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BEY–001

BACHELOR OF SCIENCE (APPLIED SCIENCE–ENERGY) (BSCAEY)

Term-End Examination

December, 2025

BEY-001 : THERMAL SCIENCE

Time : 3 Hours *Maximum Marks : 70*

Note : *(i) Answer any **seven** questions.*

(ii) All questions carry equal marks.

(iii) Use of scientific calculator is permitted.

(iv) Assume suitable data, missing if any.

1. What are System, Surrounding and Control Volume ? Differentiate between 'System' and 'Control Volume'. 10

2. (a) Explain the difference between 'Process' and 'Path' with neat sketches. 5

   (b) Describe and explain a 'Thermal Cycle'. 5

3. 60 litres of air at 70°C expands from 7 bar to 1.05 bar according to the law $PV^n = C$. The volume of air after expansion is 300 litres. Determine the mass of air and the work done during the process. 10

4. (a) Explain in brief term 'Reversible Engine'. 5

   (b) Explain and show the various processes in a Carnot cycle using a P-V diagram. 5

5. What are boiler mountings ? Name a few of them and discuss any *two* of them in detail. 10

6. What is Rankine cycle ? Discuss the process of 'Regeneration' and 'Reheating' in a Rankine cycle. 10

7. Derive the General Heat Conduction Equation using Cartesian co-ordinates and assuming heat flow through a small cuboidal element. 10

8. Discuss in detail the differences between a 'two-stroke' and a 'four-stroke' engine using neat sketches. 10

9. Describe the construction and working of a vapour compression refrigeration system with the help of a neat diagram. 10

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