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

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

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**  
**FIRST SEMESTER B.TECH DEGREE EXAMINATION, JANUARY 2017**  
**ME100 : BASICS OF MECHANICAL ENGINEERING**

Max. Marks: 100

Duration: 3 Hours

**PART A**

*Answer any two questions*

1. a) Discuss different modes of heat transfer. (3)  
b) Differentiate between enthalpy and entropy. (3)  
c) Derive an expression for the air standard efficiency of Otto cycle. (9)
2. a) Differentiate between closed and open cycle type of gas turbines. (3)  
b) Explain the term cavitation. (3)  
c) With the help of a neat diagram, explain the working of an SI engine which develops one power stroke during two crank rotations. (9)
3. a) Discuss the various functions of a draft tube. (3)  
b) Explain the term Specific heat at constant volume and constant pressure. (3)  
c) In an ideal diesel cycle, the temperature at the beginning and end of compression is  $65^{\circ}\text{C}$  and  $620^{\circ}\text{C}$  respectively. The temperature at the beginning and end of the expansion is  $1850^{\circ}\text{C}$  and  $850^{\circ}\text{C}$ . Determine the ideal efficiency of the cycle. Take  $\gamma = 1.4$ . If compression ratio is 15 and pressure at the beginning is 1 bar, calculate the maximum pressure in the cycle. (9)

**PART B**

*Answer any two questions*

4. a) Differentiate between the COP and efficiency of a system. (3)  
b) Differentiate between vapor compression refrigeration system and vapor absorption refrigeration system. (3)  
c) With the help of a suitable sketch explain the working of a split air conditioner; also mention the advantages over window air conditioning system. (9)
5. a) List various advantages of chain drives. (3)  
b) Explain the working of a simple carburetor. (3)  
c) Discuss any two types of braking mechanisms commonly used in automobiles (9)

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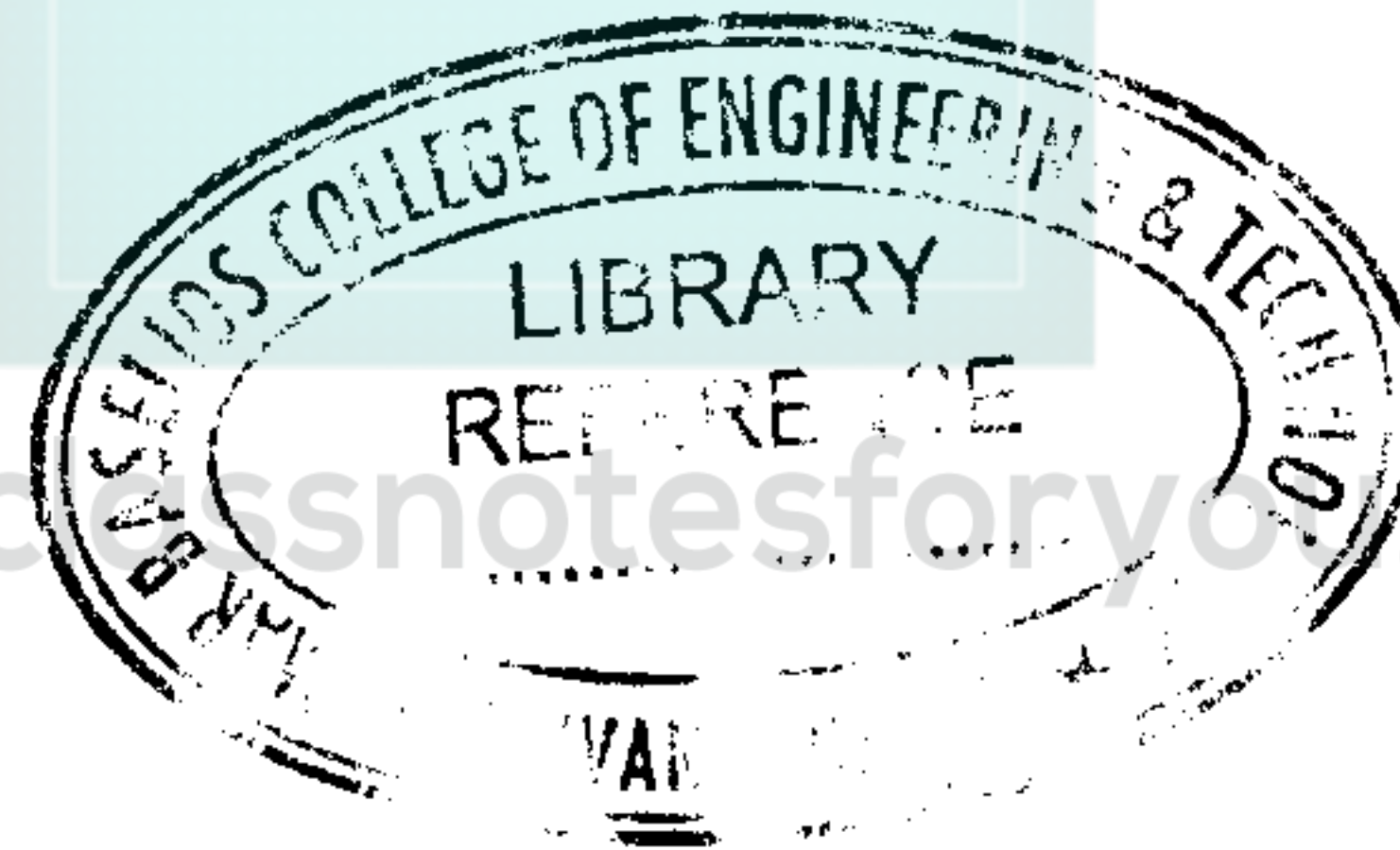
6. a) Explain the different functions of a clutch. (3)  
b) Explain different classifications of IC engines. (3)  
c) Explain the working of belt drive and gear drive with the help of neat sketches. (9)

**PART C**

*Answer any two questions*

7. a) Explain the functions of runners and risers used in casting. (5)  
b) Explain the processes involved in powder metallurgy. (5)  
c) Explain the method employed for making metal sheets/plates in manufacturing process. Also discuss their classification and types. (10)
8. a) List out any four operations that can be performed on a drilling machine. (5)  
b) State various advantages of CNC machines over conventional machines. (5)  
c) With the help of suitable sketch explain the principle parts of a lathe. (10)
9. a) Differentiate between brazing and soldering. (5)  
b) Discuss various advantages of grinding process. (5)  
c) With neat sketches explain about working and various operations that can be performed on a milling machine. (10)

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