*Regulation R17* *Subject code: 1P5CB*

# TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A' Grade)

## B.Tech III Year I Semester Supplementary Examinations, June 2022

## THERMAL ENGINEERING-I

(MECHANICAL ENGINEERING)

*Maximum Marks: 70* Duration: 3 hours

**Note:** **1.This question paper contains two parts A and B.**
**2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.**
**3. Part B consists of 5 Units. Answer any one full question from each unit.**
**4. Each question carries 10 marks and may have a, b, c, d as sub questions.**

Part-A

**All the following questions carry equal marks** **(10x2M=20 Marks)**

1 Stoichiometric air-fuel ratio means?
2 List the advantages of valve timing diagram?
3 What is called flame front and flame velocity?
4 What is ignition delay period?
5 Define brake power
6 Define volumetric efficiency?
7 Draw the diagram of Roots blower compressor?
8 What is power input factor in compressor?
9 Define refrigeration
10 What are the different components of vapour compression system

Part-B

Answer All the following questions. **(10M X 5=50Marks)**

11 Explain cooling system for IC engines? 10

OR

12 Explain Battery ignition system with a neat diagram? 10

13 State and explain different combustion stages in SI engine? 10

OR

14 What are the types of fuel injection systems? Explain any one with a neat sketch? 10

15 Discuss different types of dynamometers. 10

OR

16 What is the condition for maximum efficiency in multistage compression? 10

17 Give the analysis of centrifugal compressor with the help of velocity diagrams? 10

OR

18 An air compressor takes in air at 1 bar and 20 $^0$ C and compresses it according to law pv $^{1.2}$ = constant .It is then delivered to a receiver at a constant pressure of 10 bar. R=0.287 KJ/Kg K. Determine : (i) Temperature at the end of compression (ii) Work done and heat transferred during compression per kg of air 10

19 Describe a simple vapour compression cycle giving clearly its flow diagram? 10

OR

20 28 tonnes of ice from and at 0 $^0$ C is produced per day in an ammonia refrigerator. The 10

temperature range in the compressor is 25 $^0$ C to -15 $^0$ C. The vapour is dry and saturated at the end of compression and an expansion valve is used. Assuming a co efficient of performance of 62% of the theoretical, calculate the power required to drive the compressor. take latent heat of ice is 335 KJ/kg