ANDHRA PRADESH PUBLIC SERVICE COMMISSION: HYDERABAD

NOTIFICATION NO.23/2016, Dt.17/12/2016

INSPECTOR OF FACTORIES IN A.P. FACTORIES SERVICE
(GENERAL RECRUITMENT)

EDUCATIONAL QUALIFICATIONS:

Applicants must possess the qualifications from a recognized University as detailed below or equivalent thereto, subject to various specifications in the relevant service rules and as per the indent received from the Department as on the date of notification.

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<tr>
<th>Sl. No</th>
<th>Name of the Post</th>
<th>Educational Qualifications</th>
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<tr>
<td>01</td>
<td>Inspector of Factories in A.P. Factories Service.</td>
<td>Must possess a Degree in Mechanical or Electrical or Chemical or Industrial Engineering of a University in India established or incorporated by or under Central Act, Provincial Act or a State Act or an institution recognized by the University Grants Commission or an equivalent qualification. Must have minimum 2 years industrial work experience in the medium and large scale manufacturing process industries preferably in the field of Industrial Safety, Occupational Safety, Health &amp; Environment Management. The experience certificate shall be issued by the Chief Executive of the concerned Industry in which the applicant is employed.</td>
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SCHEME AND SYLLABUS FOR THE POST OF INSPECTOR OF FACTORIES IN A.P. FACTORIES SERVICE (Degree Standard)

<table>
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<th>SCHEME</th>
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<tbody>
<tr>
<td>WRITTEN EXAMINATION (Objective Type)</td>
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<tr>
<td>PAPER - 1 GENERAL STUDIES AND MENTAL ABILITY</td>
</tr>
<tr>
<td>PAPER - 2 Subject: MECH or ELE or CHEM or INDUSTRIAL ENGINEERING.</td>
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<td>TOTAL</td>
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NEGATIVE MARKS: As per G.O.Ms. No.235, Finance (HR-I, Plg & Policy) Dept., Dt. 06/12/2016, for each wrong answer will be penalized with 1/3’rd of the marks prescribed for the question.

SYLLABUS

GENERAL STUDIES AND MENTAL ABILITY

1. Events of national and international importance.
2. Current affairs- international, national and regional.
3. General Science and it applications to the day to day life Contemporary developments in Science & Technology and Information Technology.
4. Social- economic and political history of modern India with emphases on Indian national movement.
5. Indian polity and governance: constitutional issues, public policy, reforms and e-governance initiatives.
6. Economic development in India since independence.
7. Geography of India with focus on Andhra Pradesh.
8. Disaster management: vulnerability profile, prevention and mitigation strategies, Application of Remote Sensing and GIS in the assessment of Disaster
9. Sustainable Development and Environmental Protection
10. Logical reasoning, analytical ability and data interpretation.
11. Data Analysis:
   - Tabulation of data
   - Visual representation of data
   - Basic data analysis (Summary Statistics such as mean and variance coefficient of variation etc..) and Interpretation
12. Bifurcation of Andhra Pradesh and its Administrative, Economic, Social, Cultural, Political, and legal implications/problems, including
   a). Loss of capital city, challenges in building new capital and it’s financial implications.
   b). Division and rebuilding of common Institutions.
   c). Division of employees, their relocation and nativity issues.
   d). Effect of bifurcation on commerce and entrepreneurs.
   e). Implications to financial resources of state government.
   f). Task of post-bifurcation infrastructure development and opportunities for investments.
   g). Socioeconomic, cultural and demographic impact of bifurcation.
   h). Impact of bifurcation on river water sharing and consequential issues.

1. MECHANICAL ENGINEERING


7. **THERMODYNAMICS**: Basic Concept. Open and closed systems, Applications of thermo-dynamic Laws, Gas equations, Clapeyron equation, Availability, Irreversibility and Ts relations.


10. **Turbo-Machines and Power Plants**: Continuity, momentum and Energy Equations, Adiabatic and isentropic flow, fanno lines, Rayleigh lines. Theory and design of axial flow turbines and compressors. Flow through turbo-machine blade, cascades, and centrifugal compressor. Dimensional analysis and modeling. Selection of site for steam, hydro, nuclear and stand-by power plants. Selection base and peak load power plants, Modern High pressure, High duty boilers, Draft and dust removal equipment, Fuel and cooling water systems, heat balance, station and plant heat rates, operation and maintenance of various power plants, preventive maintenance, economics of power generation.

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2. **ELECTRICAL ENGINEERING**

**Circuits, Instruments and Machines:**


4. Transformers: Principles of operation – constructional details of single and polyphase transformers – core, tank and other auxiliaries – operation on no load and load – phasor diagram – regulation and efficiency – All-day efficiency 3 Phase to two phase conversion – Choice of insulation – testing of transformers as per I.S.I.

**Power generation, transmission, distribution and utilisation:**

5. Fault calculations and reactors: Per unit system – Choice of base values symmetrical components and application to symmetrical and unsymmetrical faults – reactors and their methods of usage – testing of reactors.

**3. CHEMICAL ENGINEERING**


(g) Material and Energy balances : Material and energy balance calculations in processes with recycle/bypass/purge. Combustion of solid/liquid/gaseous fuels, stoichiometric relationships and excess air requirements. Adiabatic flame temperature.


4. INDUSTRIAL ENGINEERING

1. Theory of Machines:
   Kinematic and dynamic analysis of planar mechanisms, Gams, Gears and gear trains, Flywheels, Governors, Balancing of rigid motors, Balancing of single and multi cylinder engines, Linear vibration analysis of mechanical systems (single degree and two degrees of freedom), Critical speeds and whirling of shafts, Automatic Controls, Belts and chain drives. Hydrodynamic bearings.

2. Mechanics of Solids
   Stress and strain in two dimensions. Principal stresses and strains, Mohr’s construction, linear elastic materials, isotropy and an isotropy, Stress-strain relations, uniaxial loading, thermal stresses. Beams: bending moment and shear force diagrams, bending stresses and deflection of beams, shear stress distribution. Torsion of shafts, helical springs. Combined stresses, Thick and thin walled pressure vessels. Struts and columns, strain energy concepts and theories of failure. Rotating discs, Shrink fits.

3. Engineering Materials

4. Manufacturing Science
   Merchant’s force analysis, Taylor’s tool life equation, machine ability and machining economics, Rigid small and flexible automation, NC, CNC, Recent machining methods – EDM, ECM and ultra sonics. Application of lasers and plasmas, analysis of forming processes. High-energy rate forming jigs, fixtures, tools and gauges, inspection of length, position, profile and surface finish.

5. METROLOGY AND INSTRUMENTATION

   Elements of instrumentation system. Static and dynamic characteristics. Dynamic response of first order and second order instruments. Types of error. Displacement transducers LVDT.
6. **Production Management:**
   Production planning and control, Forecasting Moving average, exponential smoothing, Operations scheduling; assembly line balancing. Product development Breakeven analysis, Capacity planning PERT and CPM.

7. **Operations Research:**
   Linear programming – graphical method, Simplex, Revised Simplex and Dual Simplex methods. Duality and economic interpretation of dual variables.


8. **Material Management:** Role of material planning. EOQ inventory, control (deterministic and probabilistic models) MRP – 1 (Inputs& Outputs) MRP-2 Material handling equipment (Selection, Classification, types) ABC analysis. Industrial Robots.

9. **Work Study:** Procedure of method study, various charts used in method study principals of motion of economy. Work place design, ergonomics.

   **Time Study:** Calculation of standard time. Performance rating types of ratings, work sampling, types of incentive financial and non-financial. Different wage payment plans.


    **Costing:** Elements of costs. Types over heads and overhead distribution. Break even analysis and its calculation. Description and its methods.

11. **Plant maintenance (objective importance).** Types of maintenance (break down, preventive, scheduled, predictive) plant maintenance schedule. Recent development in plant maintenance techniques, conditioning monitoring.

    Replacement analysis (Reasons and factors considered for equipment replacement) methods like MAPI.


   Sd/-
   SECRETARY