FITTER Trade theory Syllabus

1. Soft Skills: its importance and Job area after completion of training. Introduction of First aid. Operation of electrical mains. Introduction of PPEs. Introduction to SS concept & its application. Response to emergencies e.g.; power failure, fire, and system failure.

2. Linear measurements- its units, dividers, calipers, hermaphrodite, centre punch, dot punch, their description uses of different types of hammers. Description, use and care of „V“ Blocks, marking off table.


4. Marking off and layout tools, dividers, scribing block, odd leg calipers, punches- description, classification, material, care & maintenance.

5. Calipers- types, material, constructional details, uses, care & maintenance of cold chisels- materials, types, cutting angles.

6. Marking media, marking blue, Prussian blue, red lead, chalk and their special application, description. Use, care and maintenance of scribing block.

7. Surface plate and auxiliary marking equipment, „V“ block, angle plates, parallel block, description, types and uses, workshop surface plate- their uses, accuracy, care and maintenance. Types of files- convexing taper needle, care and maintenance of files, various types of keys allowable clearances & tapers, types, uses of key pullers.


12. Safety precautions to be observed in a smith shop, forge - necessity, description uses, fuel used for heating, bellows blowers, description and uses.

13. Anvil and swage blocks. Description and uses. Forging tools- hammers- band and sledge, description and uses. Chisels, set hammers, flatters, hardier, fuller swage & uses. Measuring and checking tools- steel rule, brass rule, calipers, try square, description and uses. General idea about the main operations performed in a forging shop such as upsetting drawing, twisting, bending, punching, drilling, and welding.

14. Metallurgical and metal working processes such as Heat treatment, various heat treatment methods - normalizing, annealing, hardening, case hardening and tempering. Power hammer - construction, features, method of operating and uses.

15. Safety precautions to be observed in a sheet metal workshop, sheet and sizes, Commercial sizes and various types of metal sheets, coated sheets and their uses as per BIS specifications. Marking and measuring tools, wing compass, Prick punch, tin man”s square tools, snips, types and uses. Tin man”s hammers and mallets type-sheet metal tools, Soldering iron, types, specifications, uses. Trammel- description, parts, uses. Hand grooves- specifications and uses. Stakes-bench types, parts, their uses. Various types of
metal joints, their selection and application, tolerance for various joints, their selection & application. Wired edges -


18. Drill material, types, (Taper shank, straight shank) parts and sizes. Drill angle—cutting angle for different materials, cutting speed feed. R.P.M. for different materials. Drill holding devices-materials. Drill holding devices-material, construction and their uses. Counter sink, counter bore and spot facing-tools and nomenclature, Reamer—material, types (Hand and machine reamer), kinds, parts and their uses, determining hole size (or reaming), Reaming procedure. Screw threads: terminology, parts, types and their uses. Screw pitch gauge: material parts and uses. Taps British standard (B.S.W., B.S.F., B.A. & B.S.P.) and metric /BIS (coarse and fine) material, parts (shank body, flute, cutting edge). Tap wrench: material, parts, types (solid & adjustable types) and their uses removal of broken tap, studs (tap stud extractor). Dies: British standard, metric and BIS standard, material, parts, types, Method of using dies. Die stock: material, parts and uses.


20. Grinding wheel: Abrasive, grade structures, bond, specification, use, mounting and dressing. Bench grinder parts and use—radius gauge, fillet gauge, material, construction, parts function and metric, different dimensions, convex and concave uses care and maintenance.

21. Radius gauge, feeler gauge, hole gauge, and their uses.

22. Interchangeability: Necessity in Engg, field definition, BIS. Definition, types of limit, terminology of limits and fits—basic size, actual size, deviation, high and low limit, zero line, tolerance zone Different standard systems of fits and limits. British standard system, BIS system Method of expressing tolerance as per BIS Fits: Definition, types description of each with sketch. Vernier height gauge: material construction, parts, graduations (English & Metric) uses, care and maintenance, Pig Iron: manufacturing process by using Blast furnace, types, of pig Iron, properties and uses.


24. Counter sink, counter bore and spot facing-tools and nomenclature, Reamer—material, types (Hand and machine reamer), kinds, parts and their uses, determining hole size (or reaming), Reaming procedure.

25. Simple scraper—cir., flat, half round, triangular and hook scraper and their uses. Blue matching of scraped surfaces (flat and curved bearing surfaces)

27. Dial test indicator, construction, parts, material, graduation, Method of use,. Care and maintenance. Digital dial indicator. Comparators-measurement of quality in the cylinder bores...
29. Assembling techniques such as aligning, bending, fixing, mechanical jointing, threaded jointing, sealing, and torquing. Dowel pins: material, construction, type
30. Safely precautions to be observed while working on a lathe, Lathe specifications, and constructional features. Lathe main parts descriptions- bed, head stock, carriage, tail stock, feeding and thread cutting mechanisms. Holding of job between centers, works with catch plate, dog, simple description of a facing and roughing tool and their applications. Lathe cutting tools: Brief study of the nomenclature of Lathe cutting tools and necessity of correct grinding, solid and tipped, throw away type tools, cutting speed and feed and comparison for H.S.S., carbide tools. Use of coolants and lubricants. Chucks and chucking the independent four- jaw chuck. Reversible features of jaws, the back plate, Method of clearing the thread of the chuck-mounting and dismounting, chucks, chucking true, face plate, drilling - method of holding drills in the tail stock, Boring tools and enlargement of holes. General turning operations- parallel or straight, turning. Stepped turning, grooving, and shape of tools for the above operations. Appropriate method of holding the tool on tool post or tool rest, Knurling: - tools description, grade, uses, speed and feed, coolant for knurling, speed, feed calculation. Taper - definition, use and method of expressing tapers. Standard tapers-taper, calculations morse taper.
31. Screw thread definition - uses and application. Terminology of screw threads, square, worm, buttress, acme (non standard- screw threads),Principle of cutting screw thread in centre lathe - principle of chasing the screw thread - use of centre gauge, setting tool for cutting internal and external threads, use of screw pitch gauge for checking the screw thread. Screws: material, different types (inch & metric), uses Testing scraped surfaces: ordinary surfaces without a master plate.
32. Special files: types (pillar, Dread naught, Barrow, warding) description.
35. Locking device: Nuts- types (lock nut castle nut, slotted nuts, swam nut, grooved nut) Description and use.
37. Manufacture: The name and types of gauge commonly used in gauging finished product- Method of selective assembly „Go“ system of gauges, hole plug basis of standardization.
38. Bearing-Introduction, classification (Journal and Thrust), Description of each, ball bearing: Single row, double row, description of each, and advantages of double row. Roller and needle bearings: Types of roller bearing. Description & use of each Industrial visit. Synthetic materials for bearing: The plastic laminate materials, their properties and uses in bearings such as phenolic, teflon polyamide (nylon). Method of fitting ball and roller bearings. Bearing metals -types, composition
and uses, lubricants purpose of using different types, description and uses of each type.


40. Drilling jig-constructional features, types and uses. Fixtures-Constructional features, types and uses.

41. Pipes and pipefitting- commonly used pipes. Pipe schedule and standard sizes. Pipe bending methods. Use of bending fixture, pipe threads-Std. Pipe threads Die and Tap, pipe vices. Standard pipefitting-. Methods of fitting or replacing the above fitting, repairs and erection on rainwater drainage pipes and house hold taps and pipe work. Use of tools such as pipe cutters, pipe wrenches, pipe dies, and tap, pipe bending machine etc.

42. Fire precautions-causes and types of fires, precautions against out break of fire. Fire Extinguishers-types and use.

43. Working material with finished surface as aluminium, duralumin, stainless steel, the importance of keeping the work free from rust and corrosion. The various coatings used to protect metals, protection coat by heat and electrical deposit treatments. Treatments and provide a pleasing finish as chromium silver plating and nickel plating, and galvanising. Aluminium and its alloys. Uses, advantages and disadvantages, weight and strength as compared with steel.

44. Tapers on keys and cotters permissible by various standards. Discuss non-ferrous metals as brass, phosphor bronze, gunmetal, copper, aluminium etc. Their composition and purposes where and why used, advantages for specific purposes, surface wearing properties of bronze and brass.

45. Power transmission elements. The object of belts, their sizes and specifications, materials of which the belts are made, selection of the type of belts with the consideration of weather, load and tension methods of joining leather belts. Vee belts and their advantages and disadvantages, Use of commercial belts, dressing and resin creep and slipping, calculation. Power transmissions, coupling types-flange coupling, - Hooks coupling-universal coupling and their different uses. Pulleys-types-solids, split and „V“ belt pulleys, standard calculation for determining size crowning of faces- loose and fast pulleys-jockey pulley. Types of drives- open and cross belt drives. The geometrical explanation of the belt drivers at an angle. Power transmission -by gears, most common form spur gear, set names of some essential parts of the set- The pitch circles, Diametral pitch, velocity ratio of a gear set, Helical gear, herring bone gears, bevel gearing, spiral bevel gearing, hypoid gearing, pinion and rack, worm gearing, velocity ration of worm gearing. Repair to gear teeth by building up and dovetail method.


47. Importance of Technical English terms used in industry -(in simple definition only) Technical forms, process charts, activity logs, in required formats of industry, estimation, cycle time, productivity reports, job cards.

48. Installation, maintenance and overhaul of machinery and engineering equipment and Hydraulics & pneumatic symbols & exercise. Hydraulics pneumatic circuits. Clutch: Type, positive clutch (straight tooth type, angular tooth type).

49. Washers-Types and calculation of washer sizes. The making of joints and fitting packing. The use of
lifting appliances, extractor presses and their use. Practical method of obtaining mechanical advantage. The slings and handling of heavy machinery, special precautions in the removal and replacement of heavy parts.

51. **Foundation bolt**: types (rag, Lewis cotter bolt) description of each erection tools, pulley block, crow bar, spirit level, Plumb bob, pipe 2 X 4", wire rope, manila rope, wooden block.
1. **ಮೂಲ ತಿಳಿಯುವ ಪ್ರಕಟವೆಂದು** - ಹಾಗೆ ಅನುಪ್ರಯೋಗಿಸಿದ ವಸ್ತುಗಳಿಂದ ಅದರ ಉಪಯೋಗವಾಗಿ. ಸೂತ್ರದಲ್ಲಿ ಸೂತ್ರದಲ್ಲಿ, ಮಾತೃಶಾಸನದಲ್ಲಿ, PPE ಮಾತೃಶಾಸನದಲ್ಲಿ, 5S ಮಾತೃಶಾಸನದಲ್ಲಿ, ಸೂತ್ರದಲ್ಲಿ, ಸೂತ್ರದಲ್ಲಿ, ಸೂತ್ರದಲ್ಲಿ, ಮಾತೃಶಾಸನದಲ್ಲಿ.
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37. _GAUï - GAUï AEEAQWA, GAUï AWÅÅ, GAUï AVÀÄ, GAUï - GAUï 37. GAUï EAA-
38. _GAUï - GAUï AE AQWA, GAUï AVÀÄ, GAUï EAA-
39. _GAUï - GAUï AE AQWA, GAUï AVÀÄ, GAUï EAA-
40. _GAUï - GAUï AE AQWA, GAUï AVÀÄ, GAUï EAA-
41. _GAUï - GAUï AE AQWA, GAUï AVÀÄ, GAUï EAA-
42. _GAUï - GAUï AE AQWA, GAUï AVÀÄ, GAUï EAA-
43. _GAUï - GAUï AE AQWA, GAUï AVÀÄ, GAUï EAA-
44. _GAUï - GAUï AE AQWA, GAUï AVÀÄ, GAUï EAA-
45. _GAUï - GAUï AE AQWA, GAUï AVÀÄ, GAUï EAA-