DETAILED SYLLABUS FOR THE POST OF TRADESMAN (SMITHY) IN TECHNICAL EDUCATION DEPARTMENT

(Cat.No.: 277/2025)

Module -1 : Safety and forging tools (20 marks)

Safety – (PPE, basic first aid, fire extinguisher), Fuels used in forge shop, Anvil, swage block, tongs, hammers, chisels, sawing - (method of sawing, frames and blade), centre punches and dot punch. Measuring and marking tools used in forging, Files classification, Selection of Files for proper work, Equipment and tools used in Fitting shop. (Vice, marking Tools, measuring tools– steel rule, brass rule, callipers).

Module -2 : Ferrous metals and non-ferrous metals (20 marks)

Metals –Ferrous Metals and Non-ferrous, their physical and Mechanical properties . Pig iron, cast iron, wrought iron, steel properties and uses, hot working and cold working.

Module -3 : Forging and furnaces - (25 marks)

Hand forging operations – (upsetting, bending, setting down, cutting, welding, punching, drawing out, jumping, cutting, Finishing, spreading, tapering), Power forging – (press forging, drop forging), Defects in forging, Forging temperatures for different steel and colour – (MS, SS, HSS), Allowances in forging, Forgeable metals and non-forgeable metals, Hardness measurement – (Rock well, Brinell), Blacksmith forge / hearth, Furnaces – (Bessemer process, open hearth furnace, cupola furnace, blast furnace, induction furnace, electric arc furnace).

Module - 4 : Grain structure, heat treatment - (20 marks)

Time temperature and transformation diagram, cooling curve of pure iron, Microstructure – (ferrite, cementite, pearlite, austenite, sorbite, troostite, bainite, martensite), Heat treatment – (Annealing, Normalizing, Hardening and tempering process for plain carbon steel), Surface hardening process – (case hardening, carburising, nitriding, flame hardening, induction hardening).

Module - 5 : Engineering drawing, Calculation & Science (15 marks)

Different types of orthographic views based on location – (elevation, plan end view), Sectional view importance, Dimensioning methods , Isometric drawing – (construction, importance).

Fraction, Algebra, LCM, HCF , square root, mensuration of solids, Force, Pressure, units, friction, simple machines .

NOTE: - It may be noted that apart from the topics detailed above, questions from other topics prescribed for the educational qualification of the post may also appear in the question paper. There is no undertaking that all the topics above may be covered in the question paper.