Total No. of printed pages = 3

ME 181402

1/8/22

Roll No. of candidate | | | | | | | | | | |

2022

B.Tech. 4th Semester End-Term Examination

WORKSHOP THEORY AND PRACTICE – I

(New Regulation & New Syllabus)

Full Marks – 70 Time – Three hours

The figures in the margin indicate full marks for the questions.

Answer question No. 1 and any *four* from the rest.

1. Answer the following: (MCQ/Fill in the blanks) : (10 × 1 = 10)

(i) A three jaw universal chuck is also called as ———

(ii) The amount of setover required to turn a taper on the entire length of a workpiece having diameter on the larger end 30 mm and diameter of the small end 20 mm is

(a) 5 mm (b) 10 mm

(c) 15 mm (d) 20 mm

(iii) If a milling cutter has 8 teeth and feed per revolution of the cutter is 4 mm, then feed per tooth is

(a) 2 mm (b) 16 mm

(c) 0.5 mm (c) 4 mm

(iv) In face milling, the thickness of chip is

(a) Minimum at the beginning and end of cut

(b) Minimum at the beginning but maximum at the end of cut

(c) Maximum at the beginning but minimum at the end of cut

(d) None of the above

[Turn over

(v) The shrinkage of liquid material in casting is taken care by the

(a) Riser (b) Runner

(c) Pouring basin (d) Sprue

(vi) The ability of the molding sand to withstand high temperature of the liquid metal without fusion is called

(a) Permeability (b) Refractoriness

(c) Collapsibility (d) None of the above

(vii) What type of bond is used in the following grinding wheel

A36 L 5 B

(a) Vitrified (b) Resinoid

(c) Rubber (d) Silicate

(viii) Which feed is used to grind cylindrical parts with notches or complex shapes?

(a) Through feed (b) In feed

(c) End feed (d) Both through feed and in feed

(ix) In shaper, work is fed at the end of the ——— stroke.

(x) If D is the diameter of tap drill size, T diameter of tap or bolt to be used and d depth of thread then which of the following relationship is correct?

(a) $D = T + 2d$ (b) $D = T + d$

(c) $D = T - 2d$ (d) $D = T - d$

2. (a) What are the operations that can be performed on a center lathe? Calculate the time required on a lathe for one complete cut on a piece of work 500 mm long and 50 mm in diameter. The cutting speed is 40 meters per minute and feed is 0.8 mm per revolution. (3 + 4 = 7)

(b) Apply and show the tumbler gear feed reversing mechanism to change the direction of feed of tool on a center lathe. (8)

3. (a) Differentiate between capstan and turret lathe. (5)

(b) Show and discuss two work holding devices used in drilling operation. (6)

(c) What is tapping operation? Classify the types of taps used. (4)

4. (a) Differentiate between shaper and planer. Calculate the time required in a shaper to take a complete cut on a plate 600 × 1200 mm, if the cutting speed is 9 m/min. The return time to cutting time ratio is 1:4 and the feed is 3 mm. The clearance at each end is 75 mm. (Maximum allowable stroke length = 900 mm). (5 + 5 = 10)

(b) What is broaching operation? Discuss push type and pull type broach. (5)

5. (a) Differentiate between up and down milling operations? Show and discuss any four elements of a plain milling cutter. (4 + 4 = 8)

(b) What is indexing? Apply and discuss simple indexing method to cut 32 flats on circular gear blank in a milling machine using a worm wheel of 40 no of teeth. (7)

6. (a) Show and discuss the working principle of an internal centerless grinding. (8)

(b) Differentiate between glazing and loading of a grinding wheel. (4)

(c) What are the different types of abrasives used in grinding wheel? (3)

7. (a) Discuss the liquid, solidification and solid shrinkages showing time temperature graph for cooling of molten liquid material in sand casting. (6)

(b) A cubical casting of 50 cm size solidifies in 10 minutes. What is the time taken to solidify a cubical casting of 100 cm size made of same material? (4)

(c) What are cores? Show and discuss two types of cores used in sand casting. (5)