Code No: 07A60308 **R07** **Set No. 2**

III B.Tech II Semester Examinations,December 2010
MACHINE TOOLS AND METROLOGY
Automobile Engineering

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) What are the advantages of pneumatic comparator?
   (b) What are the different errors observed in screw threads? [8+8]
2. Discuss briefly with sketch
   (a) External Surface grinding
   (b) Internal cylindrical grinding
   (c) Form grinding
   (d) Surface grinding. [4×4]
3. (a) Explain the construction and working of a vernier clinometer.
   (b) Explain the construction and working of a universal bevel vernier protractor. [8+8]
4. (a) Explain with neat sketch any four operations performed by milling machine.
   (b) With help of neat diagram explain how T-slots are produced in milling machine. [8+8]
5. (a) Explain the methods used for the generation of threads in a lathe.
   (b) Explain functions of lathe carriers, angle plate and lathe centres. [10+6]
6. (a) Explain the use of light interference microscopes for surface roughness measurement?
   (b) Explain the relationship between type of process used to generate a surface and surface roughness obtained? [8+8]
7. (a) Explain briefly micro drilling, deep hole drilling and deep hole boring.
   (b) Draw the block diagram of jig boring machine and discuss the functions of various elements of it. [8+8]
8. (a) The limits shown on a drawing for a mating hole and shaft are
   $for\ the\ Hole\ 50.000^{+0.046}_{-0.000}\ mm$
   $for\ the\ shaft\ 50.000^{-0.010}_{-0.029}\ mm$
   State the type of fit and find the allowance. What is the greatest possible amount of clearance or interference?
   (b) Write about compound tolerances. [8+8]

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Code No: 07A60308 **R07** **Set No. 4**

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Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
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1. Write short notes on:
   (a) Selection of cutting fluids
   (b) Application of cutting fluids
   (c) Maintenance of cutting fluids. [5+5+6]
2. Explain with neat sketch the following operation in drilling.
   (a) Spot facing
   (b) Counter boring
   (c) Counter sinking
   (d) Tapping
   (e) Trepanning
   (f) Reaming
   (g) Boring. [16]
3. (a) Explain how the minon diameter of external thread can be measured using a micrometer?
   (b) What are comparators? For what purposes they are used? [8+8]
4. (a) Write brief notes, using sketches, on the classification, care and use of slip gauges.
   (b) Write a short notes on profile gauges. [8+8]
5. Explain clearly the following types of fits how can be achieved.
   (a) Selective fit
   (b) Push fit
   (c) Driving fit
   (d) Forced fit
   (e) Shrinkage fit.

   Which of the above are clearance, transition and interference fits? [16]
6. (a) How lapping machines are classified? Explain their features also.
   (b) Differentiate grinding and other finishing operations. [8+8]

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7. (a) How surface texture is related to tolerances on a surface dimensions?
   (b) State the possible causes of each of the various types of irregularities found in surface texture. Show how surfaces having the same numerical assessment may have different properties and texture. [8+8]

8. (a) In turret lathe, prepare a process chart for making square bolt with thread and through hole on head. The hole is normal to the bolt axis.
   (b) Explain briefly functions of various angles in plain milling cutter. [8+8]

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Answer any FIVE Questions
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1. Explain the working principle of tool maker's microscope. What are the uses and specific applications of tool maker's microscope? Explain? [16]

2. (a) Differentiate between 3-jaw chuck and 4-jaw chuck.
   (b) Explain various operations performed on lathe by using chuck. [6+10]

3. (a) Explain clearly what is meant by the system of limits and fits. Why is this system used in engineering practice?
   (b) Explain the terms 'Clearance' 'Interference' and 'Allowance' with respect to the mating conditions of a shaft and a hole. [8+8]

4. (a) What do you understand by number size drill and letter size drill?
   (b) What are the probable effects of incorrect drill feed rates?
   (c) What happen to drill point if drill speed is too high? [5+6+5]

5. (a) Explain the construction and working of a clinometer.
   (b) Explain the steps involved in the determination of work piece angle using Sine bar. [8+8]

6. (a) Derive the expression for MRR and machining time of grinding process.
   (b) Differentiate between traverse grinding and plunge cut grinding. [8+8]

7. (a) What are the differences between compounding indexing and differential indexing? Explain the relative merits and demerits.
   (b) Sketch plain milling machine and discuss uses of various parts in it. [8+8]

8. (a) Explain the use of rollers and slip gauges for the measurement of minor diameter of internal threads?
   (b) Differentiate between geometrical tests and performance tests? [8+8]

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Code No: 07A60308 **R07** **Set No. 3**

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Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
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1. (a) Why chucks are used? List various type of chucks used in lathe Describe any two in brief.
   (b) Explain with neat sketch various operations performed on lathe by holding the work piece between centres. [8+8]
2. (a) Discuss the method of testing the straightness by spirit level and auto collimator?
   (b) What is profilometer? Sketch and explain the use of profilometer? [8+8]
3. (a) What factors contribute to increased production rates in broaching?
   (b) Explain with sketch different elements of a broach and describe them brief. [8+8]
4. (a) Explain the effect of the engineering allowances on the different types of fit required in engineering manufacture.
   (b) What is the importance of interchangeability with respect to an engineering assembly? [8+8]
5. (a) Explain the following alignment tests on lathe.
      i. True running of locating cylinder of main spindle.
      ii. True running of taper socket in main spindle.
   (b) What are the advantages and disadvantages of mechanical comparators?[8+8]
6. (a) Define cross feed, longitudinal feed and vertical feed of a table in horizontal milling machine.
   (b) Sketch any four types of milling cutters and show the various angles. [8+8]
7. (a) Explain how slip gauges are manufactured.
   (b) What is 'Wringing'? What precautions must take while Wringing slip gauges? [8+8]
8. Explain the construction of the following parts of drilling machine
   (a) Base
   (b) Drill head
   (c) Spindle drive
   (d) Feed mechanisms. [4×4]

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