Code No: **R42245** **R10** **Set No. 1**

**IV B.Tech II Semester Regular/Supplementary Examinations, April - 2015**

# AUTOMOTIVE AIR CONDITIONING

**(Automobile Engineering)**

**Time: 3 hours** **Max. Marks: 75**

**Answer any FIVE Questions**
**All Questions carry equal marks**
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1 a) With a neat sketch explain the working of vapour compression refrigeration system and derive the expression for COP.
   b) What is a refrigerant? Explain the properties of ammonia refrigerant.

2 a) What is a compressor? What is its role in air conditioning system? With a neat sketch explain the working of reciprocating compressor.
   b) What is accumulator? What is its importance in a refrigeration system? Explain its working with a neat sketch.

3 a) What are the different sensors used in automotive air conditioning system. Explain their significance and functioning.
   b) What are the important considerations in the design of automotive air conditioning system?

4 a) Explain how the load on air conditioning will effect the performance of the engine of an automobile.
   b) Explain the indoor and outdoor factors that are to be considered in selecting an appropriate air conditioning system for an automobile.

5 a) Explain different air distribution layouts that are used in n automobile air conditioning systems. Draw their simple layouts.
   b) Explain the factors governing optimum effective temperature.

6 a) What is the necessity of air conditioning in an automobile? Explain how it would increase the comfort of the passengers.
   b) Explain the evacuating and charging of accumulator systems in an air conditioning unit.

7 a) Explain the procedure of finding leaks with a bubble detector in an air conditioning unit.
   b) Explain how System performance in an air conditioning unit can be evaluated.

8 a) Explain the procedure of servicing a compressor in an air conditioning unit.
   b) Explain different methods of dehydration.

Code No: **R42245** **R10** **Set No. 2**

**IV B.Tech II Semester Regular/Supplementary Examinations, April - 2015**

# AUTOMOTIVE AIR CONDITIONING

**(Automobile Engineering)**

**Time: 3 hours** **Max. Marks: 75**

**Answer any FIVE Questions**

**All Questions carry equal marks**

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1 a) With a neat sketch explain the working of expansion valve air conditioning system.

b) Explain the desirable properties of ideal refrigerant.

2 a) What is a compressor? What is its role in air conditioning system? With a neat sketch explain the working of rotary vane compressor.

b) What is accumulator? What is its importance in a refrigeration system? Explain its working with a neat sketch.

3 a) Explain the importance of heating and air conditioning system in an automobile.

b) Classify different types of heating systems. Explain the working of a heating system that is used in automobile.

4 a) Explain how the load on air conditioning will effect the performance of the engine of an automobile

b) Explain the influence of refrigerants in producing green house effect to the planet.

5 a) Explain different air distribution layouts that are used in n automobile air conditioning systems. Draw their simple layouts.

b) Explain the working of automatic temperature control system in an air conditioning system.

6 a) What is the necessity of air conditioning in an automobile? Explain how it would increase the comfort of the passengers.

b) What are the specific problems in an automobile air conditioning system that are to be considered at the time of design when compared with house hold air conditioning.

7 a) Explain the servicing procedure of heater system of an automobile air conditioning system. Discuss what happens if regular servicing is no done.

b) Explain the procedure of finding leaks with an electronic leak tester in an air conditioning unit.

8 a) Explain the role of relays and pressure cutouts in air conditioning control.

b) What are the purposes of automatic controls? Explain different methods of humidity control.

Code No: **R42245** **R10** **Set No. 3**

**IV B.Tech II Semester Regular/Supplementary Examinations, April - 2015**

# AUTOMOTIVE AIR CONDITIONING

**(Automobile Engineering)**

**Time: 3 hours** **Max. Marks: 75**

**Answer any FIVE Questions**
**All Questions carry equal marks**
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1 a) With a neat sketch explain the working of automotive air conditioning system.

b) What is a refrigerant? Explain the properties of $CO_2$ refrigerant.

2 a) With a neat sketch explain the working of Scroll (helix) type compressor. Write its merits and demerits.

b) With a neat sketch explain the working of central air conditioning system.

3 a) What is the significance of anti frosting device? Explain its working with a neat sketch.

b) Explain the significance of automotive air conditioning in providing comfort to the passengers.

4 a) Explain the factors affecting performance & Energy Efficiency of an automotive air conditioning system.

b) Explain the impact of condensing and evaporation temperatures on compressor power consumption.

5 a) How would you calculate the heating/cooling load for an automobile to be air-conditioned? Explain in detail.

b) Discuss on different layouts of duct systems for automobiles and explain their impact on load calculations.

6 a) What is the necessity of air conditioning in an automobile? Explain how it would increase the comfort of the passengers.

b) Differentiate between central, District and unitary air conditioning system.

7 a) Explain the trouble shooting procedure of an automobile air conditioning system.

b) What are the different methods of controlling the temperature in an automotive air conditioning system? Discuss their relative merits.

8 a) Explain the role of humidistat and control dampers in air conditioning control.

b) What are the Common Refrigerants that are generally used in automotive air conditioning and explain their Properties.

Code No: **R42245** **R10** **Set No. 4**

**IV B.Tech II Semester Regular/Supplementary Examinations, April - 2015**

# AUTOMOTIVE AIR CONDITIONING

**(Automobile Engineering)**

**Time: 3 hours** **Max. Marks: 75**

**Answer any FIVE Questions**
**All Questions carry equal marks**

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1 a) With a neat sketch explain the working of fixed orifice valve air conditioning system.
   b) What are the important considerations in the design of air conditioning system?

2 a) What is a condenser? What is its role in air conditioning system? With a neat sketch explain the working of tube and plate type condenser.
   b) Discuss the working of Variable orifice valve with a neat sketch.

3 a) Explain how air conditioning system is protected from the engine heat in an automobile.
   b) Classify different types of heating systems. Explain the working of a heating system that is used in automobile.

4 a) Explain how heating and cooling load calculations are done for an automobile air conditioning system.
   b) Explain the factors that are to be considered in selecting an appropriate air conditioning system for an automobile.

5 a) Explain the factors that effect the air noise in an automobile. What modifications are required in an air conditioning system to reduce the air noise?
   b) List a few energy efficiency improvement options in an automotive air conditioning system.

6 a) What is a re-circulation unit? Explain its role in air conditioning system and write its significance in providing human comfort.
   b) Explain the testing procedure of air control of air handling systems.

7 a) Explain the trouble shooting procedure of an automobile air conditioning system.
   b) Explain the Evacuating procedure of a non-accumulator type air conditioning system.

8 a) Explain the importance of Thermostat in air conditioning system with a neat sketch.
   b) Describe briefly different types of humidostats used for controlling the humidity.