

**APJ ABDULKALAM TECHNOLOGICAL UNIVERSITY
08 PALAKKAD CLUSTER**

Q. P. Code :ES0819012-I

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Name:

Reg. No:.....

SECOND SEMESTER M.TECH. DEGREE EXAMINATION JUNE 2019

Branch: Electrical and electronics Engineering

Specialization: Energy systems

08EE6012 DESIGN AND ANALYSIS OF ENERGY SYSTEM

Time:3 hours

Max.marks: 60

Answer all six questions.

Modules 1 to 6:Part 'a' of each question is compulsory and answer either part 'b' or part 'c' of each question.

Q.no.	Module 1	Marks
1.a	What are the steps to design a workable system	3
Answer b or c		
b	What is engineering design.? With the help of a flow chart explain each steps associated with it	6
c	The design system of a cooling system for a personal computer requires a fan .Three manufactures are willing to provide a fan with the given specifications a) Fan A is set at 63rs payable immediately at the delivery b) Fan B requires two payments of 42rs each at the end of first and second year after delivery c) Fan C requires a payments of 65 Rs. At the end of two years after delivery Consider 3 interest rates 6% ,8% and 10% which fan is the best one	6
Q.no.	Module 2	Marks
2.a	What is the function of heat exchangers in an energy system with neat sketch	3
Answer b or c		
b	Explain the design of a condensers in detail	6
c	Explain with the help of neat sketches then design of evaporators	6
Q.no.	Module 3	Marks
3.a	Derive the expression for form factor of a single phase bridge rectifier	3

Answer b or c

b For the given data find out the performance parameters **6**

1.range 2.approach 3.evaporation loss 4.blow down loss 5. Total water requirement per day inlet water temperature =44degreecelc outlet water temperature =32 degree cel

Wet bulb temperature =28 degree cel cycles of concentration =3 water circulation rate is given as 120 m3/hr drift losses =0.2 %

c Explain with neat sketches the various parts of cooling towers **6**

Q.no. **Module 4** **Marks**

4.a Give any three manufactures specification of pumps in detail **3**

Answer b or c

b Explain various characteristics of pumps in detail **6**

c Explain the pump system operation in detail **6**

Q.no. **Module 5** **Marks**

5.a What are the effects of cavitation ? How can we avoid cavitation **4**

Answer b or c

b A Kaplan turbine operation at a net head of 6m develops 3350 KW power with an overall efficiency of 88%.The draft tube of inlet diameter 2,8 having an efficiency of is to be attached to the turbine unit. From cavitation considerations ,the pressure head at the entry to the draft tube is must not drop more than 5.5 m below atmosphere .Calculate the maximum height at which the runner may be set above the tail race **8**

c Explain in detail the various types of fans and their construction **8**

Q.no. **Module 6** **Marks**

6.a What is second law of thermodynamics **4**

Answer b or c

b Explain Hardy cross method in detail **8**

c Explain Newton Raphson simulation method in detail **8**