Roll No												

PRESIDENCY UNIVERSITY
BENGALURU

SCHOOL OF ENGINEERING

MAKEUP EXAMINATION – JAN 2023

Course Code: MEC 101

Course Name: Elements of Mechanical Engineering

Program: B.Tech

Date: 24-JAN-2023

Time: 9.30AM to 12:30 PM

Max Marks: 100

Weightage:50%

Instructions:

(i) Read all the questions carefully and answer accordingly.

(ii) Scientific calculators are permitted.

(iii) You are not permitted to share dictionaries, calculators or any other materials during the examination.

Part A [Memory Recall Questions]

Answer all the Questions. Each question carries five marks. (6Qx 5M= 30M)

1. Define dryness fraction & mention its value for dry steam and wet steam? (C.O.No.1) [Knowledge]
2. State all laws of thermodynamics. (C.O.No.1) [Knowledge]
3. List out the different methods of Soldering and Brazing (C.O.No.4) [Knowledge]
4. What is BP, IP and FP and how all three are related. (C.O.No.2) [Knowledge]
5. Write the classification of Internal Combustion Engine. (C.O.No.2) [Knowledge]
6. Write advantage and disadvantage of chain drive power transmission system. (C.O.No.3) [Knowledge]

Part B [Thought Provoking Questions]

Answer all the Questions. Each question carries ten marks. (4Qx10M=40M)

7. There is a toothed wheel that works with others to alter the relation between the speed of a driving mechanism (such as the engine of a vehicle) and the speed of the driven parts (the wheels). Identify the type of Transmission Drive and Explain the different types of it with proper diagram. (C.O.No.3) [Comprehension]
8. US Engineer Willis Carrier built a device “Z” to comfort the patients in ICU. Identify the device “Z” and explain the working with proper block diagram. (C.O.No.1) [Comprehension]
9. A turbine “X” is invented by Austrian scientist, Viktor Kaplan in 1913. This turbine “X” is a reaction-type water turbine, which extracts energy from the pressure energy of moving water and it is axial Turbine. Identify the Turbine “X” and explain its working with neat diagram. (C.O.No.2) [Comprehension]
10. A machine “Y” is known as mother of all machines. In this machine, workpiece rotates about an axis of rotation to perform various operations. Identify the machine and explain the different operation which can be performed on the machine. (C.O.No.4) [Comprehension]

Part C [Problem Solving Questions]

Answer all the Questions. Each question carries ten marks. (3Qx10M=30M)

11. Suppose you have an ice cube of 600 grams at – 25^{O}C and it is being converted into steam of 240 ^{O}C. So, how much heat should be supplied to convert ice into steam? Take latent heat of fusion is 334 kJ/kg and latent heat of vaporization is 2260 kJ/kg. Specific heat of ice, water and steam are 2.108 kJ/kg K, 4.187 kJ/kg K and 1.996 kJ/kg K respectively. (C.O.No.1) [Application]

12. A 4-cylinder four-stroke petrol engine develops runs at 1000 rpm and develops 14.7 kW indicative power. The mean effective pressure is 5.5 bar, Calculate the bore and stroke of the engine, if the length of the stroke is 1.5 times the diameter. (C.O.No.2) [Application]

13. Tension in tight and slack side of belt on driving pulley is 400 N and 100 N respectively, driving pulley diameter is 100 mm and it rotates with 100 RPM. Calculate power transmitted by driving pulley to driven pulley? (C.O.No.3) [Application]