DEPARTMENT OF MECHANICAL ENGINEERING

ME 8091 – AUTOMOBILE ENGINEERING

QUESTION BANK

UNIT I - VEHICLE STRUCTURE AND ENGINES

Part-A

1. State major types of automobiles according to the fuel used.
2. List any four components of a chassis.
3. Mention any two requirement of an automobile.
4. List any four characteristics of a good chassis.
5. Give any two requirement of good frame.
6. Define cross wind force.
7. State any four functions of lubrication.
8. What are the types of cross sectional frames used in automobile?
9. Name any four air pollutants.
10. What do you mean by Electronic Engine Management system?
11. What are the functions of a frame?
12. What are the forces acting on the running vehicles?
13. What are the functions of a gear box?
14. What are the types of frames?
15. What are the stresses to which the frame members are subjected to?
16. What are the advantages of air-cooled engines?
17. Write down the firing order of a 4 cylinder and 6 cylinder engine.

Part-B

1. Explain the construction of various frames used in automobiles with neat sketch.
2. Draw the layouts of automobile chassis and explain its significance.
3. Explain briefly about the defects in chassis frame.
4. Explain briefly semi integral and integral type vehicle body construction.
5. List the engine parts , materials, methods of manufacture and their functions.
6. Write short notes on the following with respect to vehicle motion.
   i) Aerodynamic drag ii) Gradient resistance iii) Rolling resistance
7. Give reasons
   i). For using single cylinder two stroke petrol engines on two wheelers.
   ii) For using multi cylinder diesel engines in commercial vehicles.
8. Describe in detail on various types of automotive pistons.
9. Explain with suitable sketches and valve timing diagram, the working of a Variable Valve Timing (VVT)system used in automobiles.
10. Explain engine classification based on valve arrangement with a neat diagram.

UNIT II - ENGINE AUXILIARY SYSTEMS

Part-A

1. What is carburetor?
2. What are the requirements of a spark plug?
3. List out the main functions of a battery.
4. What is a variable jet carburetor?
5. What is a Catalyst?
6. What is meant by turbo charging?
7. What are the important units electronic fuel injection system?
8. What are the factors to be considered for comparing magneto and coil ignition system?
9. what is mean by unit injection system?
10. what is an Electronic ignition system?
11. what is rotary distributor?
12. what is the function of the spark plug?
13. What are the functions of Turbo chargers?
14. What are the advantages of electronic fuel injection system over conventional injection?
15. What are the difference between battery coil ignition and magneto ignition system?
16. what is emission of automobile?
17. what is CRDI ?

Part-B

1. Sketch and explain the construction and operation of a simple carburetor.
2. With a schematic layouts explain the multipoint electronic fuel injection system(MPFI).
3. Describe the working of a Common Rail Diesel Injection system with a neat sketch.
4. Explain with a sketch the working of an electronic fuel injection system (any one type).
5. Discuss the Construction and working principles of 3-way Catalytic controller.
6. Explain the operation of the typical turbocharger with sketch.
7. What do you know about emission norms? Discuss.
8. Draw and explain the circuit diagram of electronic ignition system using a magnetic pick-up method.
9. What are the types of electronic ignition systems? Describe any one of them clearly.
10. Explain briefly the main types of supercharging methods.

UNIT III - TRANSMISSION SYSTEMS

Part-A

1. What are the function of clutch?
2. What is the function of Synchromesh unit in a gear box?
3. State the function of differential unit.
4. What are the functions of universal joint?
5. List out the functions of a propeller shaft.
6. Why epicyclic gears are used in overdrive units?
7. Classify gear box.
8. Why is double clutching technique used?
9. How torque converter gearbox differs from fluid flywheel?
10. State the phenomenon of torque multiplication.
11. What is mean by fluid fly wheel?
12. Define traction effort?
13. What are the types of clutch?
14. What is Hotchkiss drive and Torque Tube drive?
15. State the functions of a slip joint.
16. What is meant by differential lock?
17. What is transfer box? Where it is used?
18. Why Synchronizer is required in the automotive transmission system?

Part-B

1. What is meant by clutch? List out the requirements.
2. Explain the working of a single plate clutch with a diagram.
3. Describe the construction and working of an overdrive with a neat sketch and list out its advantages.
4. Explain the working principle of fluid fly wheel with the help of a sketch.
5. What is torque converter? Explain its working principle with suitable diagram.
6. Explain briefly the construction of the propeller shaft with neat sketch.
7. Explain the sliding mesh gearbox with a suitable sketch.
8. Discuss the construction and operation of a constant mesh gear box.
9. Explain the principle and working of a differential with a neat sketch.
10. What are the types of rear axle drive? And explain with a neat sketch.

UNIT – IV STEERING BRAKES AND SUSPENSION SYSTEMS

Part-A

1. List out the types of front axle.
2. What is meant by bleeding of brakes?
3. Classify independent rear suspension system.
4. What are the functions of suspension system?
5. Define slip angle.
6. Define overall steering ratio.
7. What is meant by centre point steering?
8. Define caster angle.
9. Classify wheel balancing.
10. What are the advantages of wire wheel over disc wheel?
11. What is the purpose of Toe-in and Toe-out?
12. Define king pin inclination.
13. Define castor and camber.
14. Draw at least any two types of stub axles**.**
15. Compare disc and drum brakes.
16. What is meant by traction control?
17. Name the classification of brake system.

Part-B

1. What is castor, camber and King pin inclination with respect to wheel geometry?
2. List down the various components of a steering system.
3. What are the different types of steering gears used in an automobile?
4. Explain independent suspension system with neat sketches.
5. With an aid of neat sketch, explain the working principle of pneumatic suspension system.
6. Explain the operation of a telescopic type shock absorber with a sketch.
7. Explain the working principle of power steering system with neat sketch.
8. Explain the construction and operation hydraulic braking system with a sketch.
9. What is the working principle of antilock braking system? Explain with neat sketch.
10. Draw the schematic diagram of pneumatic braking system and explain it.

UNIT – V ALTERNATIVE ENERGY SOURCES

Part-A

1. What is meant by a fuel cell and how it works?
2. List down the properties of alternate fuels.
3. State any two advantages of methane as fuel in automobiles.
4. What is meant by reformulated and oxygenated gasoline?
5. What i s meant by reversible fuel cell?
6. Mention the various methods of storing hydrogen.
7. What is meant by transesterification?
8. Why biodiesel mixed with conventional diesel?
9. How can be fermentation process defined?
10. What are the advantages and limitations of alcohols are engine fuel?
11. What are the alternative fuels available?
12. What is the composition of nature gas?
13. What does B100 refer?
14. What is meant Gasohol?
15. What is meant by a fuel cell and how it works?
16 Define volatility.
17. What are the various properties of gaseous fuel?
18. Define flame speed.
19. What are the main components of electric and hybrid vehicles?
20. Define detonation and pre-ignition.

Part-B

1. Explain the engine modification required to use alternate fuels in automobile.
2. Explain the various properties of alternative fuels.
3. Explain the production of nature gas with a neat sketch in details.
4. Explain the various significance of CNG conversion kit used in S.I. engines.
5. Explain the fuel characteristics Alcohols, CNG, LPG and hydrogen.
6. Describe the salient feature of using LPG as an alternate fuel.
7. Explain in detail about the electrical vehicle system with a block diagram.
8. Explain the different types of hybrid vehicles with neat sketch..
9. Explain with a neat sketch PEM based fuel and its working.
10. Discuss the principle of operation of a fuel cell with a neat sketch and explain briefly the applications of fuel cells.