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Roll No.....

FIRST SEMESTER

B.TECH [1<sup>st</sup> YEAR]

SUPPLEMENTARY EXAMINATION

FEB- 2019

ME 101;

Basic Mechanical Engineering

Time: 3:00 Hours

Max. Marks: 50

Note: Write Part A and Part B separately in the same answer book.  
Answer any FIVE questions from each Part. Assume suitable missing data, if any

Part A

Q- 1): Define the followings –

- a) Thermal equilibrium (1)
- b) Displacement work (1)
- c) First law of thermodynamics for a closed system undergoing a change of state (1)
- d) Zeroth law of thermodynamics (1)
- e) Flow work (1)

Q-2) Derive the steady flow energy equation (SFEE). Apply this equation in compressor, nozzle. (5)

Q-3a) Discuss the Kelvin-Planck and Clausius' statement of second law of thermodynamics. (2.5)

Q- 3b) Write the similarities between heat and work. (2.5)

Q-4a) State and prove the Pascal's law. (2.5)

Q-4b: Explain: steady flow, unsteady flow, laminar flow, turbulent flow, compressible flow. (2.5)

Q-5) Using suitable P-v and T-s diagram, explain the various processes of Diesel and Otto Cycle. (5)

Q-6a) With the help of suitable diagram, explain the working of Pressurized Heavy Water Reactor. (2.5)

P.T.O

6b) Explain the factors which are considered for selecting the site for hydro-electric power plant. (2.5)

PART B

- Q.7) Discuss any five properties of moulding sand. (5)
- Q.8) Write the advantages and limitations of casting process. (5)
- Q.9) With the help of neat sketches discuss the following sheet metal operations: (a) Blanking (b) Bending (c) Drawing (5)
- Q.10) Draw the schematic diagram of a lathe machine and discuss its important parts. (5)
- Q.11) Explain the working of the following welding processes with the help of neat sketches. Also Give the applications and advantages of each: (a) Shielded metal arc welding (SMAW)  
(b) Resistance seam welding. (5)
- Q.12) Discuss with Figure (i) Mechanical comparator (ii) Vernier Height gauge (5)
- Q.13) Sketch and explain the following machining operations:  
(a) Taper turning (b) Counter boring (c) Reaming (5)