

9. (a) Why do you need simulation and models?
- (b) Calculate the heat content of steam generated from a boiler at 96% dryness fraction [given sensible heat at 170°C saturation temperature is 171 kcal/kg and latent heat = 489.6 kcal/kg].

6 + 6 = 12

**ENERGY MANAGEMENT AND AUDIT  
(REEN 6101)**

Time Allotted : 3 hrs

Full Marks : 70

*Figures out of the right margin indicate full marks.*

*Candidates are required to answer Group A and any 5 (five) from Group B to E, taking at least one from each group.*

*Candidates are required to give answer in their own words as far as practicable.*

**Group - A  
(Multiple Choice Type Questions)**

1. Choose the correct alternative for the following: **10 × 1 = 10**
- (i) Which of the following is most accurate instrument for surface temperature measurement for a hot pipe line?  
 (a) Infrared temperature gun (b) Optical pyrometer  
 (c) Leaf type contact thermocouple (d) All mentioned above.
- (ii) One tone of refrigeration has the ability to remove -----heat in 24 hour period.  
 (a) 50 kcal (b) 3014 kcal (c) 72576 kcal (d) 12000 kcal.
- (iii) Which energy source release the most climate alarming carbon pollution per kg.  
 (a) Oil (b) Coal (c) Rice husk (d) Bagasse.
- (iv) Power factor in an alternating current (AC) circuit is given by.  
 (a) KW/KVA  
 (b)  $\frac{KW}{\sqrt{KW^2 + KVAR^2}}$   
 (c)  $[(KVA + KVAR)(KVA - KVAR)]^{0.5} / KVA$   
 (d) All mentioned above .
- (v) If air contains 77% by weight of nitrogen and 23% by weight of oxygen. The mean molecular weight of air is,  
 (a) 11.9 (b) 28.8 kg (c) 17.7 (d) none.
- (vi) A 230 volt, 100 watt rated incandescent bulb is operated at a constant voltage of 250 volt. Approximate power consumption of bulb is  
 (a) 100 watt (b) 118 watt  
 (c) 85 watt (d) none of the above.

