Metal Forming – Final exam topics - 2023

1. Draw sketches on the extrusion methods and name the main elements.
2. Calculate the force needed to extrude forward a cylinder with the given data.
3. Calculate the force needed to extrude backwards a cup with the given data.
4. List the possible extrusion defects and give a solution for avoiding them.
5. Combined extrusion process.
6. Principle and design of retained dies.
7. Reduction, requirement of execution.
8. Wire and rod drawing, effect of the drawing angle.
9. Principle and characteristics of open die forging.
10. Principle and characteristics of closed die forging.
11. Technology steps of closed die forging.
12. Role of flash, typical die geometries for the flash.
13. Rotary swaging.
14. Electrical upsetting.
15. Principle of deep drawing, and multi-step deep drawing.
16. Calculate the number of deep drawing steps and necessary annealing.
17. Defects during deep drawing and solutions.
18. Process of bending.
19. Relationship of bending and rolling direction.
20. Cold bending of smaller pipes.
21. Warm bending of big-size pipes.
22. Technique and tooling of shearing.
23. Punching and blanking.
24. Technique and tooling of fine blanking.
25. Work (energy) controlled forming machines, main characteristics.
26. Stroke (ram path) controlled forming machines, main characteristics.
27. Force controlled forming machines, main characteristics.