



S J P N Trust's

Hirasugar Institute of Technology, Nidasoshi.

Inculcating Values, Promoting Prosperity

Approved by AICTE, Recognized by Govt. of Karnataka and Affiliated to VTU Belagavi

EEE

Exam.

Internal Assessment

Even Sem(2017-18)

FIRST INTERNAL ASSESSMENT

Sem: IV
Date: 05/03/2018

Sub: Power Generation and Economics
Time: 3PM to 4PM

Sub. Code: 15EE42
Max. Marks: 25

Note: Answer two full questions, draw sketches wherever necessary.

Q. No	Discription of Question	Marks	CO	RBT Level
1	a Define i. Hydrograph ii. Flow duration curve iii. Mass curve.	6	310.1	L1, L2
	b Mention merits and demerits of Hydroelectric power plants.	6	310.1	L1, L2
OR				
2	a Explain the factors to be considered for selection of site for hydroelectric power plant.	6	310.1	L1, L2
	b Explain the classification of Hydroelectric power plants based on water flow regulation.	6	310.1	L1, L2
3	a Explain the procedure for selection of water turbines	6	310.1	L1, L2
	b Explain the operation of pumped storage plant and mention the merits and demerits of plant.	7	310.1	L1, L2
OR				
4	a With neat sketch explain the working of Pelton wheel turbine.	6	310.1	L1, L2
	b Define governing of turbine and explain the operation of oil pressure governor with neat sketch.	7	310.1	L1, L2


Course Coordinator


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SCHEME OF EVALUATION

Sem : 4 th	Subject : Power generation & Economics	Sub Code : 15EE42	Date : 05/03/18	Marks	CO's
Q. No.	Q. No.	Description			
1	a	definition of Hydrograph + Flow duration curve and MASS curve Graph of above all	03	310.1	
			03		
	b	merits and demerits of Hydroelectric power plant	06	310.1	
2	a	Explanation for factors to be considered for selection of site of Hydroelectric power plant	06	310.1	
	b	classification of Hydroelectric power plants	06	310.1	
3	a	procedure for selection of water turbine	06	310.1	
	b	With neat sketch operation of plant merits and demerits of plant	03 04	310.1	
4	a	neat sketch + working of pelton wheel turbine	06	310.1	
	b	definition of governing of turbine neat sketch of oil pressure governor explanation for oil pressure governor	01 03 03	310.1	


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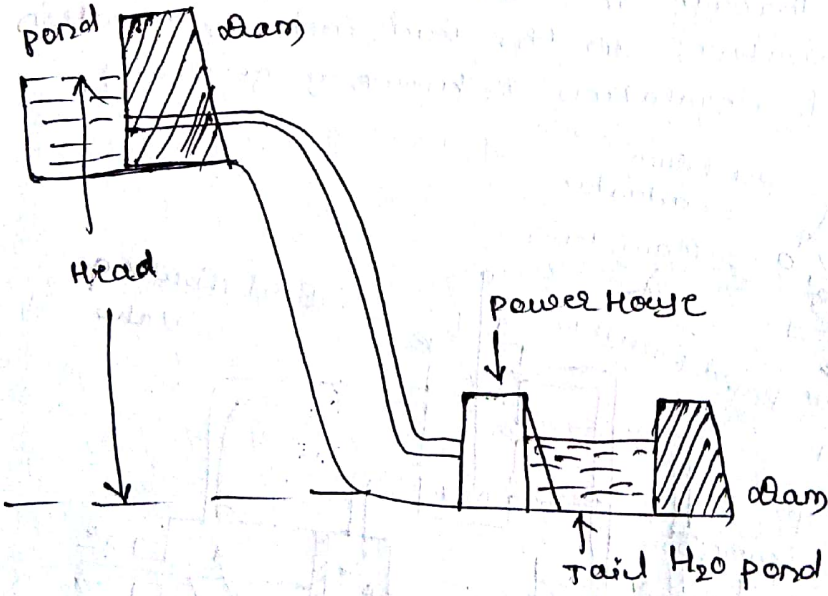

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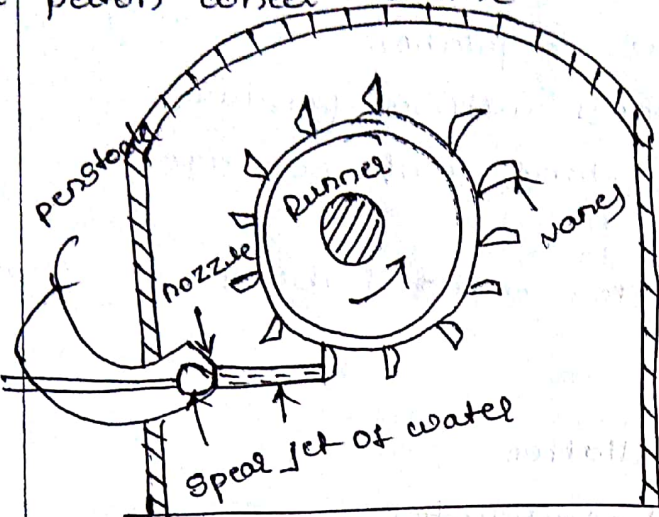
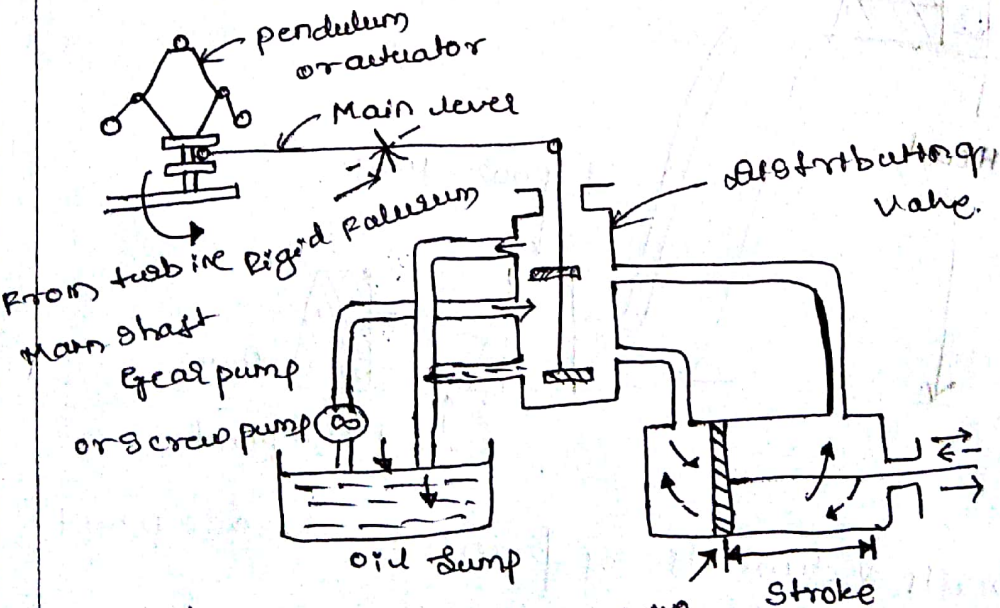
SCHEME OF EVALUATION

Sem: 4 th	Subject: Power Generation & Economics	Sub Code: 15EE42	Date: 05/03/18
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Q.No.	Bit	Description	Marks	CO's
2	b	<p>Classification of hydroelectric power plant based on water flow regulation.</p> <p>i) Run-off river plants without pondage ii) Run-off river plants with pondage iii) Reservoir plants</p>	06	3,10,1
3	a	<p>Selection procedure for water turbine</p> <p>① operating head ② specific speed ③ Height of installation ④ performance characteristics ⑤ size of turbine</p>	06	3,10,1
	b	<p>pumped storage power plant</p>  <p>merits & demerits of pumped storage plant</p>	07	3,10,1



SCHEME OF EVALUATION

Sem : 4 th	Subject : Power Generation & Economics	Sub Code : 15EE92	Date : 05/03/18	Marks	CO's
Q. No.	Bit	Description			
4.	a	<p>pelton wheel turbine</p> 	06	3, 10.1	
	b	<p>The turbine runner speed is to be maintained constant by regulating the flow of water passing through the runner in accordance with variation in the load. Such an operation of speed regulation is known as governing.</p> 	07	5, 10.1	



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Exam.

Internal Assessment

Even Sem(2017-18)

Sem:IV
Date: 11.04.2018

SECOND INTERNAL ASSESSMENT

Sub: Power Generation and Economics
Time: 3PM to 4PM

Sub. Code: 15EEA2
Max. Marks: 25

Note: Answer two full questions, draw sketches wherever necessary.

Q. No	Description of Question	Marks	CO	RBT Level
1	a Explain the working of steam power plant with neat schematic diagram.	6	310.2	L2
	b Explain handling of Ash & dust collection in steam power plant.	6	310.2	L2
OR				
2	a Explain the various elements of diesel power plant.	6	310.2	L2
	b With neat sketch explain the operation of closed cycle gas turbine power plant.	6	310.2	L2
3	a Mention merits and demerits of Nuclear power plant.	6	310.3	L2
	b Mention classification of Nuclear reactors & with neat sketch explain the operation of Pressurized water reactor(PWR).	7	310.3	L2
OR				
4	a Explain the disposal of Nuclear waste & Effluents in Nuclear power plant	6	310.3	L2
	b Define Nuclear power plant & with neat sketch explain the operation of Nuclear power plant.	7	310.3	L2


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SCHEME OF EVALUATION

Sem : 4 th	Subject : Power generation & Economics	Sub Code : 15EE42	Date : 11/04/18	Marks	CO's
Q. No.	Bit	Description			
1.	a.	neat sketch of steam power plant	02	310.2	
		Explanation of working of steam power plant	04		
	b.	Explanation for Ash handling & dust collection in steam power plant	03 03	310.2	
2.	a.	Explanation for various elements of diesel power plant	06	310.2	
	b.	neat sketch closed cycle gas turbine plant	03	310.2	
		Explanation for gas turbine plant	03		
3.	a.	merits & demerits of Nuclear power plant	06	310.3	
	b.	classification of Nuclear reactor	02	310.3	
		Neat sketch of PWR + operation of PWR	05		
4.	a.	Explanation for disposal of Nuclear waste & effluents	06	310.3	
	b.	definition of Nuclear power plant	01	310.7	
		neat sketch of power plant + operation	06		

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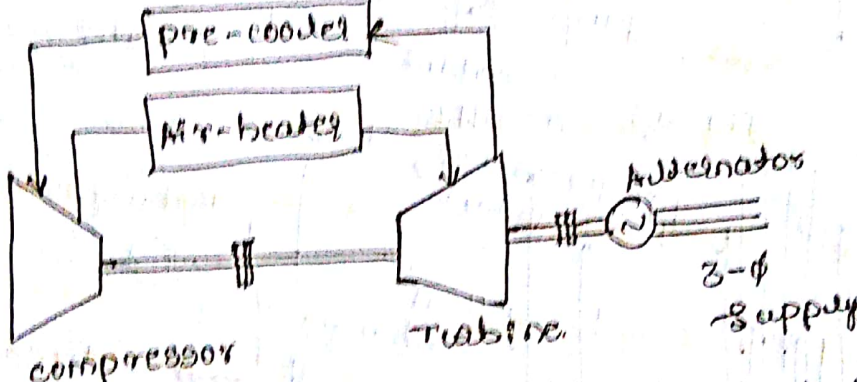


SCHEME OF EVALUATION

Q. No.	Bit	Description	Date: 01/04/18	Marks	CO's
1.	a)	<p>neat sketch of steam power plant</p> <p>fig - steam power plant</p>		02 Marks	310.2
		<p>explanation for working of steam power plant</p>		04	
	b.	<p>Ash handling & dust collection explanation</p> <p>→ In large power plant ash amounts for 1 to 20% of the coal burnt. Handling of ash is a problem because ash coming out of the furnace is i) too hot ii) density iii) it produces poisonous gaseous & corrosive acid.</p> <p>There are 4 groups of ash handling</p> <p>① Mechanical handling slm. ④ steam jet slm ② Hydraulic slm ③ pneumatic slm</p> <p>dust is defined as a solid matter in flue gas which is more than 0.004m & less than 0.01 mm ID diameter.</p>		06	310.2



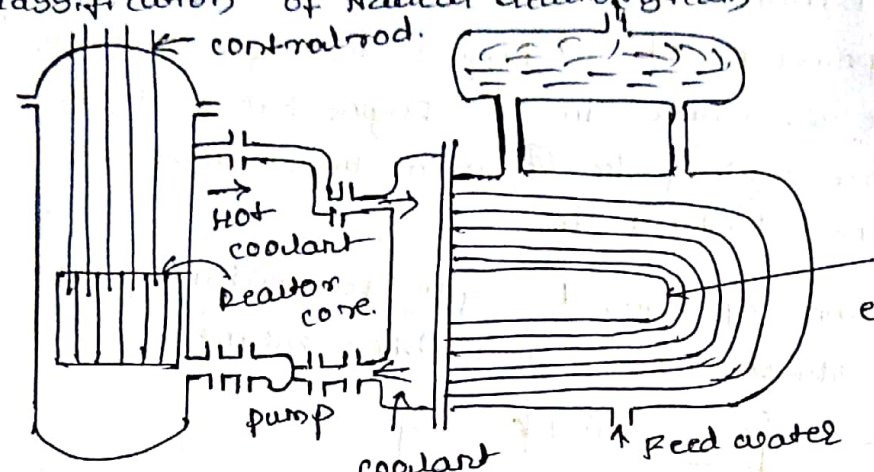
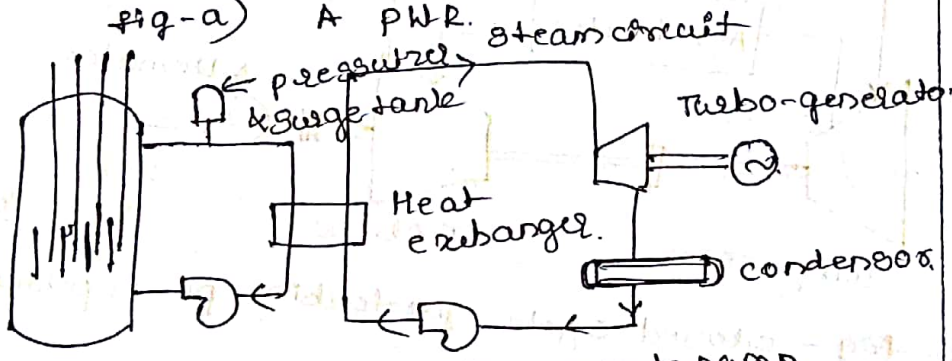
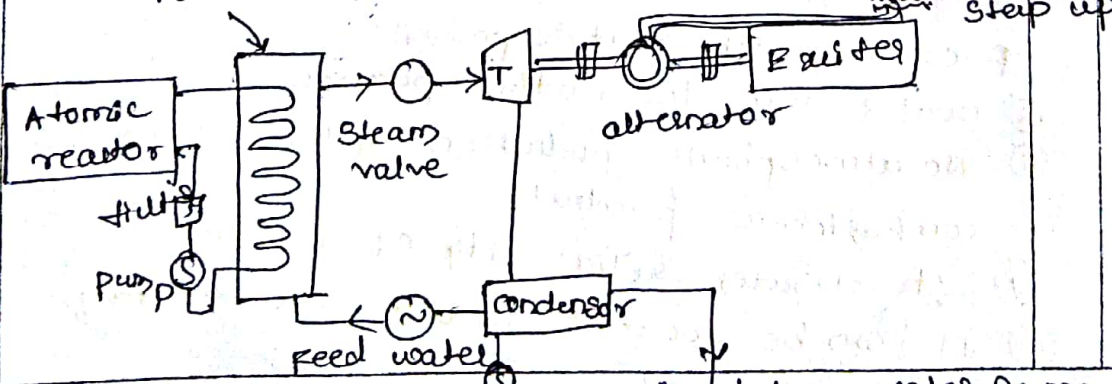
SCHEME OF EVALUATION

Sem: III	Subject: power Generation & Economics	Sub Code: 15EE42	Date: 11/04/17	Marks	CO's
Q. No.	Description				
2.	a.	Explanation for various elements elements of diesel power plant - 1) Engine 2) Engine fuel s/m 3) Engine air intake s/m 4) Engine Exhaust s/m 5) Engine cooling s/m 6) Engine lubricating s/m 7) Engine starting s/m		08	310.2.
	b.	operation of closed cycle gas turbine plant neat sketch of gas turbine plant		03 03	310.2.
		 <p>fig - closed cycle gas turbine power plant</p>			
3.	a.	merits of nuclear power plant 1) The amount of fuel required is quite low. 2) It requires less space, 3) It has low running charges. 4) This type of plant is economical for producing the electric power. 5) neat & clean than other plants. 6) No atmospheric pollution as there is no combustible products. 7) It ensures reliability of operation 8) It can be located near to load centre.		08	310.3



SCHEME OF EVALUATION

Sem : 4th Subject : power generation & Economy Sub Code : 15PE42 Date :

Q. No.	Bit	Description	Marks	CO's
3.	b	Classification of Nuclear Reactor  <p>Fig-a) A PWR.</p>	02	
		 <p>Fig-b) Line arrangement of a PWR with heat exchanger in the circuit.</p>	02 + 03	
4.	a)	Explanation for disposal of Nuclear waste	06.	310.3
	b.	definition of Nuclear power plant Heat exchanger	01	
				

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Exam.

Internal Assessment

Even Sem(2017-18)

THIRD INTERNAL ASSESSMENTSem:IV
Date: 18.05.2018Sub: Power Generation and Economics
Time: 3PM to 4PMSub. Code: 15EE42
Max. Marks: 25*Note: Answer two full questions, draw sketches wherever necessary.*

Q. No	Discription of Question	Marks	CO	RBT Level
1	a Explain the classification of substation based on purpose.	6	310.4	L2
	b With neat sketch explain the resistance Grounding.	6	310.4	L2
OR				
2	a Explain single bus scheme with & without sectionalizer.	6	310.4	L2
	b Explain the function of protective relay, circuit breaker & Lightning arrestor in substation.	6	310.4	L2
3	a Define Depreciation & determine the value of Depreciation by straight line method	7	310.5	L4
	b Explain two part tariff, power factor tariff & maximum demand tariff.	6	310.5	L4
OR				
4	a Mention various methods of power factor improvement & show improvement of power factor in single phase circuits by using static capacitors.	6	310.5	L4
	b A generating station has a maximum demand of 25MW, a load factor of 60%, a plant capacity factor of 50% and a plant use factor of 72% Find (1) the reserve capacity of the plant (2) The daily energy produced (3) Maximum energy that could be Produced daily if the plant while running as per schedule were fully loaded.	7	310.5	L4

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E&E Engg Dept
Exam
IA Scheme
2017-18 Even Sem

Page No.: 01/04

SCHEME OF EVALUATION

Sem : 4 th		Subject : power Generation & Economics	Sub Code : 15EE42	Date : 18/5/18	Marks	CO's
Q. No.	Bit	Description				
1	a	Explanation for classification of Substation based on purpose			06	310.4
	b	neat sketch for resistance grounding			02	310.4
		Explanation for it			04	
2	a	<u>OR</u> neat sketch of single bus scheme with & without sectionalizer & explanation			03 03	310.4
	b	Explanation for functions of protection relay, circuit breaker & lightning arrester			06	310.4
3	a	definition of depreciation + determination of depreciation by straight line method			01 + 06	310.5
	b	definition of two part tariff, power factor tariff & maximum demand tariff with formula			06	310.5
4	a	<u>OR</u> various methods of power factor improvement improvement of power factor in 1- ϕ circuit by using static capacitors			04 + 05	310.5
	b	For the given problem calculation of all mentioned parameters			07	310.5

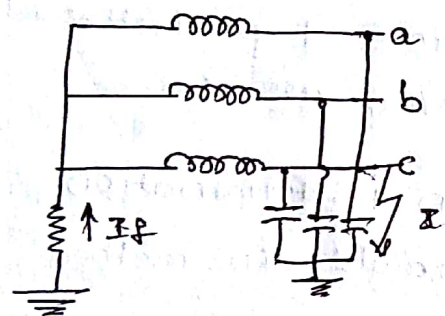
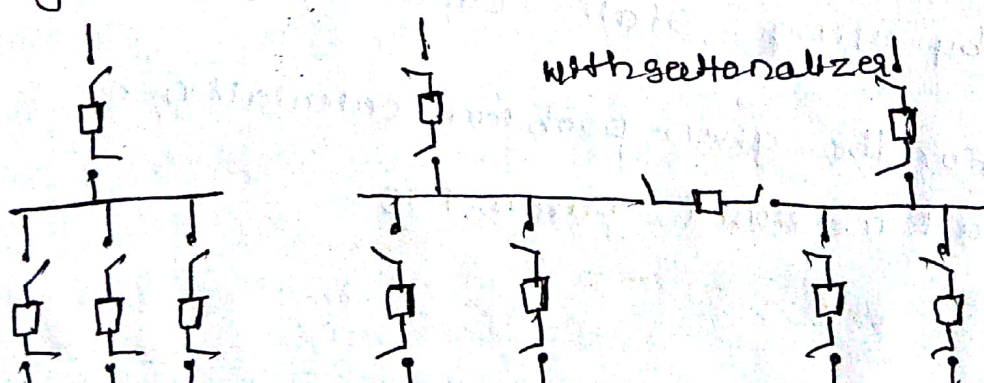
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SCHEME OF EVALUATION

Sem: 4 th		Subject: Power Generation & Economics	Sub Code: 16EE42	Date: 18/5/18	Marks	CO's
Q. No.	Bit	Description				
1	a.	classification of substation with explanation based on purpose ① generating substations or step up substation ② grid substation ③ secondary substation ④ distribution substation ⑤ special purpose substation.			06	310.4
	b.	Resistance grounding  <p>fig - Resistance grounding</p> <p>peterson gave formula for resistor</p> $R = (2.0 \text{ to } 1.35) \sqrt{ca + cb + cc}$ <p>where ca, cb, cc are capacitance of each phase to earth</p>			06	310.4
		<u>OR</u>				
2	a.	single bus scheme with & without sectionalizer 			06	310.4



SCHEME OF EVALUATION

Sem : 4 th	Subject : Power Generation & Economics	Sub Code : 15EE42	Date : 18/5/18	Marks	CO's
Q. No.	Blk	Description			
2	b	Explanation for protective relay, CB & Lightning arrestor		06	310.5
3.	a	<p>definition of depreciation → The decrease in the value of building & equipment due to constant use is known as depreciation</p> <p> $\text{depreciation} = \frac{P - S}{n}$ where P is initial cost of equipment $n = \text{useful life of equipment in years}$ $S = \text{Scrap value, after}$ </p> <p>the useful life of plant.</p>		01	
	b.	<p><u>Two-part tariff</u> → When the rate of electricity charged is based on the maximum demand of the consumer & the no of units consumed is known as two part tariff</p> <p><u>power factor tariff</u> → The tariff in which power factor of the consumer load is taken into consideration is known as power factor tariff.</p> <p><u>Maximum demand tariff</u> → It is similar to the two part tariff except that in this case Max demand is actually measured by max demand indicator instead of assessing it on the basis of reliable value.</p>		06	310.5

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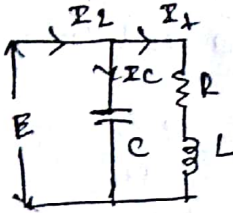
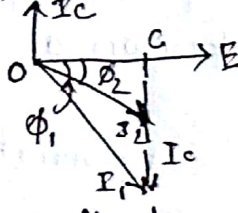
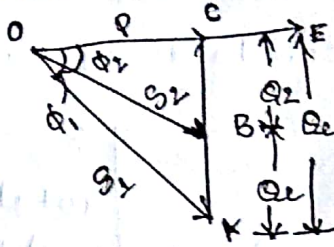
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SCHEME OF EVALUATION

Sem: 4th Subject: Power Generation & Economy Sub Code: 15EE42 Date: 18/5/18.

Q. No.	Bit	Description	Marks	CO's
4	a	<p>Method of improving power factor.</p> <ol style="list-style-type: none"> ① By using static capacitor ② By using synchronous condenser ③ By using phase advancer ④ By using phase compensated motor.  <p>Fig-a</p>  <p>Fig-b</p>  <p>Fig-c</p> <p>Final value is $G = I_c / \omega E$</p>	01	3, 10, 5
4.	b	<p>Given parameters. Maximum demand 25 MW, load factor = 60%, plant capacity factor = 50%, plant use factor = 72%.</p> <p>Average demand = $25 \times 0.60 = 15 \text{ MW}$.</p> <p>Reserve capacity of plant = plant capacity - Max demand $= 30 - 25 = 5 \text{ MW}$.</p> <p>Daily energy produced = Average demand $\times 24$ $= 15 \times 24$ $= 360 \text{ MWh}$.</p> <p>Maximum energy that could be produced daily = $\frac{\text{Actual energy produced in a day}}{\text{plant use factor}}$ $= \frac{360}{0.72} = 500 \text{ MWh/day}$.</p>	07	3, 10, 5

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