Code No: 136CM **R16**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year II Semester Examinations, November/December - 2020
MACHINE TOOL DESIGN
(Mechanical Engineering)

Time: 2 hours **Max. Marks: 75**

Answer any five questions
All questions carry equal marks
- - -

1. Why hydraulic transmission is used in machine tools? Explain with suitable sketches. [15]

2. A 175 mm long workpiece is to be machined on a shaper which has a cutting stroke to idle stroke velocity ratio of 0.84. Calculate the strokes/min of the shaping tool if the cutting speed is 30m min. Assume an approach and overshoot of 5 mm. [15]

3. Design the feed box of a lathe machine for the feed range 0.05–4.0 mm/rev. Given f = 1.41. Assume a suitable kinematic train between the spindle and the input shaft of the feed box, and between the output shaft of the feed box and the rack, attached to the underside of the lathe bed. [15]

4. With suitable sketches, explain the Speed boxes built into the spindle head. [15]

5. Explain the static and dynamic characteristics of the machine tool as well as the corresponding characteristics of individual elements of which the machine tool is made. [15]

6. A hollow rectangular table is 2 m long, 60 cm wide and 9 cm high. The 15 mm thick horizontal walls of the table are joined by 10 mm thick vertical stiffeners spaced at 400 mm. Calculate the reduced stiffness of the table. [15]

7. Explain the design of slideways for wear resistance. [15]

8. Explain the following:
   a) Wave removal
   b) Wave cutting
   c) Wave removal over wave cutting. [5+5+5]

---ooOoo---

JNTUH USED PAPERS NOV 20