**18ME504**

**Hall Ticket Number:**

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| **III/IV B.Tech (Regular) DEGREE EXAMINATION** | | | |
| **February, 2021** | **Mechanical Engineering** | | |
| **Fifth Semester** | **Metal Cutting & Machine Tools** | | |
| **Time:** Three Hours | | **Maximum:50marks** | |
| *Answer ALL Questions from PART-A.* | | | (1X10 = 10 Marks) |
| *Answer* ***ANY FOUR*** *questions from PART-B.* | | | (4X10=40 Marks) |
| **Part - A** | | | |

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| **1** | **Answer all questions** | | **(10X1=10Marks)** | |
|  | a) | What are the primary and auxiliary motions for turning operation in lathe. | |  |
|  | b) | Mention the taper turning Methods in lathe. | |  |
|  | c) | What is the purpose of using back gears in the lathe. | |  |
|  | d) | How is the size of planer specified? | |  |
|  | e) | How the machining time in drilling is calculated. | |  |
|  | f) | Differentiate between up milling and down milling. | |  |
|  | g) | What is meant by tool signature? | |  |
|  | h) | What are the applications of super finishing operations? | |  |
|  | i) | What is the cause of built up edge? | |  |
|  | j) | Write the formula for calculation of shear strain in metal cutting | |  |
| **Part - B** | | | | |
| 2. |  | Explain the operations performed on lathe(at least 5) with neat diagrams. | | 10M |
|  | | | | |
| 3 | a) | Specify the work and tool holding devices used in a Lathe machine. | | 5M |
|  | b) | Explain with the help of neat sketch, the All geared headstock mechanism in lathe. | | 5M |
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| 4 | a) | Sketch and describe any one quick return mechanism of shaper. | | 5M |
|  | b) | With the help of neat sketch explain the radial drilling machine. | | 5M |
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| 5 | a) | Differentiate between shaping and planing machines | | 5M |
|  | b) | What are the various factors to be considered in selection of a grinding wheel?  Discuss each in detail. | | 5M |
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| 6 | a) | What are the differences between compound indexing and differential indexing?  Explain the relative merits. | | 5M |
|  | b) | Explain any one finishing operation with neat sketch. | | 5M |
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| 7 | a) | List the various types of milling cutters. With a neat sketch explain cutter geometry | | 5M |
|  | b) | Describe schematic diagram of universal milling machine. | | 5M |
|  | | | | |
| 8 | a) | Explain the various types of chips. | | 5M |
|  | b) | Derive the expression for shear angle in orthogonal cutting in terms of rake angle and chip thickness ratio. | | 5M |
|  | | | | |
| 9 | a) | During orthogonal turning of mild steel with a carbide cutting tool of 100 rake angle, the following data has been obtained: width of cut = 2 mm; uncut chip thickness=0.25mm; cutting velocity *V* = 200 m/min; chip thickness = 0.39 mm; *Fc* = 320 N; *Ft* = 170 N. Calculate   1. shear angle b) shear and normal shear force 2. friction angle; d) shear strain; e) specific cutting energy | | 10M |

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