Indian Maritime University

(A Central University, Govt. of India)

Mar/Apr'26 SE

Programme Name: B Tech (ME)

Semester: I

Subject Code: UG11T5104

Subject Name: Workshop Technology

Date: 07.03.2026	**Max Marks: 70**
Duration: 03 Hrs	**Pass Marks: 35**

General Instructions:

(i) All Sections (A, B & C) are to be attempted.
(ii) Options, if any, are specified in respective section.

Section A

Ten MCQs/Fill in the Blanks of 01 Mark each – Choose the correct answer as applicable.

1. In a shaper's quick return mechanism, what motion does the slotted link convert?
(a) Rotary motion to reciprocating motion
(b) Reciprocating motion to rotary motion
(c) Reciprocating motion to linear Motion
(d) None of the above

2. For simple indexing, if the indexing plate has 24 holes, to divide the work into 8 equal parts, the crank should be moved through:
(a) 6 turns and any number of holes
(b) 10 turns and 5^{th} number holes
(c) 15 turns and 24^{th} number holes
(d) 5 turns only

3. The process of enlarging an existing hole to accurate size with a smooth finish is called:
(a) Counter boring
(b) Counter sinking
(c) Reaming
(d) Spot facing

4. What is the term used for the condition when metal particles get stuck in the teeth of a file?
(a) Choking
(b) Loading

(c) Pinning
(d) Blocking

5. In the tool signature "8°–10°–6°–8°–15°–16°–1 mm", what does the second angle (10°) represent?
a) Side rake angle
b) Back rake angle
c) Side relief angle
d) End relief angle

6. The primary purpose of Lockout-Tagout (LOTO) is to:
(a) Increase machine productivity
(b) Prevent accidental start-up of machines during maintenance
(c) Reduce energy consumption
(d) Improve machine accuracy

7. What does the grade of a grinding wheel indicate?
(a) Size of abrasive grains
(b) Type of abrasive material
(c) Bonding strength of abrasives
(d) Wheel speed

8. What is the fundamental working principle of resistance welding?
(a) Current passes through electrodes to melt the metal
(b) Pressure is applied to resist arc formation
(c) Current passes through metals under pressure to generate heat at the interface
(d) Metals are fused using chemical flux

9. During automatic screw cutting, what mechanism is used to synchronize the spindle rotation with the carriage feed?
(a) Tailstock alignment
(b) Lead screw and change gears
(c) Feed rod only
(d) Threading dial only

10. In the designation of tolerance grade 50H7g6, the number "**50**" and "**g**" represents:
a) Fundamental deviation and Position of tolerance zone for the hole
b) Basic size and Position of tolerance zone for the shaft.
c) Actual size and Position of tolerance zone for the shaft.
d) Shaft deviation and Position of tolerance zone for the hole.

Section B

Five Questions of 02 Marks each

11. Explain the concept of machinability index.

12. Define the term honing.

13. Explain the different parameters used to specify a lathe machine.

14. Explain the importance of correct polarity selection in arc welding.

15. Mention the various PPE used in Engine room on board ship.

Section C

Seven Questions of 10 Marks each of which any 05 questions to be answered.

16. (a) Explain with a sketch the working of a radial drilling machine. State its advantages over other drilling machines.

    (b) Explain the process of counter boring and spot facing. Mention their applications. **(06 Marks + 04 Marks)**

17. (a) Explain, with the help of a diagram, the taper turning process using the compound rest on a lathe. Discuss its advantages and limitations.

    (b) Describe the process of thread cutting on a lathe machine.

    (06 Marks+04 Marks)

18. (a) What is grindability? What safety precautions should be followed while performing grinding operations on a grinding machine?

    (b) Describe the term "dressing" of a grinding wheel and why it is necessary.

    (06 Marks+04 Marks)

19. (a) Draw neat sketches of a feeler gauge and a hermaphrodite caliper. Explain their construction and uses in a marine workshop.

    (b) What is pattern and pattern making scale? Explain their importance and use in foundry work. **(06 Marks+04 Marks)**

20. (a) Describe the nomenclature of a single-point cutting tool. Support your answer with a neat sketch.

    (b) Describe the important properties and functions of cutting fluids used in machining operations. **(06 Marks+04 Marks)**

21. (a) Describe the different flames produced in gas welding, their uses, and illustrate them with a neat sketch.

(b) With the help of a diagram, describe the principle of TIG welding.

(06 Marks+04 Marks)

22. (a) Draw a neat sketch of a column and knee type milling machine and explain its main parts.

(b) Mention four common causes of accidents in workshops and how they can be prevented. **(06 Marks+04 Marks)**