AAE (22440) Sample Questions

● Unit 1: 12 Marks

1. Draw P-ω diagram showing stages of combustion in CI engine. 6m
2. Draw P-ω diagram showing stages of combustion in SI engine. 6m
3. What is delay period? State the variables affecting delay period. 4m/6m
4. What is diesel knock? How it is controlled? 4m
5. State the methods of improving fuel economy. 2m
6. Compare S.I. and C.I. engine on the basis of : 6m
   (i) Compression ratio
   (ii) Operating speed
   (iii) Power o/p per weight.
7. Write any four Engine variables affecting Ignition Lag. 4M
8. Describe effects of detonation in SI engine. 4m
9. What is ignition limit? Give ignition limit for CI engine. 4m
10. What is ignition limit? Give ignition limit for SI engine. 4m
11. Write air fuel ratio in CI engine under Idle and Full Load Condition. 4m
12. List four pollutants emitted from SI engine. 2m
13. What is Detonation? How is it controlled? 4m
14. Write any four Engine variables affecting Flame Propagation. 4m
15. Draw a neat sketch of any one Direct-Injection type combustion chamber.
16. Define: 1) Detonation
    2) Pre-ignition
    3) Surface Ignition
    4) Abnormal Combustion
17. List types of combustion chamber in SI engine. Explain any one in detail with a neat ketch. 4m
18. Compare C.I. and S.I. engine on the basis of thermodynamic and operating variables. 6m
19. State how air-fuel ratio in diesel engine varies from no load to full load. 4m
20. List four types of Direct Combustion (Open) chambers used in CI engine. 2m
21. Select the combustion chamber for racing car/ auto-rikshaw/ bike engine with justification. 4m

● Unit 2: 16 Marks

1. Compare TBI and PFI system. 4m
2. Give any four sensors used in MPFI system. 4m/2m
3. State the drawbacks of carburetted (SI) engines on the basis of fuel distribution, emission, power output and fuel consumption. 4m/6m
4. Name the sensors that are placed at intake manifold, throttle valve, water jacket and exhaust manifold. 2m/4m
5. With a suitable sketch explain the working of Fuel Injector. 4m/6m
6. List methods of fuel injection and explain any one of them with a neat sketch. 4m/6m
7. Compare TBI and PFI system of the fuel supply with justification for the following parameters. 6m
8. Describe the procedure for diagnosis fault in a sensor of Multi-Point Fuel Injection Engine. 4m/6m
9. Explain working of fuel pressure regulator of multiport fuel injection engine with suitable sketch. 4m
10. Describe Idle Speed control as an output function of multi–port fuel Injection with the help of sketch. 6m
11. Describe Canister Purge control as an output function of multi–port fuel Injection with the help of sketch. 6m.

- **Unit 3:** **12 Marks**

1. With a neat sketch write the function of high-pressure accumulator. 4m
2. Draw the block diagram of electronic diesel control unit (EDC). 4m
3. Draw block diagram for CRDI engines and name the parts. 4m
4. Write function of glow plug. Why and where it is used? List it's types.
5. Explain working of CRDI System with the help of sketch. 6m
6. Explain diagnosis procedure of CRDI to diagnosis multipoint fuel injection engine. 4m
7. Write air fuel ratio in CI engine under Idle and Full Load Condition. 2m
8. Describe the working of High-Pressure Fuel Pump used in CRDI system. 6m
9. Describe the working of High-Pressure Accumulator used in CRDI system. 6m
10. Draw the circuit diagram of glow plug and explain its operation. 6m
11. Draw the block diagram of Solenoid Operated Fuel Injector. 4m

- **Unit 4:** **12 Marks**

1. Enlist four properties of diesel. 2m
2. State four properties of SI engine fuel. 4m
3. Explain with block diagram the LPG fuel supply system. 4m/6m
4. Draw a labelled block diagram of CNG conversion kit and describe it's working. 4m/6m
5. Describe the procedure to locate leakage in LPG fuel supply system of car. State the relevant precautions to be taken during leakage identification. 6m
6. Draw a block diagram of series type Hybrid car. State two advantages of Hybrid Car. 4m
7. Draw a block diagram of Electric vehicles. State two advantages of Electric vehicles. 4m
8. Explain the properties; (any four) 4m
   1) Pour Point
   2) Viscosity
   3) Fire Point
   4) Cetane Number
   5) Volatility
   6) Pour Point
   7) Cloud Point
   8) Sulphur
   9) Contamination
   10) Ignition Quality
9. List various fuels used in I.C. Engines. Write properties of bio-diesel fuel. 4m/6m
10. Write difference between LPG & CNG with respect to its calorific value, Compression Ratio, Air Fuel ratio and octane rating. 4m
11. CNG is used as alternative fuel, justify it with 4 merits & 4 demerits. 4m
12. LPG is used as alternative fuel, justify it with 4 merits & 4 demerits. 4m
13. What is a Hybrid vehicle, Explain the working of Series Hybrid vehicle. 4m/6m
14. Write about the need of Hybrid vehicles, also discuss its advantages and disadvantages. 6m
15. Compare LPG & CNG on the basis of
    i. Auto ignition temperature. ii. Calorific Value
    iii. Economy iv. Octane Rating

- **Unit 5:** **4 Marks**

1. State the difference between turbocharger and VGT used in diesel engine. 4m
2. How is VGT beneficial over conventional Turbocharger. 4m
3. Describe the concept Variable Geometry Turbocharger (VGT). 4m
4. Enlist the feature of GDI for a car engine. 4m
5. Describe the concept of Gasoline Direct Injection (GDI). 4m
6. Explain VVT mechanism and state advantages & disadvantages of it. 4m
7. What does VTEC stands for? State its merits and demerits. 4m
8. Describe feature of Variable Valve Timing mechanism (VVT). 4m
9. What does DTSi stands for? State the advantages of DTSI. 4m

- **Unit 6:** **14 Marks**

1. Describe any four methods to improve fuel economy. 4m
2. State the pollutants from gasoline engines. And explain why it is formed? 4m
3. State the pollutants from gasoline engines. 2m
4. State the pollutants from Diesel engines. 2m
5. Explain the working of EGR with neat sketch. 4m/6m
6. Describe the working of PCV system. 4m
7. Describe three engine modifications to be done to reduce S.I. engine emission. 6m
8. List sources of pollutants from Gasoline engine. Explain Evaporative Losses in detail. 4m
9. What is Diesel Smoke? State two methods to control Diesel Smoke. 4m
10. Explain types of Diesel Smoke. Explain causes for diesel smoke. 4m
11. Explain Engine design modification parameters to control emission. 6m
12. Prepare a chart of Bharat Stage IV (BSIV)/ Euro norms for petrol engine of Car 4m
13. Prepare a chart of Bharat Stage IV (BSIV)/ Euro norms for diesel engine of Car 4m
14. Describe the operation of EGR valve with suitable sketch. 4m
15. With a neat labelled figure, explain the working of PCV valve in any two positions. 6m
16. List out the methods of evaporation control and explain any one. 4m/6m
17. Write the functions of Canister Purge Control and EGR. 4m
18. Enlist various pollutants from the gasoline engine. State their effect on environment. 2m
19. Describe relevant properties of four constituents in petrol engine exhaust gas. 4m