## SCHEME & SYLLABUS FOR RECRUITMENT TO THE POST OF SERVICE ENGINEERS IN A.P. MEDICAL & HEALTH TRANSPORT SERVICE

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<th>Maximum Marks</th>
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### SYLLABUS:

**GENERAL STUDIES**

1. **SCIENCE AND TECHNOLOGY:**
   - (a) General Science and Technology
   - (b) Role and impact of Science and Technology on India’s development.

   (Questions will cover general appreciation and understanding of matters of everyday observation and experience as may be expected of a well-educated person who has not made a special study of Science and Technology disciplines.)

2. **INDIAN HISTORY AND CULTURE:**
   - (a) Modern Indian History from 19th century to the present.
   - (b) Nationalist Movement and Constitutional development.
   - (c) Indian culture and Heritage including Architecture, Fine Arts, Dance forms, Music, Paintings, Folk Arts and Performing Arts.
   - (d) History of Andhradesa Society, culture, Geography and Economic Development.

3. **INDIAN POLITY:**
   
   General and broad understanding of the structural (institutions) and functional (Processes) aspects of Indian Political system

4. **INDIAN ECONOMY AND GEOGRAPHY OF INDIA:**
   - (a) Structure of National Economy.
   - (b) Economic development (including planning) since Independence.
   - (c) Economic Reforms.
   - (d) Physical, Economic and Social Geography of India.

5. **CURRENT EVENTS:**
   
   Current Events of Regional, National and International importance

6. **GENERAL MENTAL ABILITY (reasoning and analytical abilities)**
MECHANICAL ENGINEERING

1. THERMODYNAMICS:


2. HEAT TRANSFER:


3. REFRIGERATION AND AIR-CONDITIONING:

Heat pump, refrigeration cycles and systems, refrigerants, condensers, expansion devices, psychometry, charts and application to air-conditioning, sensible heating and cooling. Effective temperature, comfort indices, load calculations. Solar-refrigeration, duct design.

4. STEAM GENERATORS AND TURBINES


5. THEORY OF MACHINES:

Kinematic and dynamic analysis of planar mechanisms, hooke’s joint, steering gear mechanisms, cams, gears and gear trains. Flywheels, governors, balancing of rotating masses, balancing of single and multi-cylinder engines. Linear vibrations of mechanical systems, transmissibility and vibration isolation. Critical speeds, two-rotor and three-rotor systems.

6. MACHINE DESIGN:


7. PRODUCTION ENGINEERING:


8. INDUSTRIAL ENGINEERING:


9. ELEMENTS OF COMPUTATION:


PAPER-II: AUTOMOBILE ENGINEERING

1. ENGINE TYPES AND CONSTRUCTION FEATURES

Components of four-wheeler automobiles, chassis and body-power unit- power transmission- rear wheel drive, front wheel drive, four-wheel drive- types of automobile engines and engine construction.

2. LUBRICATION SYSTEMS

Engine lubrication, splash and pressure lubrication systems, oil filters, oil pumps-crank case ventilation- engine service, reboring, decarbonisation, nitriding of crank shafts.

3. FUEL SYSTEM- SI ENGINES

Fuel supply systems, mechanical and electrical fuel pumps- filters- carburettors- types- m air filters- petrol engines- petrol injection.

4. FUEL SYSTEM- CI ENGINES

Requirements of diesel injection systems, types of injection systems, fuel pump, nozzle, spray formation, injection timing, testing of fuel pumps.

5. COOLING SYSTEM

Cooling requirements, air-cooling, liquid-cooling, thermo, water and forced circulation systems- radiators- types- cooling fan- water pump, thermostat, evaporating cooling- pressure sealed cooling, anti-freeze solutions.

6. IGNITION SYSTEM

Function of an ignition system, battery ignition system, constructional features of storage, battery, auto-transformer, contact breaker points, condenser and spark plug- magnetocoil ignition system, electronic ignition system using contact breaker, electronic ignition using contact triggers- spark advance and trigger retard mechanism.
7. ELECTRICAL SYSTEM

Charging circuit, generator, current-voltage regulator- starting system, bendix drive mechanism solenoid switch, lighting systems, horn, wiper, fuel gauge – oil pressure gauge, engine temperature indicator etc.

8. TRANSMISSION SYSTEM

Clutches, principle, types, cone clutch, single plate clutch, multi-plate clutch, magnetic and centrifugal clutches, fluid flywheel- gear boxes, types, sliding mesh, construct mesh, synchro mesh gear boxes, epicyclic gear box, overdrive torque converter. Propeller shaft- Hoacht- kiss Drive, Torque tube drive universal joint, differential rear axles – types- wheels and tyres.

9. STEERING SYSTEM

Steering geometry – camber, castor, king pin rake, combined angle toe in, centre point steering. Types of Steering mechanism- Ackerman Steering Mechanism, Davis Steering Mechanism, Steering gears- types, steering linkages.

10. SUSPENSION SYSTEM

Objects of suspension systems – rigid axle suspension system, torsion bar, shock absorber, independent suspension system.

11. BRAKING SYSTEM

Mechanical brake system, Hydraulic brake system, master cylinder, wheel cylinder tandem master cylinder. Requirement of brake fluid. Pneumatic and vacuum brakes.

12. EMISSION FROM AUTOMOBILES

Emission from automobiles – pollution standards- National and International- Pollution Control- Techniques – Noise Pollution and Control.

13. MAINTENANCE

Maintenance- general, preventive and daily.

14. LATEST TRENDS

Electronic Ignition, PCBS, Direct Injection, MPFI, Electronic warning systems with aid of sensors, alternators, CNG conversion, repowering.

15. RUNNING MECHANISM & DRIVING SKILLS

Running mechanism and driving skills.

16. OVERHAULING OF UNITS

Engine-transmission-cooling-electrical, brake systems, etc.

Sd/- Adhar Sinha, IAS.,
SECRETARY

//f.b.o.//

ASSISTANT SECRETARY