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IV SEMESTER B.TECH (Open Elective - I)

END SEMESTER EXAMINATIONS, APRIL/MAY 2017

SUBJECT: Energy Engineering (MME 3282)

REVISED CREDIT SYSTEM

Time: 3 Hours

MAX. MARKS: 50

Instructions to Candidates:

- ✤ Answer ALL the questions.
- Missing data if any may be suitably assumed.
- 1A) Draw a neat sketch of Benson Boiler and mention the unique features of the high (03) pressure boilers.
- 1B) With neat sketch differentiate the working of Supercharged and Turbo charged (03) engine.
- **1C)** Draw a layout of steam power plant and briefly explain the different circuits **(04)** involved in the system.
- 2A) With neat sketch explain the working of diesel engine power plant. (03)
- 300 MW of electrical power is required for a city. If this is to be supplied by a (03) nuclear reactor of efficiency 10 %, using U²³⁵ as the nuclear fuel, calculate the amount of fuel required for one day operation.
 Assume that energy released per fission of U²³⁵ = 200MeV.
- 2C) With neat sketch explain the working of Pressurized Water Reactor (PWR). Mention (04) the advantages and disadvantages of BWR compared to the Pressurized Water Reactor (PWR).
- **3A)** With the neat sketch explain the working of wind electric generation unit. **(03)**
- **3B)** Calculate the maximum day length at New Delhi ($28^{\circ}35'$ N, $77^{\circ}12'$ E) on March 15. (03)
- **3C)** With neat sketch explain the working principle of a suitable instrument for **(04)**

measuring Global solar radiation.

- **4A)** Write a note on radiation hazards, shielding and Radioactive waste disposal. **(03)**
- 4B) With neat sketch explain the working principle of geothermal power plant which (03) use the wet steam.
- 4C) At a particular site the discharge (in millions of m³) of a river in twelve months from (04) January to December are given in the below table. i) Draw hydro graph and flow duration curve on the graph sheet and find the average monthly flow. ii) Estimate the power developed in MW if the available head is 90 m and the overall efficiency of generation is 87.4% assume each month to be 30 days.

Month	Discharge in millions		Month	Discharge in millions of		
	of cubic meter /			cubic meter / month		
	month					
January	30		July	80		
February	25		August	100		
March	20		September	110		
April	0		October	65		
May	10		November	45		
June	50		December	30		

- 5A) With neat sketch explain the working of Floating drum type biogas plant. (03)
- **5B)** With neat sketch explain the working of suitable OTEC system that makes use of **(03)** ammonia as working fluid.
- 5C) Write a note on
 - (a) Energy plantation (b) *Water hammering effect*

(04)