Haryana Public Service Commission

Bays No. 1-10, Block-B, Sector-4, Panchkula

Announcement

It is hereby announced for the information of candidates who have applied for the post of Motor Vehicle Officer in Transport Department, Haryana in response to advertisement No. 41/2024 that the Scheme/Pattern of exam and Syllabus is as under:-

Scheme/ Pattern of Exam :-

1. Screening Test

a) Total number of MCQs: 100
b) Total Marks: 100.
c) Time duration of the exam: 02 hours.
d) All questions carry equal marks.
e) Each question will have five options. The fifth option will be meant for a situation where a candidate intends to leave the question un-attempted.
f) One-fourth mark will be deducted for each wrong answer.
g) In case a candidate neither attempts a question nor darkens the fifth option/bubble, then One-fourth mark will be deducted for each such question.
h) Any candidate not darkening any of the five circles in more than 10% questions shall be disqualified
i) The question paper will be in English.
j) A candidate will have to secure a minimum of 25% marks to clear the screening test.
k) Candidates four times the number of advertised posts will be called for the next stage of selection process, provided that they have secured the minimum cut-off marks of 25%.
l) The marks obtained by the candidates in the screening test will not be counted for final selection because it is meant only for shortlisting of candidates.

2. Subject Knowledge Test

a) Time duration of exam: 03 hours
b) Syllabus is detailed below.
c) The medium of exam will be English.
d) Total Marks: 150
e) Paper will be subjective type.
f) No candidate will be called for the interview /viva-voce unless she/he secures a minimum of 35% marks in the test.
g) The number of the candidates called for interview will be two times, including bracketed candidates if any, of the number of advertised posts provided that they have secured the minimum cut-off marks of 35%.
h) The weightage of the Subject Knowledge Test will be 87.5%.

3. Interview

a) The weightage of the interview will be 12.5%.

4. The final merit list will be prepared by adding the marks of the Subject Knowledge Test and interview.

5. **Date of Screening Test: 08.09.2024.**

Syllabus for the post of Motor Vehicle Officer in Transport Department, Haryana is as under :-

Section 1: Applied Mechanics and Design

Engineering Mechanics: Free-body diagrams and equilibrium; friction and its applications including rolling friction, belt-pulley, brakes, clutches, screw jack, wedge, vehicles, etc.; trusses and frames; virtual work; kinematics and dynamics of rigid bodies in plane motion; impulse and momentum (linear and angular) and energy formulations; Lagrange's equation.

Mechanics of Materials: Stress and strain, elastic constants, Poisson's ratio; Mohr's circle for plane stress and plane strain; thin cylinders; shear force and bending moment diagrams; bending and shear stresses; concept of shear centre; deflection of beams; torsion of circular shafts; Euler's theory of columns; energy methods; thermal stresses, strain gauges and rosettes; testing of materials with universal testing machine; testing of hardness and impact strength.

Theory of Machines: Displacement, velocity and acceleration analysis of plane mechanisms; dynamic analysis of linkages; cams; gears and gear trains, flywheels and governors; balancing of reciprocating and rotating masses; gyroscope.

Vibrations: Free and forced vibration of single degree of freedom systems, effect of damping; vibration isolation; resonance; critical speeds of shafts.

Machine Design: Design for static and dynamic loading; failure theories; fatigue strength and the S-N diagram; principles of the design of machine elements such as bolted, riveted and welded joints; shafts, gears, rolling and sliding contact bearings, brakes and clutches, springs.

Section 2: Fluid Mechanics and Thermal Sciences

Fluid Mechanics: Fluid properties, fluid statics, forces on submerged bodies, stability of floating bodies; control-volume analysis of mass, momentum and energy; fluid acceleration; differential equations of continuity and momentum; Bernoulli's equation, dimensional analysis: viscous flow of incompressible fluids, boundary layer, elementary turbulent flow, flow through pipes, head losses in pipes, bends and fittings; basics of compressible fluid flow.

Heat-Transfer: Modes of heat transfer, one dimensional heat conduction, resistance concept and electrical analogy, heat transfer through fins; unsteady heat conduction, lumped parameter system, Heisler's charts; thermal boundary layer, dimensionless parameters in free and forced convective heat transfer, heat transfer correlations for flow over flat plates and through pipes, effect of turbulence; heat exchanger performance, LMTD and NTU methods; radiative heat transfer, Stefan- Boltzmann law, Wien's displacement law, black and grey surfaces, view factors, radiation network analysis

Thermodynamics: Thermodynamic systems and processes; properties of pure substances, behavior of ideal and real gases, zeroth and first laws of thermodynamics, calculation of work and heat in various processes; second law of thermodynamics, thermodynamic property charts and tables, availability and irreversibility, thermodynamic relations.

Applications. Power Engineering: Air and gas compressors, vapour and gas power cycles, concepts of regeneration and reheat. I.C. Engines: Air-standard Otto, Diesel and dual cycles. Refrigeration and air-conditioning. Vapour and gas refrigeration and heat pump cycles; properties of moist air, psychrometric chart, basic psychrometric processes. Turbo machinery. Impulse and reaction principles, velocity diagrams, Pelton-wheel, Francis and Kaplan turbines, steam and gas turbines.

Section 3: Materials, Manufacturing and Industrial Engineering

Engineering Materials: Structure and properties of engineering materials, phase diagrams, heat treatment, stress-strain diagrams for engineering materials.

Casting, Forming and Joining Processes: Different types of castings, design of patterns, moulds and cores; solidification and cooling; riser and gating design. Plastic deformation and yield criteria; fundamentals of hot and cold working processes, load estimation for bulk (forging, rolling, extrusion, drawing) and sheet (shearing, deep drawing, bending) metal forming processes; principles of powder metallurgy. Principles of welding, brazing, soldering and adhesive bonding.

Machining and Machine Tool Operations: Mechanics of machining, basic machine tools; single and multi-point cutting tools, tool geometry and materials, tool life and wear; economics of machining; principles of non-traditional machining processes; principles of work holding, jigs and fixtures; abrasive machining processes; NC/CNC machines and CNC programming.

Metrology and Inspection: Limits, fits and tolerances; linear and angular measurements; comparators; interferometry; form and finish measurement; alignment and testing methods; tolerance analysis in manufacturing and assembly; concepts of coordinate-measuring machine (CMM).

Computer Integrated Manufacturing: Basic concepts of CAD/CAM and their integration tools; additive manufacturing.

Production Planning and Control: Forecasting models, aggregate production planning, scheduling, materials requirement planning; lean manufacturing.

Inventory Control: Deterministic models; safety stock inventory control systems.

Operations Research: Linear programming, simplex method, transportation, assignment, network flow models, simple queuing models, PERT and CPM.

Dated:- 05/08/2024

Deputy Secretary
Haryana Public Service Commission
Panchkula