KPSC DRAFT SYLLABUS FOR WRITTEN EXAMINATION FOR THE RECRUITMENT OF LECTURERS IN DEPT OF MECHANICAL ENGINEERING (INSTRUMENTATION)

1. **Strength of Materials:** Stress and strain, stress-strain relationship and elastic constants, Mohr's circle for plane stress and plane strain, shear force and bending moment diagrams, bending and shear stresses, deflection of beams, torsion of circular shafts, Euler's theory of columns, strain energy methods, thermal stresses, thick cylinders and thin cylinders.
2. **Theory of Machines:** Basics KOM, friction, power transmission, mechanical vibrations, gear trains, flywheels, cams, balancing of rotating masses and governors.
3. **Fluid mechanics**
   Properties of fluid, Fluid statics, Fluid dynamics, Fluid flow measurements, Flow through pipes.
4. **Mechanical Engineering Science** .Properties of metals. Meaning of chemical, thermal, electrical, magnetic and mechanical properties of metals , Ductility, hardness, toughness, brittleness, impact, malleability, elasticity, plasticity etc. Ferrous metals Non Ferrous metals Heat treatment of steels
5. **Manufacturing technology – I** Materials for manufacturing. Manufacturing Ferrous and non-ferrous materials., Heat treatment, Carbon Equilibrium diagram. Review of heat treatment processes, Advanced materials used in manufacturing, Ceramics, Polymers, Plastics, Composite materials.
6. **Manufacturing technology – II**
   Introduction: Metal Removal Processes, Types Of Machine Tools – Theory Of Metal Cutting: Chip Formation, Orthogonal Cutting- Oblique Cutting- Mach inability of metal. Cutting Tool-Classification of cutting tools-Single point Cutting Tool Geometry-Cutting Tool Materials, Tool Wear, Tool Life, and Cutting Fluids-Functions and properties., Centre Lathe-Construction- Various Operations, Taper Turning Methods, Thread Cutting operation, Lathe Attachments & Accessories. Capstan and Turret Lathes, Shaper -Principal parts, Classification, Types-Hydraulic shaper. Cutting Speed, Feed, Depth of cut & machining time-Various shaper operations-Introduction to Planer -Principal parts and working of Double housing Planer, Principal parts of Slotter-Working of slotter
7. **Metrology and inspection**
   Need of inspection, Process of measurement, Process of measurement, Methods of measurement, Measuring system, Accuracy of measurement, Precision and accuracy, Distinction between precision and accuracy, Factors affecting the accuracy of the measuring system, Sensitivity, Readability, Calibration, Magnification, Repeatability, Reproducibility, Errors in measurement, Types of errors, Imperial standard Yard, International standard Meter, Line standards End standards, Comparison between line and end standard, Characteristics of end standards
8. **Industrial instrumentation-1**
   Define the term instrumentation, system, measurement, control, State the methods of measurement, Explain mechanical type, electrical type, electronic type, Discuss the primary measurement, Secondary measurement, tertiary measurement, Define the term-accuracy,, sensitivity, linearity, hysterisis, precision, frequency response, Methods of

temperature measurement, pressure measurement, strain gauge pressure transducer ,low pressure gauges.

9. **Industrial instrumentation – II**

Force Measurement, Introduction, basic methods of Force Measurement, Torque Measurement, torque reaction methods, strain gauge torsion method, stroboscopic method, optical torsion meter, electrical torsion meter. Shaft Measurement power, classification, rope brake, prony brake, hydraulic Dynamometers eddy current D.C Dynamometers, A.C Dynamometers, servo controlled Dynamometers, Instantaneous measurement of power, Transducers classification, Transducers sensitivity, variable resistance Transducers, variable inductance Transducers, LVDT, capacitive Transducers, piezo-electric Transducers, wheat-stone bridge circuit, potentiometers. Introduction, classification of Control Systems, Control Systems terminology, servo mechanism, process Control & regulators

10. **Industrial maintenance** Scope of Maintenance, Maintenance Objectives ,Functions and Responsibilities of Maintenance Department ,Maintenance Types and Systems Maintenance Types and Systems ,Introduction ,Breakdown Maintenance, Corrective Maintenance, Routine Maintenance ,Preventive Maintenance, Condition based maintenance system [CBMS or CBM]