



**DIPLOMA IN Mechanical Engineering
(Tool & Die)**

CENTRALIZED QUESTION BANK

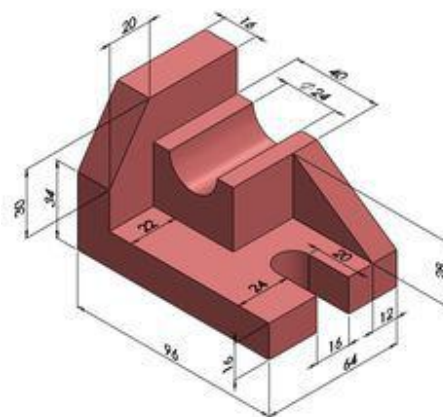
4020640 - Solid Modeling Practical

**DIRECTORATE OF TECHNICAL
EDUCATION GOVERNMENT OF
TAMILNADU**

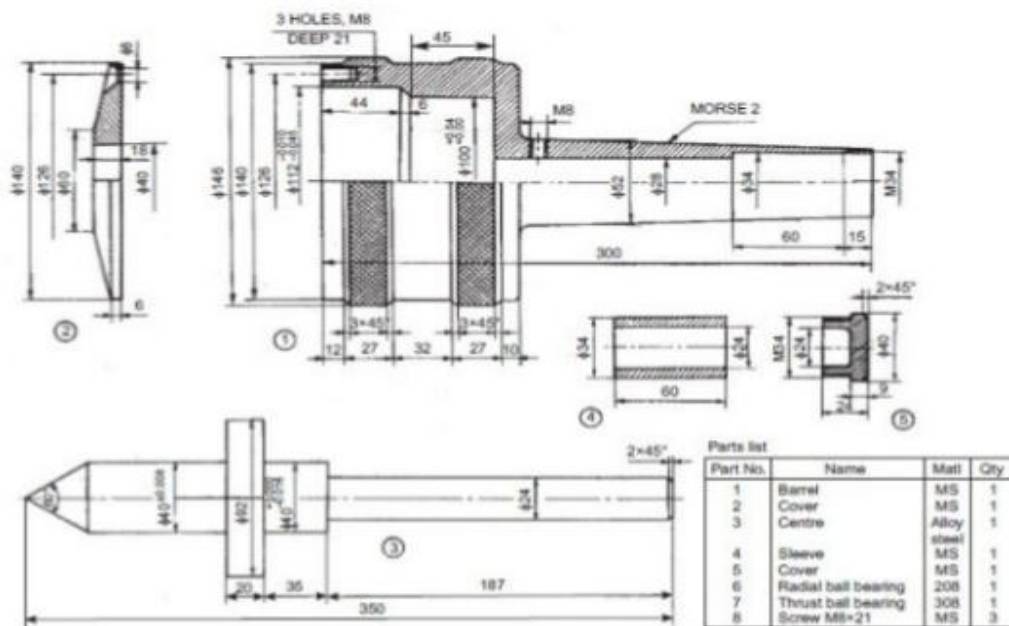
Max Marks: 100

Answer the Following Question

1. (a) Draw the given 3D drawing using 3D modelling commands.



(b) Draw the part models and assemble the components using 3D modelling.



- [illegible]

The technical drawing illustrates the design of a lathe tool post assembly, consisting of the following components and their dimensions:

- Body-CS:** The main body of the tool post. Dimensions include a total length of 280, a central hole of $\phi 8$ (4 tapped 15 long on 56 PCD), and a base diameter of $\phi 64$. It features a $12R$ fillet and a $R24$ transition.
- Barrel-Alloy steel:** A tapered component with a length of 175. It has a central hole of $\phi 22$ and SQ threads LH $\phi 20$ pitch 5. A feather way of 5×3 is indicated.
- Spindle-Alloy steel:** A long component with a total length of 215. It features SQ threads LH $\phi 20$ pitch 5 and a feather key way of 5×5 . The end section includes a $\phi 16$ M12 thread and a $\phi 32$ hole.
- Centre-Alloy steel:** A conical component with a length of 50 and a base diameter of $\phi 6$. It has a 160° included angle and a $\phi 22$ hole.
- Nut and Bolt MS:** A standard nut and bolt assembly with a length of 75. The nut has a diameter of $\phi 38$ and the bolt has a diameter of $\phi 8$.

The drawing also includes a cross-sectional view of the tool post assembly, showing the internal structure and the $28R$ fillet at the base.

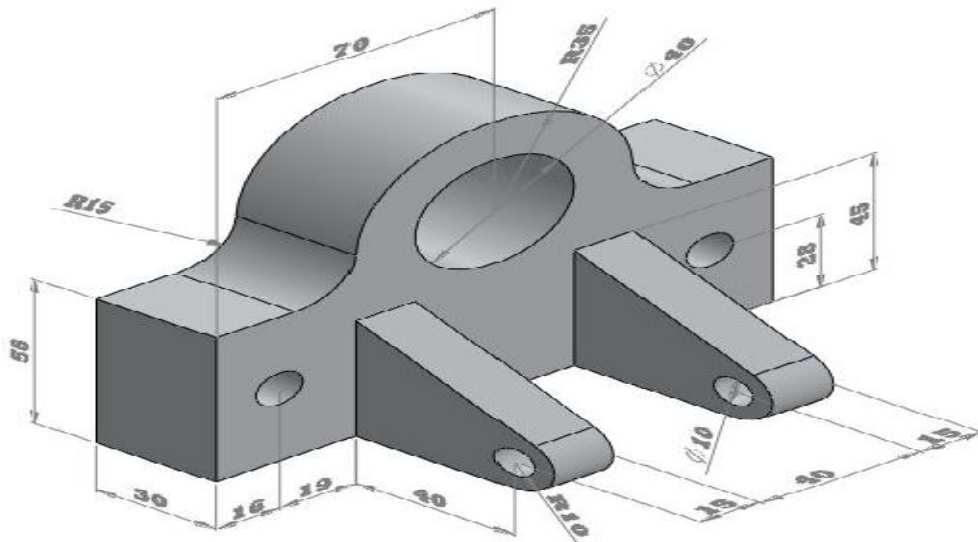
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- Isometric view of a mechanical part with dimensions: 44, 36, 12, 82, 106, 12, 12, 10, R12, R10, R14, R22.

The drawing illustrates the design of a Machine Vice, including the following components and views:

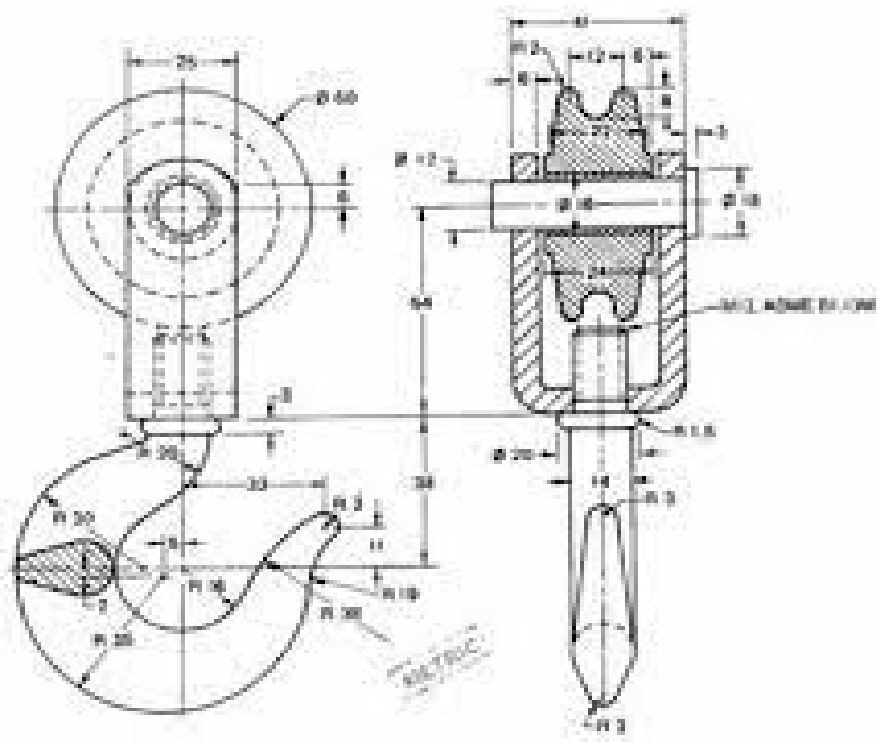
- Section A-A:** A cross-sectional view of the fixed jaw, showing a width of 90 and a height of 26.
- SCREW SPINDLE:** A central component with a square thread, labeled "M12 x 2 Square Thread SCREW SPINDLE M.S.-1 OFF".
- BASE C.S. 1 OFF:** A base component with a width of 32 and a height of 32, featuring a 3x45° chamfer and 2xφ8 holes.
- BLOCK C.S. -1 OFF:** A block component with a width of 32 and a height of 32, featuring a 3x45° chamfer and 2xφ8 holes.
- CSK HEAD SCREW M.S.-4 OFF:** A component with a 45° chamfer and a width of 32.
- FIXED JAW C.S. - 1 OFF:** A component with a 3x45° chamfer and a width of 32.
- 2 x M8 Deep 15:** A component with a width of 32 and a height of 32, featuring 2x M8 holes.
- SLIDING JAW - C.S. 1 OFF:** A component with a width of 32 and a height of 32, featuring a 3x45° chamfer and 2xφ8 holes.
- END PLATE M.S.-1 OFF:** A component with a width of 32 and a height of 32, featuring a 3x45° chamfer and 2xφ8 holes.
- CSK HEAD SCREW M.S.-2 OFF:** A component with a 45° chamfer and a width of 32.
- Sectional Front view:** A view showing the internal components of the fixed jaw, including the screw spindle and the base.
- Left side view:** A view showing the side profile of the fixed jaw, including the base and the sliding jaw.
- Top view:** A view showing the top profile of the fixed jaw, including the base and the sliding jaw.

The overall dimensions of the Machine Vice are 183 (width) x 190 (depth) x 90 (height).

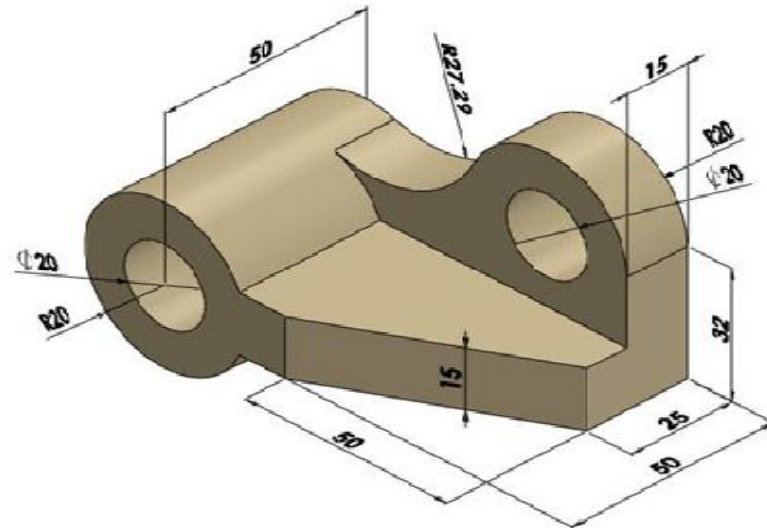
4. (a) Draw the given 3D drawing using 3D modelling commands.



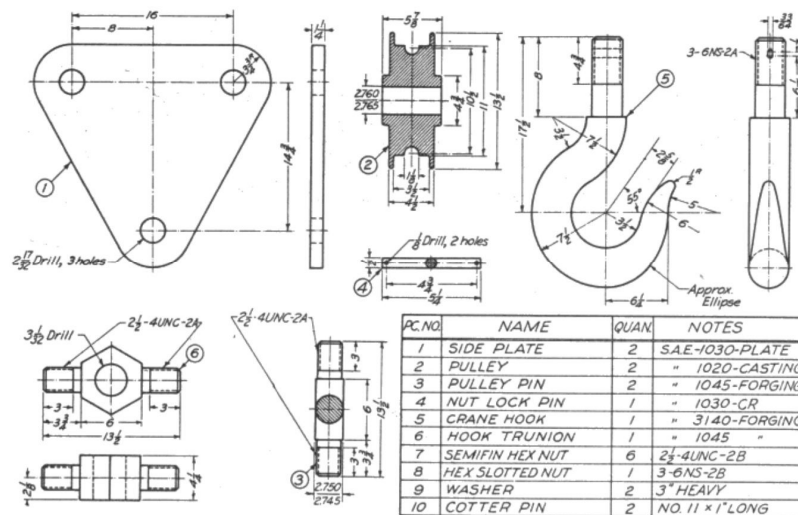
- (b) Draw the part models and assemble the components using 3D modelling.



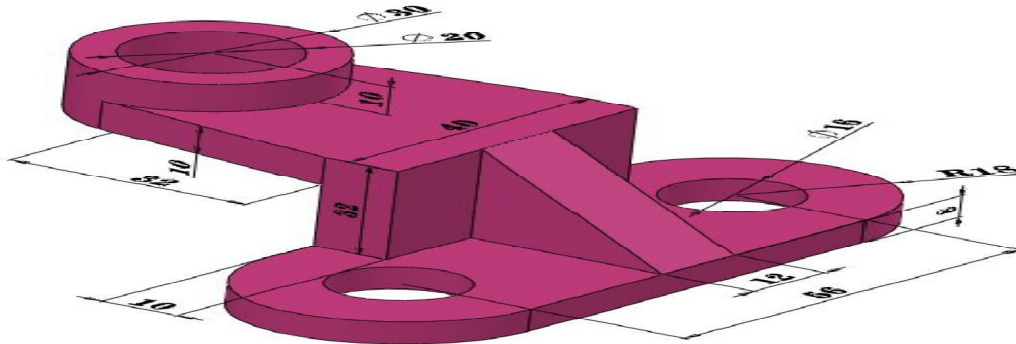
5. (a) Draw the given 3D drawing using 3D modelling commands.



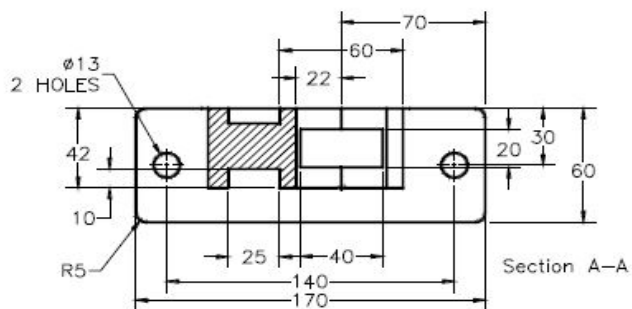
- (b) Draw the part models and assemble the components using 3D modelling.



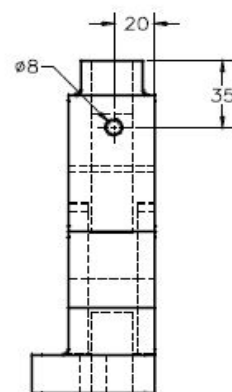
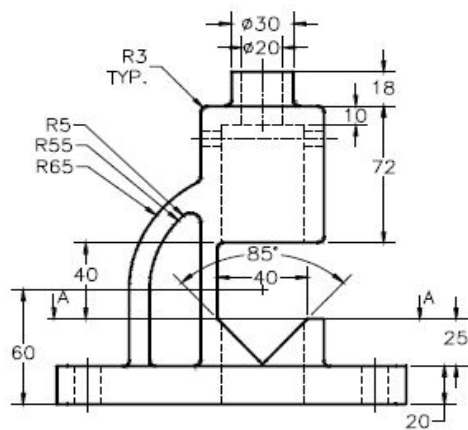
6. (a) Draw the given 3D drawing using 3D modelling commands.



- (b) Draw the part models and assemble the components using 3D modelling.



Fillet radius= 3mm,
unless specified



DETAILED ALLOCATION OF MARKS

Sl. No. Performance Indicator Marks

Part A – 3D Component Modelling

1 Sketching	-15
2 3D Modelling	-15

Part B – Assemble Drawing Modelling

3 Sketching / Part modelling	-20
4 Assembly	-30
5 Solid Model / Views	-10
6 Viva voce	-10
Total	100