AUTOMOBILE TECHNOLOGY

Class XII

OPTIONAL

MECHANICAL ENGINEERING (626)

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THEORY

Time: 3 Hours ***Marks: 60***

1. **Transmission of Power:** Uses of belts and ropes (without including their materials), pulleys different types of pulleys. Chain drive, its comparison with belt drive. Gear drive, types of gears, simple gear trains and velocity ratio. Description of single plate disc. clutch. **12**
2. **Steam Biolers:** Coch boiler, Lancashire boiler, Bibcock and Wilcox boiler, Baby Vertical boiler, their mountings and accessories. **12**
3. **Turbines:** Classification and application of turbines. Elementary study of different types of turbines-construction and working of D' Level and Parson's turbine, pelton wheel, Francis and Kaplan turbine. **12**
4. **I.C. Engines and Compressors:** Classification and application of I.C. engines commonly used, spark ignition and compression ignition engines, working principles of two stroke and four stroke Petrol and Diesel engines Ignition engines, working principles of two stroke and four stroke Petrol and Diesel engines. Ignition systems in Petrol engines. Construction and working of a simple reciprocating compressors. **12**
5. **Material Handling:** Brief treatment of bulldozer, shovel, road roller, concrete mixer, crane, travelling gantry crane, screw Jack, hydraulic Jack. **12**

PRACTICAL

Time: 2 Hours ***Marks: 40***

1. To study various devices for transmission of power, models of belts, pulleys, gears and chains.
2. To study baby vertical boiler with the help of model.
3. To study Lancashire boiler with the help of model.
4. To study Bibcock and Wilcox boiler with the help of model.
5. To study simple steam turbine with the help of model.
6. To study 4 stroke petrol and diesel engines with the help of model.
7. To study 2 stroke petrol engine with the help of model.
8. To study ignition system of petrol engine.
9. To study cooling system of IC engine.
10. To study simple reciprocating air compressor.
11. To study Hydraulic Jack and screw-Jack.

Guidelines for Examiners

(Common for Practical Paper II & III)

Examiner will evaluate the candidate as per the following guidelines:

1. Systematic approach to the problem.
2. Dismantling, assembling and replacing of components etc.
3. Safety precautions.
4. Initiative taken by individual candidate.
5. Proper use of tools.

6. Special consideration be given for skill, workmanship and finish.
7. Records of on-job-training.

Note: Each student may be allotted two experiments from the list and he/she may perform any one out of the two.

General Instructions to the Students/Candidates

(Common for Practical Paper II & III)

1. It is essential for each student to complete every Practical himself and not merely watch others doing it.
2. The student should make simple line diagram of the assembly components/circuit and note the provisions for important points adjustments therein.
3. After completing the practical exercise, he must write in his Practical note book using the following heading:
    - Title to include objective of Practical exercise.
    - Tools-Equipments and Materials used (if possible, with specifications).
    - Procedure of performing the Practical including any special precautions to be taken during Dismantling or Reassembling.
    - Examination of Parts, noting methods of adjustments and recording reason for service ability of amount of wear.
    - Conclusion: A report on the general condition of the assembly components including a list of new parts fitted/replaced or recommendation to make the component fit for further service.
    - Safety precautions to be taken while performing the Practicals.
4. In case of any difficulty while performing the Practicals, the Examinee must approach his teacher without hesitation.
5. Proper use of tools.
6. Special consideration be given for skill, workmanship and finish.
7. Records of on-job-training.

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