**Sample Question Bank**

**Program: Mechanical Engineering**

**Curriculum Scheme: Rev2019**

**Third Year, Semester VI**

**Course Code: MEDLO-6023 and Course Name: Metal Forming Technology**

**Multiple Choice Questions : Sample Question Set**

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|  | **Choose the correct option for following questions. All the Questions carry equal marks** |
| 1. | Roll forging..... |
| Option A: | Causes a steadily applied pressure instead of impact force |
| Option B: | Is used to force the end of a heated bar into a desired shape |
| Option C: | Is a forging operation in which two halves of rotating die open and close rapidly while impacting the end of the heated tube or shell |
| Option D: | Is a forging method for reducing the diameter of a bar and in the process making it longer |
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| 2. | Upset forging.... |
| Option A: | Causes a steadily applied pressure instead of impact force |
| Option B: | Is used to force the end of a heated bar into a desired shape |
| Option C: | Is a forging operation in which two halves of rotating die open and close rapidly while impacting the end of the heated tube or shell |
| Option D: | Is a forging method for reducing the diameter of a bar and in the process making it longer |
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| 3. | Forging of a plain carbon steel is carried out... |
| Option A: | 750oC |
| Option B: | 900oC |
| Option C: | 1100oC |
| Option D: | 1300oC |
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| 4. | The operation of removing the burr or flash from the forged parts in drop forging is known as... |
| Option A: | Lancing |
| Option B: | Trimming |
| Option C: | Coining |
| Option D: | Shot peening |
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| 5. | Hot press forging... |
| Option A: | Causes a steadily applied pressure instead of impact force |
| Option B: | Is used to force the end of a heated bar into a desired shape |
| Option C: | Is a forging operation in which two halves of rotating die open and close rapidly while impacting the end of the heated tube or shell |
| Option D: | Is a forging method for reducing the diameter of a bar and in the process making it longer |
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| 6. | Zipper as a surface defect occurs in |
| Option A: | Casting process |
| Option B: | Welding process |
| Option C: | Machining process |
| Option D: | Rolling process |
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| 7. | In a rolling process, the state of stress of the material undergoing deformation is |
| Option A: | Pure compression |
| Option B: | Pure Shear |
| Option C: | Compression and Shear |
| Option D: | Tension and Shear |
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| 8. | A rolling mill is used to reduce the thickness of plate from 50 mm to 25 mm. The roll diameter is 700 mm and the coefficient of friction at the roll interface is 0.1. It is required that the draft in each pass must be the same. Assuming no front and back tensions, the minimum number of passes required in rolling are: |
| Option A: | 16 |
| Option B: | 8 |
| Option C: | 4 |
| Option D: | 12 |
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| 9. | A strip of thickness 40 mm is to be rolled to thickness of 20 mm using a two-high mill having rolls of diameter 200mm. Coefficient of friction and arc length in mm, respectively are |
| Option A: | 0.45 and 38.84 |
| Option B: | 0.39 and 38.84 |
| Option C: | 0.39 and 44.72 |
| Option D: | 0.45 and 44.72 |
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| 10. | Two working rolls of small diameter and four or more back up rolls of large diameter are |
| Option A: | three-high rolling mill |
| Option B: | two-high rolling mill |
| Option C: | four-high rolling mill |
| Option D: | cluster mill |
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| **11.** | In \_\_\_\_\_\_\_\_\_\_ extrusion process the direction of flow of metal is in same direction as that of ram. |
| Option A: | direct |
| Option B: | Indirect |
| Option C: | impact |
| Option D: | hydrostatic |
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| **12.** | In \_\_\_\_\_\_\_\_\_\_ metal process frictional loss is eliminated at the billet interface. |
| Option A: | direct |
| Option B: | Indirect |
| Option C: | impact |
| Option D: | hydrostatic |
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| **13.** | In forward extrusion , the problem of friction is severe in case of \_\_\_\_\_\_\_ |
| Option A: | lead |
| Option B: | aluminum |
| Option C: | Tin |
| Option D: | steel |
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| **14.** | Degree of drawing is measured in terms of ­­­­\_\_\_\_\_\_\_\_\_ |
| Option A: | reduction in stress |
| Option B: | reduction in force |
| Option C: | reduction in area |
| Option D: | reduction in strain |
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| **15.** | \_\_\_\_\_\_\_\_\_\_\_ forming processes is suitable for making utensils and cup shaped objects |
| Option A: | forging |
| Option B: | rolling |
| Option C: | Deep drawing |
| Option D: | Wire drawing |
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| **16.** | Spring back phenomenon occurs in \_\_\_\_\_\_\_\_ |
| Option A: | forging |
| Option B: | Hot penning |
| Option C: | spinning |
| Option D: | bending |
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| **17.** | \_\_\_\_\_\_ is a process of making sheet metal components to the contour of a die by making use of an explosive impact. |
| Option A: | Explosive cladding |
| Option B: | Explosive welding |
| Option C: | Explosive forming |
| Option D: | Explosive joining |
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| **18.** | \_\_\_\_\_\_\_\_\_\_\_ is the most important parameter in hydroforming |
| Option A: | pressure |
| Option B: | Surface tension |
| Option C: | viscosity |
| Option D: | Flow velocity |
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| **19.** | The mode of deformation of the metal during spinning is \_\_\_\_\_\_\_\_\_\_ |
| Option A: | bending |
| Option B: | stretching |
| Option C: | rolling and stretching |
| Option D: | bending and stretching |
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| **20.** | \_\_\_\_\_\_\_\_ is best metal forming process suited for making products like aircraft wings and window frames. |
| Option A: | forging |
| Option B: | rolling |
| Option C: | bending |
| Option D: | Stretch forming |
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| **21** | The spring back effect in press working is \_\_\_\_\_\_\_\_ |
| Option A: | Elastic recovery of the sheet metal after removal of the load |
| Option B: | Regaining the original shape of the sheet metal |
| Option C: | Release of stored energy in the sheet metal |
| Option D: | Partial recovery of the sheet metal |
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| **22** | Magnetic forming is an example of \_\_\_\_\_\_\_ |
| Option A: | Cold forming |
| Option B: | Hot forming |
| Option C: | High energy forming |
| Option D: | Roll forming |
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| **23** | \_\_\_\_\_\_\_ is not a high energy rate forming process. |
| Option A: | Electro-magnetic forming |
| Option B: | Roll- forming |
| Option C: | Explosive forming |
| Option D: | Electrohydraulic forming |
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| **24** | The extrusion pressure depends up on \_\_\_\_\_\_\_\_\_\_\_ |
| Option A: | Extrusion Temperature |
| Option B: | The reduction in area |
| Option C: | The extrusion speed |
| Option D: | All of the above |
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| **25.** | A moving mandrel is used in \_\_\_\_\_\_ |
| Option A: | Wire drawing |
| Option B: | Tube drawing |
| Option C: | Metal cutting |
| Option D: | Forging |
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| **26.** | What is the major problem in extrusion? |
| Option A: | Design of Punch |
| Option B: | Design of die |
| Option C: | Wear and tear of die |
| Option D: | Wear of punch |
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| **27.** | The extrusion process used in manufacturing short length components like tooth paste tubes, gun shells etc. is: |
| Option A: | Indirect extrusion |
| Option B: | Direct extrusion |
| Option C: | Hydrostatic extrusion |
| Option D: | Continuous extrusion |
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| **28.** | Which of the following process would produce strongest components? |
| Option A: | Hot Rolling |
| Option B: | Extrusion |
| Option C: | Cold Rolling |
| Option D: | Forging |
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| **29.** | Which of the following is an advantage of forging? |
| Option A: | Good surface finish |
| Option B: | Low tooling cost |
| Option C: | Close tolerance |
| Option D: | Improved physical property |
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| **30.** | For successful extrusion, the metal should be |
| Option A: | Ductile |
| Option B: | Malleable |
| Option C: | Plastic |
| Option D: | Tough |

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| **Descriptive Questions Sample set**   1. Explain with neat figure different extrusion equipment used for Extrusion process. |
| 1. Explain roll bending and curling operation with its applications. |
| 1. Determine the drawing stress to produce 20 % reduction in a 10 mm stainless steel wire. The flow stress is given by σ= 1300 MPa. The die angle is 12degree and µ = 0.09. If the wire is nearing through the die at 3 m/s. Determine the power required to produce the deformation. |
| 1. Differentiate between direct and indirect extrusion process. |
| 1. A 75 mm long billet whose diameter = 30 mm is reduced by indirect extrusion to a dimeter = 10 mm (circular die). Die angle = 90 degree. In the Johnson equation a= 0.8, and b =1.5. In the flow curve for the work metal K= 500 N/mm2 and n= 0.25. Determine ( a) extrusion ratio (b) true strain (c) extrusion strain and ram force if the ram speed = 500 mm/min. |
| 1. A spool of wire has a starting diameter of 2.5 mm. It is drawn through a die with an opening that is to 2.1 mm. The entrance angle of the die is 18 degrees. Coefficient of friction at work die interface is 0.08. The work metal has a strength coefficient of 450 MPa. And strain hardening coefficient of 0.26. The drawing is performed at room temperature. Determine area reduction and draw stress. |
| 1. Classify different defects in extruded products. |
| 1. Explain with neat figure the equipment’s used and different process parameters associated with spinning and stretch forming operations. |
| 1. Explain with neat figure the equipment’s used and different process parameters associated with edge and V bending operations. |
| 1. Explain with neat figure the equipment’s used and different process parameters associated with explosive and hydro forming operations. |
| 1. How is the Stress-Strain diagram useful in understanding the mechanical behavior of a metal? |
| 1. Draw Schematic and explain the different types of roller arrangements. |
| 1. Classify the different types of metal forming processes and explain in brief any one of them. |
| 1. A tensile specimen with a 12 mm initial diameter and 50 mm guage length reaches a maximum load of 90 kN and fractures at 70kN.The minimum diameter at fracture is 10 mm. Determine the engineering stress at maximum load, the true fracture stress and the true strain at fracture. |
| 1. A 300 mm wide strip, 25 mm thick is fed through a rolling mill with two powered rolls each of radius 250 mm. The workpiece thickness is reduced to 22 mm in one pass at a roll speed of 50 rev/min. The work piece material has a flow curve defined by K = 275 MPa and n=0.15, and the co-efficient of friction is 0.12.Determine the roll force and power. |

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| 1. Illustrate with neat diagram, stationery Plug drawing metal forming process with its applications. |
| 1. Illustrate with neat diagram, moving mandrel type drawing metal forming process with its applications. |
| 1. Illustrate with neat diagram, V and edge bending sheet metal operations. |
| 1. Define the term flow stress w.r.t. metal forming process. |
| 1. Explain with a neat figure explosive forming process with its advantages. |
| 1. Explain how seamless pipes are manufactured by extrusion process. |
| 1. a wire is drawn through a die with entrance angle = 15. Starting diameter is 2.5 mm and final diameter = 2 mm. The coefficient f friction at work die interface is 0.07. The metal has a strength coefficient K = 205 MPa. And strain hardening exponent n= 0.2. Determine the draw stress and draw force in this operation. |
| 1. Explain with a neat figure deep drawing operation. |
| 1. Explain with a neat figure magnetic pulse operation. |
| 1. Explain the advantages of High Velocity forming of metals. |
| 1. Explain the different types of Rolling |
| 1. Give a broad classification of manufacturing processes |
| 1. What are the different metal forming processes? Draw schematic and explain |
| 1. Differentiate between hot / cold working |
| 1. How is true stress different from engineering stress? |
| 1. In Metal forming how is strain rate defined?Write the expression for strain rate. |
| 1. Draw a neat diagram, and explain upset forging. |
| 1. Explain any three rolling defects |
| 1. Discuss the role of hammers / presses in Forging operation. |
| 1. Find the magnitude of true strain for a bar which is compressed to half its original length. |