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| **Scheme of Valuation/Answer Key**(Scheme of evaluation (marks in brackets) and answers of problems/key) |
| **APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**FOURTH SEMESTER B.TECH DEGREE EXAMINATION, APRIL 2019 |
| **Course Code: ME204** |
| **Course Name: THERMAL ENGINEERING (ME)** |
| Max. Marks: 100 |  | Duration: 3 Hours |
| **PART A** |
|  |  | ***Answer any three full questions, each carries 10 marks.*** | Marks |
| 1 | a) | Proper T-s diagram representation (2 marks)-Evaluation of state enthalpies using turbine and pump efficiencies:- h1=2758 kJ/kg, h2 (isen) =1795; h2 (actual)=1939; h3=174 and h4(act)=183. (3 marks)- Thermal efficiency = 31.4% (2 marks)-Mass flow rate = 123.6 kg/s (2 marks)-Total Heat Supply =318 MW (1 mark | (10)  |
| 2 | a) | With Regeneration:- Efficiency = 36.08% (2 marks); Specific steam consumption = 3.85 kg/kWh (2 marks) Without Regeneration :- Efficiency = 34.18% (1marks); Specific steam consumption = 3.46 kg/kWh; (1marks)Increase in efficiency = 1.9% (2 marks): Increase in specific steam consumption = 0.39 kg/kWh (2 marks) | (10) |
| 3 | a) | Figure -1 marks, Explanation - 3 marks | (4)  |
|  | b) | Definition - 2 marks; Proof - 4 marks | (6) |
| 4 | a) | Sketch-3 marks, Explanation-4 Marks. Differentiate- 3 marks | (10) |
| PART B |
| *Answer any three full questions, each carries 10 marks.* |
| 5 | a) | Figures of both cases– 1 mark each, Explanation of both cases – 1 mark each | (4) |
|  | b) | Figures – 3 marks, Explanation – 3 marks | (6) |
| 6 | a) | Heat addition = 1235.5 kJ/kg, ( 3 marks )Heat rejected = 557.5 kJ/kg ( 3 marks )Efficiency = 54.9%( 4 marks ) | (10) |
|  | b) |  | () |
| 7 | a) | Figures – 2 marks, Explanation – 2 marks | (4) |
|  | b) | Morse test description 3 marks, Discretion 3 marks | (6) |
| 8 | a) | Explanation-6 marks | (10) |
|  | b) | Explanation with figure-4 marks |  |
| **PART C** |
| ***Answer any four full questions, each carries 10 marks.*** |
| 9 | a) | 4 points – 4 marks | (4) |
|  | b) | Explanation – 6 marks | (6) |
| 10 | a) | Figure -1 marks, Explanation - 3 marks | (4) |
|  | b) | Figure -2 marks, Explanation - 4 marks | (6) |
| 11 | a) | 4 points – 4 marks | (4) |
|  | b) | Figure -2 marks, Explanation - 4 marks | (6) |
| 12 | a) | Net power output = 2019 kW (4 marks)Specific fuel consumption = 0.3762 kg/kW h (3 marks)Thermal efficiency = 22.2% (3 marks) | (10) |
|  | b) |  |  |
| 13 | a) | Power output = 224 kW (5 Marks), Thermal efficiency = 17.22% - (5 marks) | (10) |
|  | b) |  |  |
| 14 | a) | Derivation- 3 marks, representation of the cycle-2 marks | (5) |
|  | b) | Figure – 2 marks, Explanation – 3 marks  | (5) |
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