**SAMPLE QUESTION BANK**

**Program: BE (Mechanical Engineering)**

Curriculum Scheme: **Rev2019 C Scheme**

**TE MECHANICAL: DLOC-II- MEDLO6022: TOOL ENGINEERING**

**MCQ- SAMPLE SET**

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| 1. | In …..cutting operation, the cutting edge is normal to axis of workpiece |
| Option A: | Oblique |
| Option B: | Orthogonal |
| Option C: | Inclined |
| Option D: | clearance |
|  |  |
| 2. | Radial force is involved in…..cutting operation |
| Option A: | Oblique |
| Option B: | Orthogonal |
| Option C: | Inclined |
| Option D: | rake |
|  |  |
| 3. | Brittle materials form ………type of chips |
| Option A: | Continuous |
| Option B: | Discontinuous |
| Option C: | Continuous chip with BUE |
| Option D: | Discontinuous chip with BUE |
|  |  |
| 4. | High heat generation results in …...type of chips |
| Option A: | Continuous |
| Option B: | Discontinuous |
| Option C: | Continuous chip with BUE |
| Option D: | Discontinuous chip with BUE |
|  |  |
| 5. | In an experiment on orthogonal cutting, a chip length of 85 mm was obtained from an uncut chip length of 202 mm while cutting with a tool of 20⁰ rake angle using a depth of cut of 0.5 mm. Chip thickness ration is 0.42. Determine shear angle. |
| Option A: | 29.4 |
| Option B: | 27.4 |
| Option C: | 24.7 |
| Option D: | 42.7 |
|  |  |
| 6. | Cutting fluids should possess ……………flash point |
| Option A: | High |
| Option B: | Medium |
| Option C: | Low |
| Option D: | Low to medium |
|  |  |
| 7. | Gas used commonly during cryogenic cooling of metal cutting is …….. |
| Option A: | nitrogen |
| Option B: | hydrogen |
| Option C: | oxygen |
| Option D: | helium |
|  |  |
| 8. | Maximum heat is carried away by ……in metal cutting operation |
| Option A: | Chips |
| Option B: | Cutting tool |
| Option C: | Workpiece |
| Option D: | Machine |
|  |  |
| 9. | Cutting fluid is applied in the form of droplets in………process |
| Option A: | Flood method |
| Option B: | High-jet |
| Option C: | Mist application |
| Option D: | Water-jet |
|  |  |
| 10. | Defoamers used in cutting fluids is to take care of ……… |
| Option A: | Pollution |
| Option B: | Bacteria and fungus |
| Option C: | Sediments |
| Option D: | Change in water quality |
|  |  |
| 11. | ………..tool material indicates high hardness at high temperatures. |
| Option A: | Cemented carbides |
| Option B: | High speed steel |
| Option C: | Cobalt alloys |
| Option D: | Ceramics |
|  |  |
| 12. | Cutting tool material should possess……….thermal conductivity |
| Option A: | Low |
| Option B: | Medium |
| Option C: | High |
| Option D: | variable |
|  |  |
| 13. | ……..material looses hardness at high temperatures |
| Option A: | Cemented carbide |
| Option B: | Ceramics |
| Option C: | Cermets |
| Option D: | Carbon tool steels |
|  |  |
| 14. | ……..alloying element has highest percentage in high speed steels |
| Option A: | Cr |
| Option B: | W |
| Option C: | Mo |
| Option D: | V |
|  |  |
| 15. | ………. Cutting tool material is hardest after diamond. |
| Option A: | Ceramics |
| Option B: | Cubic boron nitride |
| Option C: | High speed steels |
| Option D: | Cemented carbides |
|  |  |
| 16. | Cyclic stresses on the material causes…………wear |
| Option A: | adhesion |
| Option B: | abrasion |
| Option C: | diffusion |
| Option D: | fatigue |
|  |  |
| 17. | Rubbing of cutting tool with machined surface gives rise to ……….wear |
| Option A: | Flank |
| Option B: | Crater |
| Option C: | Diffusion |
| Option D: | cohesion |
|  |  |
| 18. | Steady-state wear region indicates …………..wear rate |
| Option A: | Increased |
| Option B: | Constant |
| Option C: | decreased |
| Option D: | rapid |
|  |  |
| 19. | Pit formation on the surface gives rise to ………wear. |
| Option A: | flank |
| Option B: | crater |
| Option C: | abrasion |
| Option D: | cohesion |
|  |  |
| 20. | With an increase in cutting speed, tool life …………….. |
| Option A: | Increases |
| Option B: | Decreases |
| Option C: | remains same |
| Option D: | may increase or decrease |
|  |  |
| 21. | In ORS for cutting tools, the orthogonal plane is ………….to cutting plane |
| Option A: | Normal |
| Option B: | Parallel |
| Option C: | Intersecting |
| Option D: | oblique |
|  |  |
| 22. | ………angle decreases the friction between principal flank surface and workpiece during metal cutting operation. |
| Option A: | Clearance |
| Option B: | Rake |
| Option C: | Helix |
| Option D: | Bevel |
|  |  |
| 23. | ….angle influences the direction of chip flow |
| Option A: | Rake |
| Option B: | Inclination |
| Option C: | Relief |
| Option D: | cutting edge |
|  |  |
| 24. | Hard materials can be easily machined by…………… |
| Option A: | lathe machining |
| Option B: | EDM |
| Option C: | Milling |
| Option D: | CNC |
|  |  |
| 25. | …..angle reduces power consumption in metal cutting operation |
| Option A: | Inclination |
| Option B: | Cutting edge |
| Option C: | Clearance |
| Option D: | Rake |
|  |  |
| 26. | ………… are intended for producing the desired contour on a work piece by means of a turning operation. |
| Option A: | form tools |
| Option B: | lathe tools |
| Option C: | drill |
| Option D: | shapers |
|  |  |
| 27. | In milling operation, ……………..angle avoids rubbing of teeth with machined surface |
| Option A: | Clearance |
| Option B: | Rake |
| Option C: | Inclination |
| Option D: | bevel |
|  |  |
| 28. | Face milling includes axis of cutter ………to work surface. |
| Option A: | Normal |
| Option B: | Parallel |
| Option C: | Inclined |
| Option D: | oblique |
|  |  |
| 29. | Height of teeth in broach is ……… |
| Option A: | Increasing |
| Option B: | Decreasing |
| Option C: | Same height |
| Option D: | No teeth present |
|  |  |
| 30. | Rake angle of reaming tool is kept low for ……..materials |
| Option A: | Al |
| Option B: | Grey CI |
| Option C: | Brass |
| Option D: | Steels |
|  |  |

**Descriptive Questions- SAMPLE SET**

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| Q1. | Differentiate between Orthogonal cutting and Oblique cutting processes. |
| Q2. | Calculate the power consumed in the metal cutting operation of a low carbon steel bar 40 mm diameter if the cutting force is 150 kg, at 200 RPM. |
| Q3. | In orthogonal cutting of a material the feed force is 80 kg and cutting force is 150 kg. Calculate the following:  Compression and shear forces on shear plane  Coefficient of friction of the chip on the tool face  Take chip thickness ratio as 0.3 and rake angle as 8⁰ |
| Q4. | Explain the sources of heat generation in metal cutting operation with a neat sketch. |
| Q5. | Write a short note on Cryogenic cooling |
| Q6. | Write a short note on maintenance of cutting fluids. |
| Q7. | Enlist the desirable properties of a cutting tool material. |
| Q8. | Which characteristics are required in the cutting tools? |
| Q9. | Comment about the following properties in relation to tool steels: a) Hardness b) Toughness c) Strength d) Red hardness e) High temperature stability |
| Q10. | Enlist the causes of tool wear in metal cutting operation. |
| Q11. | Write a short note on Abrasive wear of cutting tools |
| Q12. | Write Taylor’s tool life equation and explain the different terms associated with it. |
| Q13. | Explain the design procedure for a single point cutting tool shank. |
| Q14. | Explain the clearance angle and rake angle in detail. |
| Q15. | What are the functions of a chip braker in metal cutting operation? |
| Q16. | Write different terms associated with the broach. |
| Q17. | Explain the design procedure for the broach tool |
| Q18. | The feed of 8 tooth face milling cutter is 0.032 cm per tooth at 200 rpm. The material cut is 200BHN steel (K=0.8). The depth of cut is 0.32cm and width is 10 cm. Calculate the horsepower at cutter and horsepower at motor if the efficiency of machine is 60%. |
| Q19. | Derive the expressions for shear plane forces and tool /friction plane forces on cutting tool. |
| Q20. | In an orthogonal turning operation,  Cutting speed = 80 m/min  Cutting force = 20 kg  Feed Force = 8 kg  Back Rake angle = 15⁰  Feed = 0.2 mm/rev.  Chip thickness = 0.4 mm  Determine a) Shear angle b) Work done in shear c) Shear strain |
| Q21. | A pipe 30 mm in diameter is being used on a lathe with a tool having rake angle of 10⁰ and a feed of 0.2 mm/rev. The length of chip over one revolution of workpieces is 72mm. The cutting speed is 60 mpm. The tangential force is 1kN and feed force is 0.65kN. chip thickness 0.6mm. Calculate: a) Resultant force b) Shear angle c) Shear force d) normal compressive force e) frictional force f) normal force g) cutting power |
| Q22. | Enlist the requirements of a good cutting fluid. |
| Q23. | What are the effects of Built-up Formation on the metal cutting operation? |
| Q24. | How to increase the wear resistance of the cutting tools. |
| Q25. | Define various angles involved in the orthogonal rake system of tool nomenclature. |
| Q26. | What are the functions of a chip braker in metal cutting operation? |
| Q27. | Explain the design procedure for the milling cutter. |