

## UNIT II ENGINE AUXILIARY SYSTEMS \_ QUESTION BANK

### CHAPTER I -- CARBURETION

#### PART A

- 1) What is Stoichiometric or Chemically correct ratio?
- 2) What is lean mixture? State its properties.
- 3) What is rich mixture?
- 4) Write the purpose of carburetor?
- 5) What is constant vacuum carburetor?
- 6) What is Constant choke carburetor?
- 7) What is Choke valve?
- 8) Define: Idling system?
- 9) What is venture? How it assists for better carburetion?
- 10) What will happen if we supply Diesel in SI Engine?
- 11) What will happen if we supply Diesel in CI Engine?
- 12) What is Equivalence ratio?
- 13) Write the various classification of carburetor?
- 14) What is dieseling?
- 15) Write the disadvantages of a carburetor?
- 16) What is the principle of a carburetor? Name the major parts in it.
- 17) Write the requirements of an engine to give effective combustion?
- 18) What is the output of clean combustion?
- 19) What will be the product of incomplete combustion?
- 20) What is smog?

#### PART B

- 1) Explain the working principle of Simple carburetor?
- 2) Explain the working principle of Constant vacuum type carburetor
- 3) Explain the air fuel ratio requirements with the emission?
- 4) A simple jet carburetor is required to supply 4.6 Kg of air per minute. The pressure and temperature of air are 1.013 bar and 25°C respectively. Assuming flow to be isentropic and compressible and velocity co-efficient as 0.8. Calculate the throat diameter of the choke for air flow velocity of 80 m/s.
- 5) A simple jet carburetor is required to supply 5 kg of air and 0.5 kg of fuel per minute. The fuel specific gravity is 0.75. The air is initially at 1 bar and 300 K. Calculate the throat diameter of the choke for a flow velocity of 100 m/s. Velocity coefficient is 0.8. If the pressure drop across the fuel metering orifice is 0.80 of that of the choke. Calculate orifice diameter assuming  $C_{df}=0.60$  and  $\gamma = 1.4$
- 6) A simple carburetor is designed to supply 6 kg of air per minute and 0.4 kg of fuel per minute. The density of the fuel is 770 kg/m<sup>3</sup>. The air is initially at 1 bar and 17° C. Calculate the venturi throat diameter if the velocity of air at throat is 100 m/s. Assume  $C_{da}=0.84$ .  $C_{df}=0.65$  and  $\gamma=1.4$ . If the pressure drop across the fuel metering orifice is 0.85 of the pressure at the throat.

- 7) A simple carburetor is designed to supply 5.8 kg of air per minute and 0.6 kg of fuel per minute. Specific gravity of fuel is 0.78. The air is initially at 1.013 bar and 18° C. Calculate the venturi throat diameter if the velocity of air at throat is 120 m/s. Assume  $C_{da}=0.84$ .  $C_{df}=0.60$  and  $\gamma=1.4$ . If the pressure drop across the fuel metering orifice is 0.80 of the pressure at the throat.

## **CHAPTER II GASOLINE INJECTION AND IGNITION SYSTEMS**

### **PART A**

1. List the different types of ignition system used in vehicles
2. What is the use of condenser in ignition system
3. What is delay period and what are the factors that affect the delay period?
4. Write down the components of ignition system used in automobiles
5. Write down the possible faults in conventional ignition system
6. Draw the diagram for an ignition coil and name the components
7. what are the various requirement of good carburetor
8. what is the main function of an spark plug
9. Define dwell angle and mention its importance
10. Briefly explain about two types of spark plug used in automobiles
11. List the advantage of Electronic ignition system with conventional type
12. Write down the firing order for four and six cylinder engines
13. List the different types of ignition system used in vehicles
14. What is the use of condenser in ignition system
15. Write down the components of ignition system used in automobiles
16. Write down the possible faults in conventional ignition system

### **PART B**

1. With the aid of a circuit diagram explain the working principles of a battery coil ignition system.
2. Describe the working principles of a centrifugal spark advance mechanism with neat diagram
3. Describe the necessity of the spark advance mechanism in an engine
4. With the aid of a diagram describe vacuum spark advance mechanism
5. Draw the diagram for an ignition coil and name the components
6. With the aid of a circuit diagram explain the working principles of a battery coil ignition system.
7. Describe the working principles of a centrifugal spark advance mechanism with neat diagram
8. Describe the necessity of the spark advance mechanism in an engine
9. With the aid of a diagram describe vacuum spark advance mechanism

## **CHAPTER III DIESEL INJECTION SYSTEM**

### **PART A**

1. What is Air injection system?
2. What is Solid injection system?
3. What is distributor type pump?
4. Write the purpose of governor?
5. Define: Idling system?
6. Write about the principle of carburetor?
7. Write the classification of governor?
8. Write the classification of nozzle?
9. What is the advantages of multi hole nozzle?

10. What is unit injector?
11. What is called injection lag?
12. What is injection timing?
13. What do you mean by atomization?
14. What happens if fuel injected too early?
15. What happens if fuel injected too late?
16. Illustrate various types of nozzle used in Diesel engines.
17. Draw any one type of nozzle and mention its parts.
18. What is transfer pump?
19. What is spill port in fuel injection pump?
20. What is CRDI?
21. What is dripping?
22. What is lift pump?
23. What is the purpose of calibration of injection pump?

## **PART B**

1. Explain the working principle of Distributor pump?
2. Explain briefly about Pintle and Multihole nozzle?
3. Explain with neat sketch about common rail diesel injection system (CRDIS)
4. Explain the working of Unit injector?
5. Explain with neat sketch about the working principle of Simple mechanical governor?
6. Explain the working principle of Jerk type pump?
7. Discuss the air-fuel ratio requirements of a petrol engine from no load to full load.
8. What is the purpose of governor in Diesel engines? Explain the principle and working of pneumatic governor with a neat sketch.
9. Explain various types of combustion chambers used in CI engines with sketches. Also write the merits and demerits.

## **CHAPTER IV INTAKE AND EXHAUST MANIFOLD AND MIXTURE STRENGTH**

### **PART A**

1. What do you mean by intake manifold?
2. What do you mean by Exhaust manifold?
3. List out the types of intake manifold?
4. List out the types of Exhaust manifold?
5. What is muffler?
6. List out the types of muffler.
7. Why the catalys need in a two wheeler?
8. List out the types of catalyst?

## **PART B**

1. Explain the working principle of intake manifold and its components?
2. Explain the working principle of Exhaust manifold and its components?
3. Explain the working principle of types of mufflers?
4. Explain the working principle of exhaust manifold expansion cooling system? 5
- . Explain the working principle of types of exhaust manifold component system?

## **CHAPTER V COOLING AND LUBRICATION SYSTEM**

### **PART A**

- 1) Why the cooling system is necessary in a vehicle?
- 2) Mention the different types of cooling system?
- 3) Name the various types of liquid cooling system?
- 4) Write the disadvantages of air cooling system?
- 5) Write the advantages of liquid cooling system?
- 6) Write the limitations of liquid cooling system?
- 7) What is the purpose of radiator in a liquid cooling system?
- 8) What is pins? Where it is used?
- 9) What is pressure cap? Why is it needed?
- 10) What is thermostat?
- 11) What is the purpose of fan in a liquid cooling system?
- 12) By what material the radiator cooling tubes are made?
- 13) Write the different properties of coolant?
- 14) What is lubrication?
- 15) Why the lubrication system is necessary in a vehicle?
- 16) Mention the different types of lubrication system?
- 17) What is dry sump lubrication?
- 18) What is wet sump lubrication?
- 19) What is crankcase ventilation?
- 20) Write the properties of lubricant?
- 21) Name the additives of lubricant?
- 22) How does the turbocharger helps in altitude compensation?
- 23) Two-stroke engines need higher lubrication system, why?
- 24) What are the causes of overheating and overcooling?
- 25) Write down the major parts to be lubricated in a Petrol engine.

### **PART B**

- 1) Explain the Necessity of cooling system?
- 2) Explain the working principle of thermosyphon cooling system?
- 3) Explain the working principle of forced circulation type cooling system?
- 4) Explain the working principle of Pressurized cooling system?
- 5) Compare air-cooled system with Liquid cooling system?
- 6) Explain about the properties of coolants?
- 7) Explain the requirements of lubrication system?
- 8) Briefly explain with neat sketch about the pressurized lubrication system?
- 9) Explain about wet sump lubrication?

- 10) Briefly explain with neat sketch about the Splash system?
- 11) Briefly explain with neat sketch about the Dry sump lubrication system?
- 12) Explain about properties of lubricants?
13. Explain the following:
- i. Thermosyphon cooling system
  - ii. Forced circulation cooling system
  - iii. Evaporative cooling system
  - iv. Pressure cooling system
14. What are the desired properties of the lubricant? Explain how do additives help to achieve the desired properties.
15. Explain forced cooling system with the components involved in detail.
16. What are the requirements of lubrication system? Also discuss various properties of lubricants.

