

MIZORAM PUBLIC SERVICE COMMISSION
DEPARTMENTAL EXAMINATION FOR JUNIOR ENGINEER
UNDER PUBLIC WORKS DEPARTMENT,
GOVERNMENT OF MIZORAM.
(JULY-2025)

ENGINEERING PAPER
(Mechanical Engineering)

Time Allowed : 3 hours

FM : 100 PM : 40

SECTION - A (Multiple Choice questions) (50 Marks)

All questions carry equal mark of 1 each. Attempt all questions.

*This Section should be answered only on the **OMR Response Sheet** provided.*

1. Compression Ignition (C.I) engine is also known as-
 - (a) Petrol Engine.
 - (b) Diesel Engine
 - (c) Steam Engine
 - (d) Electric Engine
2. Spark Ignition (S.I.) Engine is also known as-
 - (a) Diesel Engine
 - (b) Petrol Engine
 - (c) Steam Engine
 - (d) Electric Engine
3. The advantages of petrol engine over diesel engine is-
 - (a) Better performance
 - (b) Lower cost of fuel
 - (c) Lower initial Cost
 - (d) Lower running cost
4. The main engine cooling systems are-
 - (a) Four types
 - (b) Three types
 - (c) Five types
 - (d) Two Types
5. Which of the following is not a component of a typical Liquid cooling System?
 - (a) Radiator
 - (b) Thermostat
 - (c) Water Pump
 - (d) Air filter
6. What is the function of a thermostat in a liquid cooling System?
 - (a) To control the speed of the cooling fan
 - (b) To regulate the flow of coolant based on engine temperature
 - (c) To increase the pressure of the coolant
 - (d) To lubricate the water pump

7. What is the function of a Pressure relief valve in a lubrication system?
 - (a) To regulate the flow of oil to the engine
 - (b) To prevent the oil pressure from becoming too high
 - (c) To cool the oil
 - (d) To filter the oil
8. Which of the following is common type of oil pump used in lubrication systems?
 - (a) Centrifugal pump
 - (b) Diaphragm pump
 - (c) Gear pump
 - (d) Piston pump
9. A car's headlight suddenly fails. Which of the following is the most likely cause?
 - (a) A blown fuse
 - (b) A dead battery
 - (c) A faulty alternator
 - (d) A loose ground connection
10. A car bounces excessively after hitting a bump which of the following is the most likely cause?
 - (a) A worn shock absorber
 - (b) Worn coil spring
 - (c) A broken sway bar
 - (d) Low tyre pressure
11. What component converts mechanical energy into electrical energy?
 - (a) ECU
 - (b) Ignition Coils
 - (c) Alternator
 - (d) Solenoid
12. A radiator is the container of which of the following liquid?
 - (a) Brake oil
 - (b) Engine oil
 - (c) Gear oil
 - (d) Coolant
13. What is the primary purpose of the air filter?
 - (a) To improve the engine performance
 - (b) To keep dust and debris from entering the engine
 - (c) To cool down the engine
 - (d) To Make the car look nicer
14. In a four stroke Engine, how many revolutions of the Crankshaft does it make to complete One cycle?
 - (a) One
 - (b) Two
 - (c) Three
 - (d) Four
15. Which of the following is not included in daily maintenance of vehicle?
 - (a) Check coolant
 - (b) Check cleanliness of mirror
 - (c) Check Tyre Pressure
 - (d) Check Gear oil
16. What is the function of fins on the cylinder head and block in an air-cooled engine?
 - (a) To increase the surface area for heat dissipation
 - (b) To provide structural support
 - (c) To act as heat sink
 - (d) To improve fuel efficiency

- 17.** What is the function of an oil pump?
- (a) To store the engine oil
 - (b) To filter the engine oil
 - (c) To circulate the oil under pressure
 - (d) To cool the engine oil
- 18.** Which of the following is not a function of lubricants?
- (a) Reduce frictions
 - (b) Cooling
 - (c) Sealing
 - (d) Heating
- 19.** What is the term for the resistance of a fluid to flow?
- (a) Density
 - (b) Flash point
 - (c) Viscosity
 - (d) Pour point
- 20.** What is the full form of BS-VI used in vehicles?
- (a) Bharat State – VI
 - (b) Bharat Standard – VI
 - (c) Bharat Stage – VI
 - (d) Bureau of Standard – VI
- 21.** The advantage of Diesel engine over Petrol Engine is-
- (a) Higher Fuel Efficiency
 - (b) Lesser torque and power at lower RPM's
 - (c) Higher Co2 Emissions
 - (d) Lesser Robust
- 22.** Which of the following is not part of four stroke Engine Cycle?
- (a) Suction
 - (b) Compression
 - (c) Expansion
 - (d) Scavenging
- 23.** In a petrol engine what does the term MPFI stand for-
- (a) Mechanical Petrol Fuel Injection
 - (b) Multi Point Fuel Injection
 - (c) Manifold Pressure Fuel Injection
 - (d) Maximum Petrol Fuel Intake
- 24.** What is scavenging in a two stroke Engine?
- (a) The process of compressing the air fuel mixture
 - (b) The process of igniting the air fuel mixture
 - (c) The process of removing exhaust gases and replacing them with fresh charge
 - (d) The process of lubricating the engine
- 25.** What is the function of spark plug in Petrol Engine?
- (a) Mix air -fuel
 - (b) Deliver electric spark to ignite the air - fuel mixture
 - (c) Measure engine temperature
 - (d) Open and close engine valves
- 26.** Which of the following is a consumable electrode in welding?
- (a) Tungsten
 - (b) Carbon
 - (c) Steel Wire
 - (d) Ceramic
- 27.** What is the main function of flux in arc welding?
- (a) Improve arc stability
 - (b) Remove oxide and impurities
 - (c) Provide electrical Insulation
 - (d) Increase the electrode diameter

- 28.** The most commonly used gases in gas welding are-
- (a) Hydrogen and Oxygen
 - (b) Propane and Oxygen
 - (c) Acetylene and Oxygen
 - (d) Methane and Oxygen
- 29.** The blow pipe using in gas welding is also called-
- (a) Mixer
 - (b) Torch
 - (c) Regulator
 - (d) Cylinder
- 30.** Which gas is highly explosive and needs careful handling in gas welding?
- (a) Oxygen
 - (b) Hydrogen
 - (c) Nitrogen
 - (d) Acetylene
- 31.** The most commonly used soldering alloy is a mixture of-
- (a) Lead and Zinc
 - (b) Tin and Zinc
 - (c) Tin and Lead
 - (d) Copper and Lead
- 32.** Which tool is commonly used for soldering small electronic components?
- (a) Gas Torch
 - (b) Blow Lamp
 - (c) Electric Soldering Iron
 - (d) Welding Gun
- 33.** Common flux used in brazing is-
- (a) Rosin
 - (b) Zinc Chloride
 - (c) Borax
 - (d) Lime
- 34.** The primary purpose of preparing a vehicle survey report is to-
- (a) Sell the Vehicle
 - (b) Assess Vehicle Taxes
 - (c) Evaluate condition, damage or value of the vehicle
 - (d) Improve fuel efficiency
- 35.** The purpose of a vehicle repair estimate is to-
- (a) Replace old vehicles
 - (b) Estimate the resale value
 - (c) Determine the cost of repair
 - (d) Improve fuel efficiency
- 36.** Which of the following is not usually included in a vehicle repair estimate?
- (a) Labor Charges
 - (b) Spare parts Cost
 - (c) Fuel Charges
 - (d) Paint and Material Cost
- 37.** The instrument used to measure the outer diameter of cylindrical object is-
- (a) Vernier Height Gauge
 - (b) Micrometer
 - (c) Dial Gauge
 - (d) Bevel Protractor
- 38.** A bevel protractor is used to measure-
- (a) Internal Diameter
 - (b) Straightness
 - (c) Angles
 - (d) Thread pitch

- 39.** A feeler Gauge is used to measure:
- (a) Thickness of Gaps or Clearances
 - (b) Diameter
 - (c) Height
 - (d) Radius
- 40.** What is vehicle log book used for?
- (a) To record radio stations
 - (b) To store spare keys
 - (c) To keep track of vehicle usage, milage and maintenance
 - (d) To check driving license
- 41.** Which of the following is typically recorded in a car diary?
- (a) Daily Horsepower
 - (b) Number of Passengers
 - (c) Trip start and end location, date and distance
 - (d) Vehicle fitness
- 42.** A vehicle history sheet typically includes all except-
- (a) dates of Services
 - (b) types repair done
 - (c) road condition during trips
 - (d) name of workshop
- 43.** The electrode used in TIG welding is-
- (a) Consumable
 - (b) Coated
 - (c) Non-consumable
 - (d) Made of copper
- 44.** The heat of the TIG Welding is produced by-
- (a) Friction
 - (b) Gas Combustion
 - (c) Electric arc between a tungsten electrode and the workspace
 - (d) Laser Beam
- 45.** Arc welding is a type of-
- (a) Solid-state Welding
 - (b) Fusion Welding
 - (c) Resistance Welding
 - (d) Pressure Welding
- 46.** What is the heat source in Arc welding?
- (a) Friction
 - (b) Resistance Heating
 - (c) Chemical Reaction
 - (d) Electric Arc
- 47.** The colour of Oxygen Gas cylinder in Gas welding is-
- (a) Blue
 - (b) Black
 - (c) Orange
 - (d) Red
- 48.** The Colour of acetylene Gas cylinder in Gas Welding is-
- (a) Black
 - (b) Yellow
 - (c) Maroon
 - (d) Blue

49. The Component that controls the gas flow to the torch is called-

- (a) Mixture
- (b) Valve
- (c) Tip
- (d) Regulator

50. Which of the following is not a type of welding?

- (a) TIG Welding
- (b) MIG Welding
- (c) Gas Welding
- (d) Lathe Welding

Section - B (50Marks)

*This Section should be answered only on the **Answer Sheet** provided.*

Marks for each question is indicated against it.

1. Name the two types of Hot Mix Plant. (2)
2. State two points of difference between Static Road Roller and Dynamic Road Roller? Give one example each. (2)
3. Explain the following types of machine maintenance: - (4×3=12)
 - (a) Preventive Maintenance
 - (b) Corrective Maintenance
 - (c) Condition Base Maintenance
 - (d) Predictive Maintenance
4. Explain in brief the working principle of the following machineries: - (3×2=6)
 - (a) Backhoe Loader
 - (b) Excavator
 - (c) Bull Dozer
5. Write the three points of differences between Diesel Engine and Petrol Engine? (3)
6. Explain the following briefly: - (4×2=8)
 - (a) Arc welding
 - (b) Gas Welding
 - (c) Brazing
 - (d) Soldering
7. Write two points of differences between Gas Welding and Arc Welding. (4)
8. $P=A/X+B/Y$ is the equation for calculation of total depreciation value in condemnation of machineries and equipment's what do A, B, X and Y Stand for? (4)
9. True or False: - (9×1=9)
 - (a) A Tandem Road Roller is of vibratory type.
 - (b) An Excavator bucket capacity is usually expressed in terms of cubic meter.
 - (c) MIG Welding stands for Metal Inert Gas welding.
 - (d) A micrometer is a tool for precision measurement to Gauge long distance.
 - (e) Arc welding uses the heat generated by an electric arc to melt and join metal pieces

- (f) Car Diary and Log Book are mandatory documents for condemnation of Machineries and vehicles.
- (g) A bevel Protractor can measure angles from 0° - 180°
- (h) Soldering is commonly used for electronics circuit boards
- (i) Soldering is used in refrigeration systems, air conditioners and gas lines.

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