control.	[CO4] [L2]6M
	b	Derive the expression for dynamic response of isolated power system under uncontrolled case.	[CO4] [L4]6M
9	a	Explain the multi control area systems.	[CO4] [L2]5M
	b	Two generating units having the capacities 600 and 900MW operating at a 50Hz supply. The system load increases by 150MW when both the generating units are operating at about half of their capacity which results in the frequency falling by 0.5Hz. If the generating units are to share the increased load in proportion to their ratings. What should be the individual speed regulations? What should the regulation to be expressed in PU Hz/ PU MW.	[CO4] [L3]7M
10		Explain about of tie-line bias control with neat sketch.	[CO4] [L2]12M

UNIT –V

REACTIVE POWER CONTROL AND POWER SYSTEM RESTRUCTURING

1	a	Describe about the series compensation in transmission line.	[CO4] [L3]6M
	b	A short transmission line has an impedance of (2+j3) ohms interconnects two power stations, A and B both operating at 11 KV, equal in magnitude and phase. To transfer 25 MW at 0.8 p.f. lagging from A to B determine the voltage boost required at plant A.	[CO4] [L3]6M
2		Explain clearly what do mean by compensation of a transmission line and discuss briefly different methods of compensation.	[CO4] [L2]12M
3		What are the different types of compensating equipment used for transmission systems. Explain all in detail.	[CO4] [L2]12M
4		A load of (15+j10)MVA is supplied with power from a generating station from a line at 110KV 3 phase 50HZ. The line is 100Km length. The line is represented by π model with the parameters- R=26.4ohms, X=33.9ohms, B=$219*10^{-6}$ voltage at the generated in 116KV. Determine the power supplied by the generating station.	[CO4] [L4]12M
5		List the types of reactive power compensation. Briefly describe about load power compensation with necessary equations.	[CO4] [L3]12M
6	a	What are the advantages and disadvantages of different types of compensating equipment for transmission systems?	[CO4] [L2]7M

	b	Explain about static var compensators.	[CO4] [L2]5M
7		Two substation A and B are interconnected by a line having an impedance of (0.03+j0.12)pu the substation voltages are $33<2^0$ KV and $33<0^0$ KV respectively. In phase and quadrature boosters are installed at A. Determine their output-voltage ratings and MVA ratings in order to supply 5MVA at 0.8pf lagging at substation B.	[CO4] [L3]12M
8	a	Distinguish shunt and series compensations.	[CO4] [L2]6M
	b	List the specifications of load compensation.	[CO4] [L1]6M
9	a	Explain the limitations of series compensation.	[CO4[L2]]6M
	b	What is surge impedance loading and also derive the necessary equations	[CO4] [L3]6M
10		(i)What are the sources of reactive power? How it is controlled?	[CO4] [L1]12M
		(ii) What are the effects capacitors in series compensation circuit?	
		(iii) Mention the purpose of series compensation.	
		(iv) Write about synchronous condenser.	
		(v) Define the voltage regulation.	

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UNIT – I

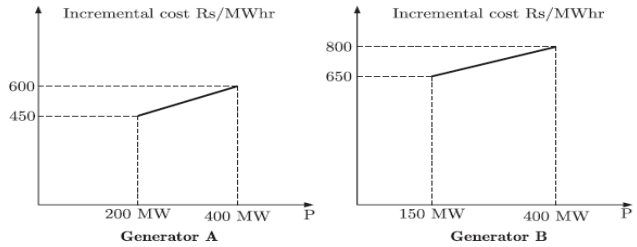
ECONOMIC OPERATION

1.The lossless power system has two generators G1 and G2; and total load to be served is 200 MW. The respective cost curves C1 and C2 are defined as [ ]
$C1 = PGl + 0{\cdot}01\ PG1^2$
$C2 = 5PG2 + 0{\cdot}02\ p\ G2^2$
Assume the minimum loading on any generator to be 30 MW, the most economical loads PG1 and PG2 for the two generators are,
(A) 170 MW and 100 MW (B) 200 MW and 100 MW
(C) 170 MW and 30 MW (D) 200 MW and 30 MW IES 2017

2.The fuel cost of generators $G1$ and $G2$ are : $C1(PG1)$ = 10000 Rs/MWh and $C2(PG2)$ = 12500 Rs/MWh and the loss in the line is $Ploss(pu)\ 0.5PG1^2(pu)$, where the loss coefficient is specified in pu on a 100MVA base. The most economic power generation schedule in MW is [ ]
(A) $PG1 = 20, PG2 = 22$ (B) $PG1 = 22, PG2 = 20$
(C) $PG1 = 20, PG2 = 20$ (D) $PG1 = 0, PG2 = 40$ Gate 2012

3.A loss less power system has to serve a load of 250 MW. There are two generation (G1 and G2) in the system with cost curves $C1$ and $C2$ respectively defined as follows ; [ ]
$C1 = PG1 + 0.055\ PG1^2$
$C2 = 3PG1 + 0.03\ PG2^2$
Where $PG1$ and $PG2$ are the MW injections from generator G1 and G2respectively. Thus, the minimum cost dispatch will be
(A) $PG1 = 250MW; PG2 = 0MW$ (B) $PG1 = 150MW; PG2 = 100MW$
(C) $PG1 = 100MW; PG2 = 150MW$ (D) $PG1 = 0MW; PG2 = 250MW$ Gate 2008

4.The incremental cost curves in Rs/MWhr for two generators supplying a common load of 700 MW are shown in the figures. The maximum and minimum generation limits are also indicated. The optimum generation schedule is : [ ]



(A) Generator A : 400 MW, Generator B : 300 MW
(B) Generator A : 350 MW, Generator B : 350 MW
(C) Generator A : 450 MW, Generator B : 250 MW
(D) Generator A : 425 MW, Generator B : 275 MW Gate2007

5.A load center is at an equidistant from the two thermal generating stations G1 and G2 as shown in the figure. The fuel cost characteristic of the generating stations are given by [ ]
$F1 = a + bP1 + cP1^2$ Rs/hour
$F2 = a + bP2 + 2cP2^2$ Rs/ hour
Where $P1$ and $P2$ are the generation in MW of G1 and G2, respectively. For most economic generation to meet 300 MW of load $P1$ and $P2$ respectively, are
(A) 150, 150 (B) 100, 200 (C) 200, 100 (D) 175, 125 Gate 2005

6. The control variable are [ ]
(A) P_D and Q_D (B) Q and δ (C) V and δ (D) P_G and Q_G.

7. To get an optimal solution to an optimization problem, define an objective function [ ]
(A) $c^* = \sum_{i=1}^{n} C_i (P_{Gi})$. (B) $c^* = \sum_{i=1}^{n} C_i (P_G - \lambda)$.
(C) $c^* = C - \lambda\{\sum_{i=1}^{n}(PGi - PD)\}$ (D) $c^* = \lambda - C\{\sum_{i=1}^{n}(PGi < PD)\}$

8. The curves can be obtained by considering the change in cost of generation to change in real power generation at various points is : [ ]
(A) Fuel cost curve (B) Incremental cost curve (C) Input-output curve (D) All of these

9. Expression for transmission loss is derived using _____ method [ ]
(A) Kron's (B) penalty function (C) kirchmayer's (D) Kuhn-tucker

10. The equality constraint, when the transmission line losses are considered is [ ]
(A) $\sum_{i=1}^{n} PGi - P_L = 0$ (B) $\sum_{i=1}^{n} PGi - P_L = P_D$ (C) $\sum_{i=1}^{n} PGi - P_D = 0$ (D) $\sum_{i=1}^{n} PGi - P_D = P_L + P_G$

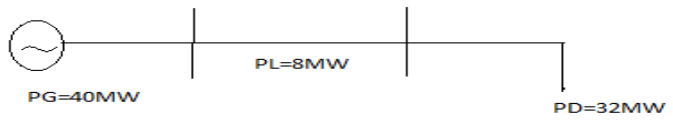
11. Transmission loss by B- coefficient is P_L [ ]
(A) $P^T B$ (B) BP (C) $P^T BP$ (D) all

12. Unit of penalty factor is [ ]
(A) Rs (B) MW^{-1} (C) Rs/MWh (D) no units

13. Transmission loss is [ ]
(A) Independent of real power generation (B)) a function of reactive power generation
(C) A function of bus voltage magnitude (D) a function of real power generation

14. The exact co-ordination equation of the i^{th} plant is [ ]
(A) $\frac{\partial c}{\partial P_g} = [(ITL)-1]$ (B) $\frac{\partial c}{\partial P_g} = \frac{\lambda}{(1-(ITL))}$ (C) $\frac{\partial c}{\partial P_g} = \lambda\,[1-(ITL)]$ (D) $\frac{\partial c}{\partial P_g} = \lambda\,(ITL)$

15. The penalty factor of the plant shown [ ]



(A) 5 (B) 1.25 (C) 12 (D) 8

16. When compared to a hydro-electric plant, the operating cost of the thermal plant is very _____ and its capital cost is _____ [ ]
(A) High, low (B) high , high (C) low, low (D) low, high

17) The input – output characteristic is plotted [ ]
a) Fuel input Vs power output b) Fuel input Vs time
c) Fuel rate Vs power output d) Fuel rate Vs energy output

18) The slope of the cost curve is [ ]
a) $\frac{dC_i}{dt}$ b) $\frac{dC_i}{dP_G}$ c) $\frac{dP_G}{dt}$ d) $\frac{dP_G}{dC_i}$

19) The unit of Lagrangian multiplier λ is [ ]
a) Rs/MW b) MW/Rs c) Rs/MWhr d) MWhr/Rs

20) The fuel cost is meaningful only in case of [ ]
a) Hydro station b) Diesel station
c) Thermal station d) Thermal and nuclear station

21). The unit of Heat rate is [ ]
a) Kcal/MW b) MW/Kcal c) Kcal/MWhr d) MWhr/Kcal

22) The unit of incremental cost of received power (λ) is [ ]
a) Rs / MWhr b) MWhr / Rs c) Rs / MW / hr d) hr / Rs

23) The incremental cost characteristic of the two units in a plant are
IC1 = 0.1 P1 + 8.0 Rs / MWh
IC2 = 0.15 P2 + 3.0 Rs / MWh
Where the total load is 100 MW, the optimum sharing of load is [ ]
a) P1 – 40 MW ; P2 – 60 MW b) P1 – 33.3 MW ; P2 – 66.7 MW
c) P1 – 60 MW ; P2 – 40 MW d) P1 – 66.7 MW ; P2 – 33.3 MW

24) Economic scheduling of generation is performed for a period of [ ]
a) 1/2hr b)24hr c) 1sec d) 1 week

25) The incremental generating costs of two generating units are given by [ ]
IC1 = 0.1 X + 8.0 Rs / MWhr IC2 = 0.15 Y + 3.0 Rs / MWhr
Where X and Y are power (MW) generated by the two units. For a total demand of 100 MW, the value (MW) of X and Y will be respectively [ ]
a) 40 and 60 b) 60 and 40 c) 188 and 172 d) 200 and 100

26) Incremental production cost and incremental fuel are [ ]
a) Both same b) IPC>IFC c)IPC<IFC d) NONE

27) The assumptions made for loss coefficients are [ ]
a) Power factors of plants are equal
b) Current distribution factors are constant
c) Voltage magnitudes at plant buses are equal
d) All the above

28) The Expression of loss for 2 plant system is [ ]
a) $P_L = P_1^2 B_{11} + 2P_1P_2B_{12} + P_2^2 B_{22}$ b) $P_L = P_1^2 B_{11} + 2P_1P_2$
c) $P_L = P_2^2 B_{22}$ d) $P_L = 2P_1P_2 + P_2^2 B_{22}$

29) The unit of Loss coefficients is [ ]
a) Rs/MW b) MW/Rs c) MW d) MW-1

30) The units of current distribution factors is [ ]
a) MW b) Amps c) Volts d) no units

31) The expression for B11 is [ ]

a) $\frac{1}{|V_1^2|(\text{Cos}\varphi_1)^2}\sum_P M_{P1}^2 R_P$ b) $\frac{1}{|V_1^2|(\text{Cos}\varphi_1)^2}\sum_P M_{P1}^2$

c) $\frac{1}{|V_1^2|}\sum_P M_{P1}^2 R_P$ d) $\frac{1}{|V_1^2|(\text{Cos}\varphi_1)^2}\sum_P R_P$

32) Gauss-seidel iterative method can be used for solving a set of [ ]

a) Linear differential equations only b) Linear algebraic equations only

c) Both linear and non linear algebraic equations

d) Both linear and non linear differential equations

33) In terms of power generation and Bmn coefficients, the transmission loss for a two-plant system is [ ]

a) $P_1^2 B_{11} + 2P_1 P_2 B_{12} + P_2^2 B_{22}$ b) $P_1^2 B_{11} - 2P_1 P_2 B_{12} + P_2^2 B_{22}$

c) $P_2^2 B_{11} + 2P_1 P_2 B_{12} + P_1^2 B_{22}$ d) $P_1^2 B_{11} + P_1 P_2 B_{12} + P_2^2 B_{22}$

34) For economic operation, the generator with highest positive incremental transmission loss will operate at [ ]

a) The lowest positive incremental cost of production

b) The lowest negative incremental cost of production

c) The highest positive incremental cost of production

d) None of the above

35) The loss coefficient for two bus system are given as follows: [ ]

a) B11 = 0.02, B22 = 0.05, B12 = 0.01, B21 = 0.015

b) B11 = 0.02, B22 = 0.04, B12 = – 0.01, B21 = 0.001

c) B11 = 0.03, B22 = 0.05, B12 = – 0.01, B21 = – 0.001

d) B11 = 0.03, B22 = 0.05, B12 = 0.001, B21 = – 0.001

36) The solution of coordination equations takes into account [ ]

a) All the system constraints b) All the system and operation constraints

c) All the operational constraints d) None of the above

37) The curve is obtained by considering the change in cost of generation to change in real power generation at various points is [ ]

A) Fuel cost curve B) Input-Output curve C)Incremental cost curve D) All of these

38) In a mathematical determination the optimization problem should be modified as [ ]

A) Constraint optimization problem B) Normalized optimization problem

C) Conditional optimization D) All the above

39) In deriving the expression for transmission power loss, which of the following principle is used? [ ]

A)Thevinins theorem B) Kron's method & superposition theorem

C) Max power transfer theorem D) None

40) The choice of number and size of units in a station are governed by best compromise between [ ]

A) plant load factor and capacity factor B) Plant capacity factor and plant-use factor

C) Plant load factor and use factor D) None of these

UNIT – II

HYDROTHERMAL SCHEDULING

1.Out of the following plant categories [ ]
(i) Nuclear
(ii) Run-of-river
(iii) Pump Storage
(iv) Diesel
The base load power plant are
(A) (i) and (ii) (B) (ii) and (iii) (C) (i), (ii) and (iv) (D) (i), (iii) and (iv) Gate 2009

2.The rated voltage of a 3-phase power system is given as [ ]
(A) rms phase voltage (B) peak phase voltage
(C) rms line to line voltage (D) peak line to line voltage Gate 2004

3.In the thermal power plants, the pressure in the working fluid cycle is developed by [ ]
(A) condenser (B) super heater
(C) feed water pump (D) turbine Gate 2004

4.Total instantaneous power supplied by a 3-phase ac supply to a balanced R-L load is [ ]
(A) zero (B) constant
(C) pulsating with zero average (D) pulsating with the non-zero average Gate 2004

5.For harnessing low variable water heads, the suitable hydraulic turbine with high percentage of reaction and runner adjustable vanes is [ ]
(A) Kaplan (B) Francis (C) Pelton (D) Impeller Gate 2004

6. As far as possible, hydro-plants are used for base-load operation since: [ ]
A)Their capacity cost is high B)Their operation is high
C)Their capital is easy D)Their efficiency is low

7. A thermal plant gives minimum cost per unit of energy generated when used as a [ ]
A)Peak load B)Base-load plant
C)Simultaneously as base-load and peak load D)None of these

8. In the combined operation of steam plant and run-off river plants, the sites of steam plants can be found with the help of_____ [ ]
A)Demand curve B)Input-output curve C)Load curve D)chronological load curve

9. Long-term hydro-thermal co-ordination can be done by: [ ]
A)Plotting the basic rule curve B)Plotting no spill-rule curve
C)Plotting the full reservoir storage curve D)All of these

10._____hydro-thermal co-ordination is done for the available water and is to be used in a given period (24 hours) [ ]
A)Long-term B)Short -term C)Both A and B D)None of these

11. Hydro-thermal co-ordination is necessary only in countries with: [ ]
A)Ample coal resources B)Ample water resources C)Both A and B D)None of these
12. In short-term hydro-thermal co-ordination [ ]
A)No spill-rule curve is used B)spill-rule curve is used
C)Here no rule curve is used due to constraints D)None of these
13. The units of incremental water rate are: [ ]
A)m3/s-MW B)m3-s/MW C)m-s/MW D)m2-s/MW
14. Hydro-generation is a function of: [ ]
A)Water head B)Water discharge C)Water inflow D)Both A and B
15. In the long-term hydro-thermal co-ordination, [ ]
A)Basic rule curve is plotted B) No spill curve C)No full reservoir storage curve D)All of these
16. If the load on an isolated generator is increased with out increasing the power input to the prime mover: [ ]
A)The generator will slow down B)The generator will speed up
C) The generator voltage will increase D)The generator field.
17.Governors of controlling the speed of electric-generating units normally provide [ ]
A)A flat-speed load characteristic B)An increase in seed with an increasing load
C)A decrease in seed with an increasing load D) None
18. If KE reduces [ ]
A) W decreases B) Speed falls C)Frequency reduces D)All
19. Unit of B is [ ]
A)Hz/MVAr B)MVA/Hz C)MW/Hz D)MW-s
20. Units of H of a synchronous machine is: [ ]
A) MJ/MW B)MJ/MVA C)MJ/s D)MW-s
21. KE and frequency of a synchronous machine are related as: [ ]
A) KE=f B)KE=1/f C) KE=f^2 D)None of these
22. Time constant of a power system when compared to a speed governor is: [ ]
A) Less B) More C) Same D) None of these
23. DELTA f of the order of_____Hz [ ]
A) 0 to 0.05 B) -0.05 to 0 C)both A and B D) none of these
24. In a power system _____are continuously changing: [ ]
A) Active and reactive power generation B) Active and reactive power demand
C) Voltage and its angle D) All of these
25. In a normal state, the frequency and voltage are kept at specified values that carefully maintain a balance between: [ ]
A)Real-power demand and real-power generation
B)Reactive power demand and reactive power generation C)Both D) None of these
26. Real-power balance will control the variation in_____ [ ]
A)Voltage B)Frequency C)Both D)None of these
27. The excitation of the generators must be continuously regulated: [ ]
A)To match the reactive power generations with reactive power demand
B)To control the variation in voltage C) Both D) None of these
28._____is the basic control mechanism in the power system. [ ]
A)LFC B)Voltage C)Both D)None of these

29. Setting of speed-load characteristic parallel to itself is known as _____ and its adapted as on-line control [ ]
A)Primary control B) Supplementary control C)Basic D)None of these

30. The degree of unbalance between real-power generation and real-power demand is indicated by the index: [ ]
A)Speed regulation R B)Change in voltage C)Frequency error D)None

31. The control signal that will change the position of the inlet valve of the prime mover is [ ]
A)DELTA Pci B)DELTA Pgi C)DELTA Pdi D)None of these

32 .Laplace transform methods are employed to determine the response of the system in _____ analysis. [ ]
A) Large signal B) Small signal C)Both D) None of these

33. The power generation of a hydro- plant P_{GH} is directly proportional to [ ]
(A) Plant head (B) water discharge (C) both (D) none

34. The units of incremental water rate are [ ]
(A) m^3-s/MW (B) m-s/MW (C) m^2-s/MW (D) m^3/s-MW

35. The cheapest plant in operation and maintenance is..... [ ]
A) Steam power plant B) Nuclear power plant C) Hydro-electric power plant D) None

36. The most simple and keen plant is..... [ ]
A) Nuclear power plant B) Steam power plant C)Hydro-electric power plant D) None

37. Pelton turbines are mostly..... [ ]
A)Horizontal B)Vertical C)Inclined D)None of the above

38. The annual depreciation of a hydro power plant is about..... [ ]
A) 0.5% to 1.5% B)10% to 15% C)15% to 20% D)20% to 25%

39. The power output from a hydro-electric power plant depends on three parameters..... [ ]
A)Head, type and dam of discharge
B)Head, discharge and efficiency of the system
C)Efficiency of the system, type of draft tube and type of turbine used
D)Type of dam, discharge and type of catchment area

40. The running cost of hydro-electric power plant is.....paise per unit [ ]
A)10 B)8 C)5 D)15

UNIT –III

MODELING OF TURBINE AND GOVERNER

1. A power system has two synchronous generators having governor turbine characteristics as Pl =50 (50 -f) P2 = 100 (51-f) [ ]
where f represents the system frequency. Assuming a lossless operation of the complete power system, what is the system frequency for a total load of 800 MW ?
(A) 55·33 HZ (B) 50 HZ (C) 45·33 HZ (D) 40HZ IES 2017

2. At very low temperature, the melting and boiling temperatures become equal. This temperature is [ ]

(a) 373°K (b) 273.16°K (c) 303°K (d) 0°K.

3. The critical pressure at which latent heat of vaporization is zero is [ ]

(a) 225.65 kgf/cm2 (b) 273 kgf/cm2 (c) 100 kgf/cm2 (d) 1 kgf/cm2

4. The latent heat of steam at pressures greater than atmospheric in comparison to latent heat at atmospheric pressure is [ ]

(a) less (b) more (c) equal (d) may be less or more

5. The saturation temperature of steam with increase in pressure increases [ ]

(a) linearly (b) rapidly first and then slowly (c) slowly first and then rapidly (d) inversely

6. Carbonization of coal is the process of [ ]

(a) pulverizing coal in inert atmosphere (b) heating wood in a limited supply of air at temperatures below 300°C (c) strongly heating coal continuously for about 48 hours in the absence of air in a closed vessel (d) binding the pulverized coal into brick-etts

7. Coke is produced by [ ]

(a) Pulverizing coal in inert atmosphere (b) heating wood in a limited supply of air at temperatures below 300GC (c) strongly heating coal continuously for about 48 hours in the absence of air in a closed vessel (d) binding the pulverized coal into brick-etts

8. Heating of dry steam above saturation temperature is known as [ ]

(a) enthalpy (b) superheating (c) super saturation (d) latent heat

9. Super heating of steam is done at [ ]

(a) constant volume (b) constant temperature (c) constant pressure (d) constant entropy

10. 1 kg.m is equal to [ ]

(a) 9.81 Joules (b) All Joules (c) 427 Joules (d) 102 Joules

11. If partial pressure of air and steam be pa and ps respectively in a condenser, then according to Dalton's law, the pressure in condenser is equal to [ ]

(a) Ps-Pa (b) pa-ps (c) Pa+P, (d) none

12. Equivalent evaporation is the amount of water evaporated in a boiler from and at [ ]

(a) 0°C (b) 100°C (c) saturation temperature at given pressure (d) room temperature

13. The specific volume of steam with increase in pressure decreases [ ]

(a) linearly (b) slowly first and then rapidly (c) rapidly first and then slowly (d) inversely

14. The equivalent evaporation of a boiler is a measure to compare [ ]

(a) the given boiler with the model (b) the two different boilers of the same make (c) two different makes of boilers operating under the same operating conditions (d) any type of boilers operating under any conditions.

15. The coal requirement per kW hour generation in the thermal power plant is of the order of [ ]

(a) 0.1 to 0.2 kg (b) 0.2 to 0.4 kg (c) 0.6 to 0.8 kg (d) 1.0 to 1.5 kg

16. Sublimation region is the region where [ ]
(a) solid and vapor phases are in equilibrium (b) solid and liquid phases are in equilibrium (c) liquid and vapor phases are in equilibrium (d) solid, liquid and vapor phases are in equilibrium
17. Stoichiometric quantity of air is the [ ]
(a) air present in atmosphere at NTP conditions (b) air required for complete combustion of fuel with no excess air (c) air required for optimum combustion so as to have reasonable excess air (d) air required to convert CO into C02
18. One kg of steam sample contains 0.8 kg dry steam; it's dryness fraction is [ ]
(a) 0.2 (b) 0.8 (c) 1.0 (d) 0.6
19. If a steam sample is nearly in dry condition, then its dryness fraction can be most accurately determined by [ ]
(a) throttling calorimeter (b) separating calorimeter
(c) combined separating and throttling calorimeter (d) bucket calorimeter
20. At critical point, i.e. p=225.65 kg/cm2, the latent enthalpy of vaporization is [ ]
(a) maximum (b) minimum (c) zero (d) depends on temperature
21. The specific heat of superheated steam in kcal/kg is generally of the order of [ ]
(a) 0.1 (b) 0.3 (c) 0.5 (d) 0.8
22. On Mollier chart, flow through turbine is represented by [ ]
(a) horizontal straight line (b) vertical straight line (c) straight inclined line (d) curved line
23. A wet vapor can be completely specified by [ ]
(a) pressure only (b) temperature only (c) dryness fraction only (d) specific volume only
24. On Millier chart, the constant pressure lines [ ]
(a) diverge from left to right (b) diverge from right to left
(c) are equally spaced throughout (d) first rise up and then fall
25. On Mollier chart, free expansion, or throttling process from high pressure to atmosphere is represented by [ ]
(a) horizontal straight line (b) vertical straight line (c) straight inclined line (d) curved line
26. The bituminous coal is non-caking if its carbon content is [ ]
(a) 78-81% (b) 81-85% (c) 85-90% (d) 90-95%
27. The dry saturated steam at very low pressure, (5-10 kg/cm2) when throttled to atmosphere will become [ ]
(a) wet (b) superheated (c) remain dry saturated (d) dry
28. Water at pressure of 4 kg/cm2 and 160°C temperature when exposed to atmosphere will [ ]
(a) boil (b) flash i.e. get converted into steam (c) remain as it was (d) cool down
29. The dry saturated steam at very high pressure (150-200 kg/cm2) when throttled to atmosphere will become [ ]
(a) wet (b) superheated (c) remain dry saturated (d) dry

30. In a throttling process [ ]
(a) steam temperature remain constant (b) steam pressure remains constant
(c) steam enthalpy remains constant (d) steam entropy remains constant

31. In a throttling process [ ]
(a) heat transfer takes place (b) work is done by the expanding steam
(c) internal energy of steam changes (d) all of the above

32. The pressure at which latent heat of vaporization of water is zero, is [ ]
(a) below atmospheric pressure (b) 1 kg/cm2 (c) 100 kg/cm2 (d) 170 kg/cm2

33. Latent heat of dry steam at atmospheric pressure is equal to [ ]
(a) 539 kcal/kg (b) 539 BTU/lb (c) 427 kcal/kg (d) 100 kcal/kg

34. The latent heat of steam with increase of pressure [ ]
(a) remains same (b) increases (c) decreases (d) behaves unpredictably

35. The heart of the speed governor system,which controls the change in speed is [ ]
A)Linkage mechanism B)Fly-ball speed governor C)Speed changer D)Hydraulic amplifier

36. Linkage mechanism provides: [ ]
A)The moment of control valve in propositional to the inlet steam
B)The feedback from the control valve moment C)Both A and B D)None of these

37. The primary control loop in generator control is: [ ]
A)Linkage mechanism B)fly-Ball governor C)Speed changer D)Hydraulic amplifier

38. Transfer function of reheat type of steam turbine is of_____order [ ]
A)First B)second C) third D) None of these

39. Transfer function of non-reheat type of steam turbine is of_____order [ ]
A)First B)second C) third D) None of these

40. The surplus power (DELTA Pg-DELTA Pd) can be absorbed by a system: [ ]
A)By increasing the stored K.E of the system of the rate d/dt(WkE)
B)By motor loads
C)There is no absorption of surplus power by the system
D)None of these

UNIT – IV

LOAD FREQUENCY CONTROL

1. The methods adopted for improving the steady state stability of power system are [ ]
1. Quick response excitation system
2. Higher excitation voltages
3. Maximum power transfer by use of series capacitor or reactor
(A) 1 and 2 only (B) 1 and 3 only (C) 2 and 3 only (D) 1, 2 and 3 IES 2019

2. A transmission line having Surge Impedance Loading (SIL) of 2280 MW is provided with a uniformly distributed series capacitive compensation of 30%. Then, SIL of the compensated transmission line will be [ ]
(A) 1835 MW (B) 2280 MW (C) 2725 MW (D) 3257 MW Gate 2008

3. An 800 kV transmission line has a maximum power transfer capacity of *P*. If it is operated at 400 kV with the series reactance unchanged, the new maximum power transfer capacity is approximately

(A) *P* (B) 2*P* (C) *P*/2 (D) *P*/4 [ ]

Gate 2005

4. Input signals to an ALFC loop is [ ]

A)$\Delta^{P_{ref}}$ B)Δ^{P_D}

C)Both (a) and (b) D)None of these

5. Two main control loops in generating stations are [ ]

(A)ALFC (B)AVR

(C) Both (a) and (b) (D) None of these

6. The speed regulation can be expressed as [ ]

A)Ratio of change in frequency from no load to full load to the rated frequency of unit

B)Ratio of change in frequency to the corresponding change in real power generation

C) (a) and (b)

D) None of these

7. In an ALFC loop, Δf can be reduced using _____controller [ ]

A)Differential (B)Integral (C)Proportional (D)None of these

8. The basic function of LFC is [ ]

A)To maintain frequency for variations in real-power demand

B) To maintain voltage for variations in reactive power demand

C) To maintain both voltage & frequency for variations in real-power demand

D) To maintain both voltage & frequency for variations in reactive-power demand

9. The LFC system _____in the system [ ]

A) Does consider the reactive power flow (B)Does not consider the reactive power flow

C) Does not consider the real power flow (D) None

10._____Controls the excitation voltage and modifies the excitation [ ]

A) Change in real-power,Δ^{P_a} (B)Change in frequency Δf

C) Change in tie-line power,$\Delta^{P_{tie}}$ (D)Change in reactive power,$\Delta^{Q_{ci}}$

11. The objective of Q-V controller is to transform the [ ]

A) Terminal voltage error signal into a reactive power control signal,$\Delta^{Q_{ci}}$

B) Terminal voltage error signal into a real power control signal,ΔP_{ci}

C) Frequency error signal into a real power control signal,ΔP_{ci}

D) None of these

12. Usually p-f controller and Q-V controller for_____change, can be considered as____[ ]

A)Dynamic, Non-interacting (B)Static, interacting

C) Static, non-interacting (D)None of these

13. AVR loop is _____control mechanism [ ]

A) Slow (B)Faster (C)Slow as well as faster (D)None of these

14.ALFC loop is _____ control mechanism [ ]

A)Slow (B)Faster (C)Slow as well as faster (D)None of these

15. A signal area system is one in which [ ]

A)It is not connected to any other system

B)Total demand on the system should be fully met by its own local generation

C)All generators swing together D)All of these

16. In a signal area system, all generators working remain in synchronism maintaining their Relative power angles; such a group of generators is called [ ]

A)Swing group B)Synchro group C)Coherent group D)None of these

17. In a hydraulic amplifier [ ]

A)High-power-level pilot valve moment is converted into low-power-level main piston movement

B) Low-power pilot valve moment is converted into low-power-level main piston movement

C) Low-power-level pilot valve moment is converted into high-power-level piston movement

D) Low-power-level pilot valve moment is converted into high-power-level pilot valve movement

18. The piston of the pilot valve can be affected through linkage mechanism in_____way [ ]

A)Directly by the speed changer

B)Indirectly through feedback due to position change of the main system

C)Indirectly through feedback due to position changes of linkage point E resulting from a change in speed

D)All of these

19. In reheat type of steam turbine [ ]

A)Steam at high pressure with low temperature is transformed into steam at low pressure with higher temperature

B) Steam at low pressure with higher temperature is transformed into steam at high pressure with Low temperature

C) Steam at low pressure with low temperature is transformed into steam at high pressure with higher temperature

D)None of these

20. The block diagram of the LFC of an isolated power system is of_____model [ ]

A)1ST B)2ND C)3RD D)4TH

21. Changes in load division between AC generators operation in parallel are accomplished by [ ]

A)Adjusting the generator voltage regulators

B)Changing energy input to the prime movers of the generators

C)Lowering the system frequency

D)Increasing the system frequency

22. When the energy input the prime mover of synchronous AC generator operating in parallel With other AC generators is increased, the rotor of generator will be [ ]

A)Increase in average speed B)Retard with respect to the stator-revolving field

C)Advance with respect to stator-revolving field D)None of these

23. When two or systems operate on an interconnected basis,each system: [ ]

A)Can depend on the other system for its reserve requirements

B)Should provide for its own reserve capacity requirements

C)Should operate in a ‘flat frequency’ mode

D)None of these

24. When an interconnected power system operates with a tie-line bias, they will respond to[ ]

A)Frequency changes only B)Both frequency and tie-line load changes

C)Tie-line changes only D)None of these

25. In a two-area case,ACE is: [ ]

A)Change in frequency B)Change in tie-line power

C)Linear combination of both (a) and(b) C)None of the above

26. An extended power system can be divided into a number of LFC areas, which are interconnected by tie lines .Such an operator is called [ ]

A)Pool operation B)Bank operation C)Both (a) and(b) D)None

27. For the static response of a two-area system, [ ]

A)$\Delta P_{ref1}=\Delta P_{ref2}$ B)$\Delta P_{ref1}=0$

C)$\Delta P_{ref2}=0$ D)Both (a) and(b)

28. Area of frequency response characteristic 'β' is: [ ]

A)$\frac{1}{R}$ B)B C)B+$\frac{1}{R}$ D)B-$\frac{1}{R}$

29. The tie-line power equation is $\Delta P_{12}=$ [ ]

A)T($\Delta\delta_1+\Delta\delta_2$) (B)$\frac{T}{(\Delta\delta_1+\Delta\delta_2)}$ (C)$\frac{T}{(\Delta\delta_1-\Delta\delta_2)}$ (D)T($\Delta\delta_1$-$\Delta\delta_2$)

30. The unit of synchronizing coefficients 'T' is: [ ]

A)MW-s (B)MW/s (C)MW-rad (D)MW/rad

31. For a two-area system, Δf is related to increased step load M_1 and M_2 with area frequency response characteristics β_1 and β_2 is: [ ]

A)$\frac{M_1+M_2}{\beta_1+\beta_2}$ (B)$(M_1+M_2)(\beta_1+\beta_2)$ (C)$\frac{-(M_1+M_2)}{\beta_1+\beta_2}$ (D)None of these

32. Tie-line power flow for a two-area system, Δf is related to increased step load M_1 and M_2 with area frequency response characteristics β_1 and β_2 is $\Delta P_{12}=$_____ [ ]

A)$\frac{(\beta_1M_2+\beta_2M_1)}{\beta_1+\beta_2}$ (B)$\frac{(\beta_1M_2-\beta_2M_1)}{\beta_1+\beta_2}$ (C)$\frac{(\beta_1M_1+\beta_2M_2)}{\beta_1+\beta_2}$ (D) None of these

33. Advantage of a pool operation is : [ ]

(A)Added load can be shared by two areas (B)Frequency drop reduces

(C)Both (a) and (b) (D)None of these

34. Damping of frequency oscillations for a two area system is more with [ ]

(A)Low-R (B)High-R (C)R=α (D)None of these

35. ACE equation for a general power system with tie-line bias control is [ ]

(A)$\Delta^{P_{ij}+B_i\Delta f_i}$ (B))$\Delta^{P_{ij}-B_i\Delta f_i}$ (C)$^{\frac{\Delta P_{ij}}{B_i\Delta f_i}}$ (D)None of these

36. For a two-area system Δf,Δ^{P_L}, R_1, R_2 and D are related as Δf=_____ [ ]

(A)$^{\frac{\Delta P_L}{R_1+R_2}}$ (B)$^{\frac{-\Delta P_L}{\frac{1}{R_1}+R_2+B}}$ (C)$^{\frac{-\Delta P_L}{B+R_1+\frac{1}{R_2}}}$ (D)None of these

37. If two areas are identical, then we have: [ ]

(A)$\Delta f_1=^{\frac{1}{\Delta f_2}}$ (B))$\Delta f_1 \Delta f_2 = 2$ (C) $\Delta f_1 = \Delta f_2$ (D)None of these

38. Tie-line between wo areas usually will be a_____line [ ]

(A)HVDC (B)HVAC (C)Normal AC (D)None of these

39.Dynamic response of a two-area system can be represented by a_____order T/F [ ]

(A)3rd (B)2nd (C)1st (D)Zero

40. Control of ALFC loop of a multi-area system is achieved by using_____mathematical technique [ ]

(A)Root locus (B)Bode plots (C)State variable (D)Nyquist plots

UNIT –V

REACTIVE POWER CONTROL AND POWER SYSTEM RESTRUCTURING

1) For a fixed value of complex power flow in a transmission line having a sending end voltage *V*, the real loss will be proportional to [ ]
(A) V (B) V^2 (C)$1/V$ (D) $1/v^2$ GATE 2005

2) The expression for steady state error of speed governing system without PI controller is [ ]

a) $\frac{-1}{B+\frac{1}{R}}$ b) $\frac{-1}{B+\frac{1}{R}}\Delta P_C$ c) $\frac{-1}{B+\frac{1}{R}}\Delta P_D$ d) $\frac{-1}{B+\frac{1}{R}}P_C$

3) The relation among the time constants T_{sg} , T_t and T_{ps} is [ ]

a) $T_{sg} < T_{ps} < T_t$ b) $T_{sg} < T_t < T_{ps}$

c) $T_t < T_{ps} < T_{sg}$ d) $T_{sg} > T_t > T_{ps}$

4) Order of the characteristic equation of load frequency control system is [ ]

a) 1 b) 3
c) 2 d) 4

5) The Dynamic response of first order approximation of speed governing system is [ ]

a) $\frac{-RK_{PS}}{R+K_{PS}}$ b) $\frac{-RK_{PS}}{R+K_{PS}}\Delta P_D$

c) $\frac{-RK_{PS}}{R+K_{PS}}\left\{1-e^{-t}\right\}\Delta P_D$ d) $\frac{-RK_{PS}}{R+K_{PS}}\left\{1-e^{\left[-\frac{t}{T_{PS}}\left(\frac{R}{R+K_{PS}}\right)\right]}\right\}\Delta P_D$

6) When PI controller added to speed governing system, the order of the system [ ]
a) Increases by one b) Decreases by one c) Increases by two d) Decreases by two

7) Write the damping coefficient formula?
a) $B=\frac{\partial P_d}{\partial f}\ MW/HZ$ b) $B=\frac{\partial P_d}{\partial f}\ KW/\sec$ c) $B=\frac{\partial P_d}{H}\ MW/HZ$ d) None

8) Single control area fitted with proportional plus integral controller is [ ]
a) Is synchronous and unstable b) Is synchronous and stable
c) Non synchronous and unstable d) Non synchronous and stable

9) In two area system area control error at area1, is related with Δf static and ΔP tie line as _____ [ ]
a) Δf static + ΔP tie line b) ΔP static tie line tb system
c) ΔP tie line – b, Δf static d) none

10) Units of synchronization co-efficient _____ [ ]
a) MW/rad b) rad/MW c) MW/H2 d) none

11) A synchronous capacitor can supply [ ]
a) Lagging VARs only b) Leading VARs only
c) Both lagging and leading VARs d) neither leading nor lagging VARs

12) A power system needs injection of VARs [ ]
a) At peak load b) neither peak nor off peak load
c) Both at peak load and off peak load d) at off peak load

13) The injection of reactive power is needed [ ]
a) To increase the voltage at the receiving end
b) To get a good voltage profile
c) To compensate for line losses
d) To supply a part of active power requirements of the load

14) For a good voltage profile under load condition a long line needs [ ]
a) Shunt capacitors at receiving end
b) Shunt reactors at receiving end
c) Shunt resistance at receiving end
d) Both shunt capacitor and reactor at receiving end

15) Phase modifier normally installed in the case of [ ]
a) Short transmission lines
b) Medium transmission lines
c) Long transmission lines
d) For all type of transmission lines

16) What is the main objective of the load compensation [ ]
a) Better voltage profile b) p.f. correction c) load balancing d) all of the above

17) Synchronous motor can be operated at [ ]
a) Lagging p.f.only b) Leading p.f. only c) Unity p.f. only d) All of the above

18) An under excited synchronous generator operates at [ ]
a) Lagging p.f. b) Leading p.f. c) Unity p.f. d) All of the above

19) Voltage response of an exciter expressed as [ ]
a) volt/sec b) volt/amp c) fields amps/ output amps d) change in field voltage

20) In VAR compensators using thyristors [ ]

a) Filters are not necessary b) filters are need for fifth and seventh harmonic
c) Capacitors are switched on the HV side only d) none

21) What are the three components of a modern electrical system? [ ]
a) Generation, Transmission and Distribution
b) Production, Filtration and Distribution
c) Generation, Filtration and Distribution
d) Production, Transmission and Recycling

22) What are the entities and organizations which tend to dominate the industry? [ ]
a) Investor-Owned Utilities and publicly-owned utilities
b) Federal agencies and rural electric cooperatives
c) Power marketers
d) All of the above

23) What are some characteristics of investor-owned utilities (IOU)? [ ]
a) IOUs are private, shareholder-owned companies
b) IOUs range in size from small companies to multi-national corporations
c) Most IOUs are regulated through state public utility commissions
d) All of the above

24) How are Local, municipal, state and regional public power systems regulated by their respective governments? [ ]
a) A state's public utility commission will always regulate these public power systems
b) A state's public power system will always be regulated by local government
c) A special state authority will always have jurisdiction to regulate the public power systems of their respective states
d) None of the above

25) ISO stands for [ ]
a) Independent Source of Organization
b) Independent System Operator
c) Independent System of Organization
d) Independent Source of Organization

26) PURPA stands for [ ]
a) Public Utilization of Regulatory Act
b) Public Utilization of Regular Act
c) Public Utilities Regulatory Act
d) Private Utilities Regulatory Act

27) What is NEPA? [ ]
a) National Energy Policy Act
b) National Energies Policy Act
c) Nationalized Energy Policy Act
d) National Energy Systems Policy Act

28) What is IPP? [ ]
a) Independent Power Planners
b) Independent Power Producers
c) Independent Power Players
d) Independent Power Participants

29) FERC stands for [ ]
a) Foreign Energy Regulatory Corporation
b) Foreign Energy Regulatory Commission
c) Federal Energy Regulatory Commission
d) Federal Energy Regulatory Corporation

30) Which of the following are reasons for restructuring? [ ]

a) Electricity price will go down
b) Choice for customers
c) Customer-centric service and Innovation
d) All of the above

31) What is Resco? [ ]
a) Retail Energy Service Company
b) Retail Energy Server Company
c) Retail Energetic Service Company
d) Retail Energetic Server Company

32) Discom stands for [ ]
a) Distribution corporation
b) Distribution company
c) Distributed corporation
d) Distributed company

33) Transco stands for [ ]
a) Transmission corporation
b) Transmission companies
c) Transmission company
d) Transmission companion

34) What is LMP? [ ]
a) Location Margin Price
b) Locational Marginal Pricing
c) Locational Margin Price
d) Location Marginal Pricing

35) OPF stands for [ ]
a) Optimal Power Flow
b) Optimized Power Flow
c) Optimized Active Power Flow
d) Optimized Reactive Power Flow

36) What is ABT? [ ]
a) Available Based Tariff
b) Availability Basics Tariff
c) Availability Based Tariff
d) Available Basic Tariff

37) ATC stands for [ ]
a) Availability Transfer capacity
b) Available Transfer Capability
c) Available Transfer Capacity
d) Availability Transfer Capability

38) Which of the following limit causes congestion in Transmission Lines? [ ]
a) Exceeding Thermal Limit of Transmission Line
b) Exceeding Voltage Limit of Transmission Line
c) Exceeding Stability Limit of Transmission Line
d) All of the above

39) Which of the following are desires of Congestion Management? [ ]
a) Economic Efficiency
b) Non-Discriminative Access
c) Transparent and Robust
d) All of the above

40) MCP stands for [ ]

a) Market Clearing Price
b) Market Cleared Pricing
c) Marketed Clearing Price
d) Market Cleared Price

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