B.Tech. 4th Semester (ME) F-Scheme Examination,
May–2018
STEAM AND POWER GENERATION
Paper–ME–210–F

Time allowed : 3 hours] *[Maximum marks : 100*

Note : ***Question No. 1 is compulsory.*** *Attempt* ***one*** *question from each section. All questions carry equal marks.*

1. Explain the following terms : 5×4=20
   (a) Steam table and its uses
   (b) Heat balance
   (c) Mean effective pressure
   (d) Steam turbine
   (e) Effect of leakage in condenser

Section–A

2. Explain P-V, T-S, H-S diagram for Rankine and modified Rankine cycle. 20

3. What are fire tube and water tube boilers ? Classify them with neat and clean diagram. 20

Section–B

4. Explain the relationship between area, velocity and pressure in nozzle flow mathematically. 20

5. Derive work done and mean effective pressure from theoretical indicator diagram in steam engine. 20

Section–C

6. Define the term degree of reaction used in reaction turbine and prove that it is given by

$$R_d = (V_f / 2U) (\cot \beta_2 - \cot \beta_1)$$

when $V_{f_1} = V_{f_2} = V_f$ 20

7. Explain the following :

(i) Regenerative feed heating cycle

(ii) Binary vapour cycle 20

Section–D

8. What are steam condensers ? Explain elements of steam condensing plant alongwith neat and clean diagram. 20

9. Explain the following terms : 4×5=20

(i) Calorific value of fuels

(ii) Stochiometric Air fuel ratio

(iii) Excess air required for combustion

(iv) Exhaust gases analysis