B.E / B.Tech. PRACTICAL END SEMESTER EXAMINATIONS, APRIL/MAY 2023

Fourth Semester

ME 3461- THERMAL ENGINEERING LABORATORY

(Regulations 2021)

Time : 3 Hours Answer any one Question Max. Marks 100

Aim/Principle/Apparatus required/Procedure	Tabulation/Circuit/ Program/Drawing	Calculation & Results	Viva-Voce	Record	Total
20	**30**	**30**	**10**	**10**	**100**

1. (a) Draw the four-stroke engine port timing diagram by observing opening and closing of various Ports. (50 Marks)

   (b) Determine the Flash and Fire point of given oil using Open cup apparatus/Closed cup apparatus. (50 Marks)

2. Perform the Morse test on a multi-cylinder petrol engine, determining friction power and mechanical efficiency in each cylinder and tabulating your results. (100 Marks)

3. Perform a retardation test on a diesel engine to determine the frictional power of the engine produces. Apply 25% of the maximum load and record your results. (100 Marks)

4. Perform a performance test on the steam turbine. Determine the mechanical efficiency, the brake thermal efficiency,the Rankine efficiency, and the specific steam consumption. (100 Marks)

5. Determine the volumetric efficiency of a specific two-stage reciprocating air compressor by performing the performance test. (100 Marks)

6. Calculate the system's actual COP by performing a performance analysis on a refrigeration test rig.Also calculate Carnot COP and Relative COP from the temperature and pressure measured at salient points. (100 Marks)

7. Conduct a performance test on two stage Reciprocating Air Compressor. (100 Marks)

8. Conduct a heat balance test on a single cylinder four stroke diesel engine using different loads at constant speed. (100 Marks)

9. Carry out the heat balancing test on a diesel engine under varied loads of 0%, 20%, 40%, 60%, and 80% of its maximum capacity. Draw up the heat balance sheet. (100 Marks)

10. (a) Draw the Port timing diagram of two stroke engine observing opening and closing of various ports. (50 Marks)

    (b) Draw the Valve timing diagram of four stroke petrol engine observing opening and closing of inlet and exhaust valves. (50 Marks)

11. Conduct Morse test on given multi cylinder petrol Engine to determine the indicated power developed in each of the cylinder in the engine and to determine the Mechanical efficiency. (100 Marks)

12. Perform a performance test on the steam generator to find out the evaporating capacity, equivalent evaporation, factor of evaporation, and boiler efficiency. (100 Marks)

13. Conduct the performance test on a diesel engine at 20%, 40%, 60% & 80% of varying loads using Mechanical loading. Determine Friction power,Mechanical efficiency, Brake thermal efficiency, volumetric efficiency & Specific fuel consumption. Draw the graph for SFC, η_{BT}, η_{Mech} vs. BP. Tabulate the results. (100 Marks)

14. (a) Draw a valve timing diagram for the specified four-stroke engine model and record the various valve opening and closing measurements. (50 Marks)

    (b) Determine the Flash and Fire point of a given oil using Open cup apparatus/Closed cup apparatus. (50 Marks)

15. Perform an experiment to determine an IC engine's actual p-θ diagram and heat release characteristics. (100 Marks)

16. Conduct a performance test on refrigeration rig and to determine the C.O.P and refrigeration efficiency. (100 Marks)

17. Carryout the Retardation test on a Diesel Engine to determine Frictional power, Brake power and Mechanical efficiency Apply 40% of full load. Tabulate your results. (100 Marks)

18. Perform a performance test on a four-stroke diesel engine and draw its characteristic curves. (100 Marks)

19. Conduct a load test on four stroke diesel engine and draw the actual p-V diagram of Compression Ignition Engine/Spark Ignition Engine. (100 Marks)

20. Write down the step-by-step instructions for conducting a performance test on a steam generator and a steam turbine, as well as a description of the various types of steam generators and steam turbines with clear diagrams. (100 Marks)