Department of Mechanical Engineering
Birla Institute of Technology and Science, Pilani, Pilani campus

ME F112: Workshop Practice

Mid-semester Examination (14/10/2023)

Time: 90 min **Max. Marks:** 60

Name: Student Signature:

Student ID: Invigilator signature:

Note to Students:

1. This is a CLOSED BOOK test.
2. You need to write your answer in the space provided against each question. No extra space/answer sheet will be provided.

---

1. _____ is extensively used for finishing of engine cylinder bores – **[1]**
   a. Lapping
   b. Grinding
   c. Honing
   d. Superfinishing

2. Drilling can be used for generating – **[1]**
   a. Blind hole
   b. Through hole
   c. Both (a) & (b)
   d. Finished holes

3. Gear cutting can be achieved by – **[1]**
   a. Turning
   b. Milling
   c. Drilling
   d. Shaping

4. Machining of ductile materials produce continuous chips (True/False): **[1]**

5. In case of drilling, the workpiece is stationary (True/False): **[1]**

6. ……. is a property of green sand due to which it can sustain very high temperatures without degrading its properties. **[1]**

7. Allowances are provided into a mold for avoiding contraction in the casting (True/False): **[1]**

8. Which one of the following properties enable materials to absorb energy during deformation – **[1]**
   a. Hardness
   b. Tensile strength
   c. Toughness
   d. Ductility

9. Which one of the following material is relatively brittle material – **[1]**
   a. Metal
   b. Ceramic
   c. Polymer
   d. Composites

10. …… acts as a source of molten metal during liquid contraction of a casting. **[1]**

11. A tool life of 80 minutes is obtained at a speed of 30 m/min and 8 minutes at 60 m/min. Determine the following: **[4+1 = 5]**

a) Tool life equation
b) Cutting speed for 4 minutes of tool life

---

12. Find the time required for one complete cut on a piece of work 350 mm long and 50 mm diameter. The cutting speed is 35 m/min, and the feed is 0.5 mm/rev. **[5]**

13. At a speed of 33 m/min and the feed of 0.10 mm/rev of the drill, calculate the time required to drill a 15 mm diameter hole in a 25 mm thick plate. Take the length of approach and length of overtravel as 3 mm each. **[5]**

---

14. A cylindrical aluminum part (r= 250 mm and h= 20 mm) is to be cast using sand casting. If the mold constant is 2.0 sec/mm^2 for aluminum and sand mold. Find out the total time required to solidify the casting. **[1.5+1.5+2 = 5]**

---

15. What is a composite material? Discuss the different types of composite materials. **[2+3 = 5]**

16. Draw a gating system which is generally used for metal casting and label its different components. **[2+3 = 5]**

17. Why is grinding an energy intensive process as compared to turning? Explain with a schematic. **[10]**

18. What is the pattern? With suitable schematic diagrams, discuss different types of pattern allowances that are used to accommodate various dimensional variations of a component during casting. **[2.5+7.5 = 10]**

Rough Sheet