



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, January 2023
THERMAL ENGINEERING-I
(MECHANICAL ENGINEERING)

Maximum Marks: 70

09-01-2023

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.

(5X10M=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 °C and compresses it according to law $p v^{1.2} = \text{constant}$. 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°C is produced per day in an ammonia refrigerator. The temperature range in the compressor is 25°C to -15°C . The vapour is dry and saturated at the end of compression and an expansion valve is used. Assuming a coefficient of performance of 62% of the theoretical, calculate the power required to drive the compressor. take latent heat of ice is 335 KJ/kg 10