QP Code: 3325QP

Seat No.	

Total No. of Pages: 2

January - February (Winter) Examination - 2023

Subject Name: B.Tech. CBCS_71820_Basic Mechanical Engineering_31.03.2023_10.30 AM To 01.00 PM

Subject Code: 71820

Day and Date: Friday, 31-03-2023
Time: 10:30 am to 01:00 pm

Total Marks: 70

Instructions.:
1) Figures to the right indicate full marks
Special Instruction.:
1) Attempt any three questions from each section 2) Assume suitable data if necessary and mention it clearly. 3) Use of non-programmable calculator is allowed.

Q.1. **SECTION I** **[12]**

a) Define thermodynamic state, thermodynamic process and thermodynamic cycle. (6)
b) In a gas turbine power plant the gases flow through the turbine is 15 kg/sec. and the power developed by turbine is 12000 kW. The enthalpies of gases at the inlet and outlet are 1260 kJ/kg and 400 kJ/kg respectively. The velocities of gases at the inlet and outlet are 50 m/sec. and 110 m/sec. Calculate the rate at which the heat is rejected. (6)

Q.2. **a) Compare C. I Engine with S. I Engine. (6)** **[12]**
b) Represent Joule cycle on P-V diagram and obtain expression of air standard efficiency (6)

Q.3. **a) Explain working of vapour absorption refrigeration system (6)** **[11]**
b) Define the following terms (5)
1. Dry air
2. Moist air
3. Saturated air
4. Degree of saturation
5. Specific Humidity

Q.4. **Write short notes: (12)** **[12]**
1. Solar refrigeration system.
2. Assumption in air standard cycles.
3. PMM-I and PMM-II.

Q.5. **SECTION II** **[12]**

a) Draw a layout of hydroelectric power plant and explain its working (6)
b) What is Biodiesel? State its advantages and limitations (6)

Q.6. **a) Explain reciprocating air compressor with Neat Sketch (5)** **[12]**
b) A cross belt connects two pulleys of 500 mm diameter, 2 m apart. The initial tension in the belt is 500 N, if the co-efficient of friction between belt and pulley is 0.3. Find the power transmitted at 700 rpm. Also calculate the length of belt (7)

Q.7. **a) Explain Metal removing Processes in detail (5)** **[11]**
b) Explain any two Metal Joining process (6)

Q.8. **a) Compare belt, chain and gear drive (5)** **[11]**
b) Explain with neat sketch the parabolic collectors (6)

SP-08

Total No. of Pages : 2

Seat No.	

First Year B.Tech. (All Branches) (Semester - I/II) (Revised) (CBCS) Examination, January - 2024

BASIC MECHANICAL ENGINEERING

Sub. Code: 71820

Day and Date : Monday, 15- 01 - 2024 **Total Marks : 70**

Time : 10.30 a.m. to 1.00 p.m.

Instructions :
1) **Attempt any three questions from each section.**
2) **Figures to the right indicate full marks.**
3) **Assume suitable data if necessary and state them clearly.**
4) **Use of non-programmable calculator is allowed.**

SECTION-I

Q1) a) Define thermodynamic state, thermodynamic process and thermodynamics cycle. **[5]**

b) A steam turbine receivers steam at a rate of 0.42 kg/s. The inlet and outlet conditions are given below. **[6]**

	Inlet	Outlet
Enthalpy	2785KJ/kg	2512KJ/kg
Velocity	33.3 m/s	100 m/s
Elevation	3 m	0m

If the heat lost to the surrondings is 0.29 KJ/s, find out the power output of the turbine under steady flow conditions.

Q2) a) Describe the working of four stroke SI engine with neat sketch. **[6]**

b) Differentiate two stroke and four stroke engines. **[6]**

Q3) a) Enumerate properties of good refrigerant. **[5]**

b) Explain with neat sketch Window Air Conditioner. **[6]**

P.T.O.

Q4) Write short notes: **[12]**

a) Different types thermodynamic systems

b) Application of refrigeration.

c) Different forms of energy

SECTION-II

Q5) a) Differentiate renewable and non-renewable energy sources. Enlist different applications of solar energy. **[6]**

b) Explain construction and working of Photovoltaic cells. **[6]**

Q6) a) Explain reciprocating air compressor with neat sketch. **[5]**

b) Two pulleys are 4.8 m apart. The larger pulley is 2.4 m diameter and smaller pulley is of 1.8 m diameter, the smaller pulley rotates at 180 rpm, the initial tension in the belt is 2.4 KN. Calculate the power transmitted by open belt drive if the coefficient of friction between belt and pulley is 0.3 **[7]**

Q7) a) Explain soldering and brazing. **[5]**

b) Explain lathe machine with simple sketch. **[6]**

Q8) Write notes on: **[12]**

a) Belt, chain and gear drive

b) Gear train

c) Biogas plant.