

Reg No.: \_\_\_\_\_

Name: \_\_\_\_\_

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**  
**SEVENTH SEMESTER B.TECH DEGREE EXAMINATION(S), MAY 2019**

**Course Code: AU405**

**Course Name: AUTOMOTIVE REFRIGERATION AND AIR CONDITIONING**

Max. Marks: 100

Duration: 3 Hours

**PART A**

*Answer any three full questions, each carries 10 marks.*

Marks

- 1 Explain air refrigerator working on a Bell Coleman cycle , and derive an expression for COP (10)
- 2 a) What is the function of expansion devices in automobile air-conditioning? (4)  
b) Explain any two types of expansion devices with neat sketch (6)
- 3 In a refrigeration plant working on Bell Colman cycle, air is compressed to 6 bar from 1 bar. Its initial temperature is 12 °C .After compression the air is cooled up to 20°C in a cooler before expanding back to a pressure of 1bar .Determine the theoretical COP of the plant and net refrigeration effect. Take  $C_p = 1.005 \text{ KJ/Kg}$  and  $C_v = 0.718 \text{ KJ/KgK}$  (10)
- 4 a) What do you meant by air conditioning? (3)  
b) What are the factors affecting air conditioning? (7)

**PART B**

*Answer any three full questions, each carries 10 marks.*

- 5 a) Explain the purpose of load analysis. (4)  
b) List the procedure for determining the load analysis in air conditioning? (6)
- 6 Explain the parameters involved in the design of air conditioning systems in automobiles? (10)
- 7 Draw the layout of any four duct systems provided in automobiles and explain any six classification of duct system? (10)
- 8 Explain any three types of air distribution systems used in automobiles? (10)

**PART C**

*Answer any four full questions, each carries 10 marks.*

- 9 Explain any three air conditioning control devices (10)
- 10 a) What is the role actuator in automatic temperature control? (4)

- b) Explain the air conditioning control using pressure cut outs (6)
- 11 Explain the automatic temperature control in automobile (10)
- 12 a) What are the causes for little or no heat condition in automotive AC system? (2)
- b) Explain the common problems associated with heating system (8)
- 13 a) Why is it necessary to purge the gauge set and hose before charging (5)
- b) Explain the procedure used to discharge and charge the refrigeration system (5)
- 14 a) List the causes of refrigerant leaks (5)
- b) Explain the testing methods for detection of leaks in refrigeration system? (5)

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