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10ME53

Fifth Semester B.E. Degree Examination, Dec.2016/Jan.2017

**Energy Engineering**

Time: 3 hrs.

Max. Marks:100

**Note: Answer any FIVE full questions, selecting atleast TWO questions from each part.****PART – A**

- 1 a. Explain Cyclone burner, along with proper sketch. (06 Marks)  
b. Explain various coal handling techniques. (08 Marks)  
c. Prepare a neat sketch for hydraulic ash handling system and explain. (06 Marks)
- 2 a. Give a neat sketch for Benson boiler and write the operating principle. (08 Marks)  
b. Explain briefly about i) Economiser ii) Air preheater. (06 Marks)  
c. Derive an expression for chimney height. (06 Marks)
- 3 a. Write the advantages and disadvantages of diesel power plant. (06 Marks)  
b. Explain with neat sketch, Individual pump injection system and common rail injection system in diesel power plant. (08 Marks)  
c. What is meant by thermostat cooling in diesel power plants? (06 Marks)
- 4 a. Give a brief note on i) Hydrograph ii) Flow duration curve. (06 Marks)  
b. Draw a general layout of hydro – electric power plant and explain the functions of each part. (08 Marks)  
c. Explain briefly about : i) Water hammer effect ii) Surge tank. (06 Marks)

**PART – B**

- 5 a. Explain with neat sketch, the layout of nuclear power plant. (08 Marks)  
b. State the functions of moderator, control rods and reflector. (06 Marks)  
c. Explain with neat sketch, the working of pressurized water reactor. (06 Marks)
- 6 a. Explain with proper sketch, about solar P-V conversion system. (06 Marks)  
b. Give a brief note on horizontal and vertical axis wind mill system. (06 Marks)  
c. The incident beam of sunlight has a power density of  $1 \text{ kW/m}^2$  in the direction of beam. The angle of inclination is  $60^\circ$ . Calculate the power collected by the surface, having a total flat area of  $120\text{m}^2$ . (08 Marks)
- 7 a. Give a short note on tidal power plant. (06 Marks)  
b. Explain briefly about OTEC plants. (08 Marks)  
c. What is meant by Geothermal energy conversion? (06 Marks)
- 8 a. What are the stages in anaerobic digestion process? Explain. (06 Marks)  
b. With neat sketch, explain the working of floating type digester. (08 Marks)  
c. What are the factors affecting the generation of biogas in a digester? (06 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and /or equations written eg,  $42+8=50$ , will be treated as malpractice.