Automotive Refrigeration & Air Conditioning

B.E. Sem. VIII [AUTO] (Elective – II)

EVALUATION SYSTEM

	Time	Marks
Theory Exam	3 Hrs.	100
Practical & Oral	–	–
Oral Exam	–	25
Term Work	–	25

SYLLABUS

1. **Refrigeration**
   Introduction, Methods of refrigeration, Air Refrigeration System and its applications, Vapour compression refrigeration system, Vapour absorption refrigeration system, Applications of refrigeration & air conditioning, Automobile air conditioning , Air conditioning for passengers, isolated vehicles, transport vehicles, Applications related with very low temperatures

2. **Refrigerant**
   Classification, properties and selection criteria
   Commonly used refrigerants
   Alternative refrigerants, Eco-friendly refrigerants, Applications of refrigerants
   Refrigerants used in automobile air conditioning.

3. **Psychometry**
   Psychometric properties, tables, charts; Psychometric processes, Comfort charts, Factor affecting comfort, Effective temperature, Ventilation requirements.

4. **Air Conditioning Systems and Load Analysis**
   Classification and layouts
   Central / unitary air conditioning systems
   Components like compressors, evaporators, condensers, expansion devices, fan blowers, heating systems etc.
   Load Analysis:
   Outside & inside design consideration, Factors forming the load on refrigeration & air conditioning Systems, Cooling & heating load calculations, Load calculations for automobiles, Effect of air conditioning load on engine performance

5. **Air Distribution Systems**
   Distribution duct system, sizing, supply / return ducts, Types of grills, diffusers, ventilation, air noise level, Layout of duct systems for automobiles and their impact on load Calculations
   Air Routine & Temperature Control:
   Objectives - evaporator care air glow, Through the dash recirculating unit, Automatic temperature control, Controlling flow, Control of air handling systems.

6. **Air Conditioning Service and Control**
   Air conditioner maintenance & service - servicing heater system, Removing & replacing components Trouble shooting of air conditioning system, Compressor service, methods of dehydration, charging & testing.
   Air Conditioning Control
   Common control such as thermostats, Humidistat us, Control dampers, Pressure cutouts and relays

References Books :

1. Refrigeration and Air-Conditioning (*W.F. Stoecker and J.W. Jones*) Tata McGraw Hiil Pub.
2. Modern Air-Conditioning Practice (*Norman C. Harris*); Principles of Refrigeration (*R.J. Dcssat*) Wiley Eastern Pub.
3. Refrigeration and Air-Conditioning (*C.P. Arora*) Tata McGraw Hill Pub
4. Heating & Air Conditioning Systems – Mitchell Information Services
5. Thermal Engineering (*Kumar & Sah*) Narosa Publication, second edition ,New Delhi
6. Automotive Air Conditioning (*Paul Lung*) C.B.S. Publisher & Distributor, Delhi.
7. Modern Air Conditioning (*Harris*)
8. ASHRAE Handbook – 1985 Fundamentals, American Society of Heating, Refrigeration & Air Conditioning

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