| C–4487 | Sub. Code |
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| | 60415/<br>60515/<br>60615 |

**B.Voc. DEGREE EXAMINATION, APRIL 2025.**

**First Semester**

**PRODUCTION TECHNOLOGY**

**(Common for Industrial Automation/ Manufacturing Technology/ Production Technology)**

**(2023 onwards)**

Duration : 3 Hours Maximum : 75 Marks

**Part A** (10 × 1 = 10)

Answer **all** questions.

1. Which type of chip is characterized by continuous, long and helical curls during metal cutting?

   (a) Continuous chip (b) Discontinuous chip

   (c) Serrated chip (d) Built-up edge chip

2. What does the term "tool life" in metal cutting refer to?

   (a) The total time a tool is in use

   (b) The durability of the tool material

   (c) The period between tool changes

   (d) The number of components produced before tool replacement

3. What is the primary function of a reamer in machining processes?

(a) Cutting internal threads

(b) Enlarging existing holes with high precision

(c) Creating external threads

(d) Boring large-diameter holes

4. Which tool is used for creating internal threads in a drilled hole?

(a) Lathe (b) Drill

(c) Tap (d) Reamer

5. What is the primary purpose of broaching in machining processes?

(a) Boring internal holes

(b) Creating external threads

(c) Generating internal keyways or splines

(d) Milling flat surfaces

6. In gear manufacturing by machining, what type of cutter is commonly used to produce gears with straight teeth?

(a) Hob (b) Broach

(c) End mill (d) Face mill

7. Which grinding operation is specifically designed for producing gears with accurate tooth geometry?

(a) Surface grinding

(b) Cylindrical grinding

(c) Gear grinding

(d) Centerless grinding

8. What is the purpose of deburring in finishing operations?

(a) Increasing material strength

(b) Enhancing surface roughness

(c) Removing sharp edges and burrs

(d) Applying protective coatings

9. In ultrasonic machining, material removal is achieved through the application of:

(a) Heat

(b) High-frequency vibrations

(c) Chemical reactions

(d) Pulsed laser beams

10. Which modern machining technique utilizes a high-velocity stream of abrasive particles suspended in a gas or liquid for material removal?

(a) Electrochemical Machining

(b) Abrasive Jet Machining

(c) Water Jet Machining

(d) Ultrasonic Machining

## Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Explore the forces and power involved in metal cutting. Discuss the cutting forces acting on the tool and workpiece, as well as the power requirements for effective metal cutting operations.

Or

(b) Analyze the impact of temperature in metal cutting processes. Discuss how temperature affects tool wear, workpiece material properties and overall machining efficiency.

12. (a) Discuss the processes involved in cutting screw threads, including the types of threads produced and the tools used. Highlight the importance of precision in screw thread machining.

Or

(b) Explore the processes of boring and the different types of boring machines. Discuss the applications of boring in producing accurate internal cylindrical surfaces.

13. (a) Explain the principles of planning and shaping in machine tool operations. Compare and contrast the processes, highlighting their applications and limitations.

Or

(b) Explore the broaching process and the types of broaching machines used in manufacturing. Discuss the advantages and challenges of broaching in producing complex internal shapes.

14. (a) Explore the specific requirements and considerations in designing grinding operations. Discuss factors such as wheel selection, speeds and feeds, and their impact on the efficiency of grinding processes.

Or

(b) Discuss the importance of grinding fluids in abrasive machining. Explain how grinding fluids contribute to cooling, lubrication and chip removal, and their role in achieving quality finishes.

15. (a) Explore the principles and applications of abrasive flow machining. Discuss how this process is used for deburring, polishing and improving the surface finish of complex components.

Or

(b) Discuss the working principles and applications of ultrasonic machining. Highlight the advantages and limitations of ultrasonic machining compared to traditional machining methods.

## Part C (5 × 8 = 40)

Answer **all** questions, choosing either (a) or (b).

16. (a) Discuss the importance of surface finish and integrity in metal cutting processes. Explain how cutting parameters influence the final surface quality of machined components.

Or

(b) Provide a comprehensive analysis of the factors influencing tool life in metal cutting. Discuss wear mechanisms, failure modes and strategies for optimizing tool life in various machining applications.

17. (a) Explore the tapping process and the use of taps in machining. Discuss the different types of taps, their applications and the considerations for achieving accurate internal threads.

Or

(b) Compare and contrast the machining processes of turning, boring, drilling, reaming, and tapping. Highlight the specific advantages, limitations and applications of each process in producing round shapes.

18. (a) Provide a comprehensive analysis of gear manufacturing by machining. Discuss the different methods of gear cutting, including hobbing and shaping and their applications in producing gears.

Or

(b) Compare the advantages and limitations of milling, planning, shaping, broaching and gear manufacturing by machining. Discuss the specific scenarios where each process is most suitable for shaping various workpieces.

19. (a) Provide a comprehensive overview of finishing operations in machining, with a focus on deburring. Discuss the different deburring methods and their significance in achieving smooth and safe machined components.

Or

(b) Compare the advantages and limitations of various abrasive machining processes. Discuss the specific scenarios where surface grinding, cylindrical grinding and gear grinding are most suitable for achieving precision in manufacturing.

20. (a) Explain the working principles of water jet machining. Discuss the advantages, challenges and applications of water jet machining in the manufacturing industry.

Or

(b) Analyze the principles and applications of electrochemical machining. Discuss the advantages and limitations of this unconventional machining process, especially in terms of material removal and surface finish.

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**B.Voc. DEGREE EXAMINATION, APRIL 2025.**

**Fourth Semester**

**Industrial Automation**

**LOW COST AUTOMATION**

**(2023 onwards)**

Duration : 3 Hours Maximum : 75 Marks

**Part A** $(10 \times 1 = 10)$

Answer **all** questions.

1. Which of the following is an advantage of fluid power systems?

   (a) Low power density

   (b) High efficiency

   (c) Limited control flexibility

   (d) High energy loss

2. Pascal's Law states that pressure applied to a confined fluid is:

   (a) Transmitted equally in all directions

   (b) Not transmitted

   (c) Transmitted only upwards

   (d) Transmitted partially

3. Which component is used for controlling the direction of hydraulic fluid?

(a) Actuator

(b) Flow control valve

(c) Direction control valve

(d) Reservoir

4. The primary function of a hydraulic motor is to:

(a) Store energy

(b) Convert fluid energy to mechanical energy

(c) Control fluid pressure

(d) Filter hydraulic fluid

5. What is the purpose of an accumulator in a hydraulic system?

(a) Generate power (b) Store energy

(c) Reduce pressure (d) Increase friction

6. In a hydrostatic transmission system, power is transmitted through:

(a) Electrical cables

(b) Mechanical gears

(c) Hydraulic fluid

(d) Pneumatic air

7. Which of the following is a type of air compressor?

(a) Centrifugal (b) Reciprocating

(c) Rotary screw (d) All of the above

8. A pneumatic system primarily uses:

(a) Water (b) Air

(c) Oil (d) Gasoline

9. Troubleshooting of a hydraulic system includes:
   (a) Checking for leaks
   (b) Ignoring pressure variations
   (c) Removing filters
   (d) Bypassing control valves

10. Low-cost automation in fluid power systems is mainly used for:
   (a) Increasing energy consumption
   (b) Reducing operational cost
   (c) Complicating the system
   (d) None of the above

**Part B** $(5 \times 5 = 25)$

Answer **all** questions, choosing either (a) or (b).

11. (a) Explain the advantages and applications of fluid power systems.

Or

(b) Describe Pascal's Law and its significance in hydraulic systems.

12. (a) What are hydraulic actuators? Explain their types and applications.

Or

(b) Discuss the construction and working of hydraulic motors.

13. (a) Explain the function and working of accumulators in hydraulic systems.

Or

(b) Describe the concept of hydrostatic transmission with applications.

14. (a) Explain the role of FRL unit in a pneumatic system.

Or

(b) Describe the function and operation of quick exhaust valves.

15. (a) What are the common troubleshooting steps in hydraulic and pneumatic systems?

Or

(b) Explain the design considerations for hydraulic circuits in industrial applications.

**Part C** ($5 \times 8 = 40$)

Answer **all** questions, choosing either (a) or (b).

16. (a) Discuss the different types of hydraulic pumps and their applications.

Or

(b) Explain the selection criteria for hydraulic pumps in various industrial processes.

17. (a) Explain the different types of pressure control valves and their working principle.

Or

(b) Describe the construction and function of servo and proportional valves.

18. (a) Explain the importance and working of pneumatic logic circuits.

Or

(b) Discuss the cascade method in the design of pneumatic circuits.

19. (a) Explain the process of troubleshooting hydraulic circuits with real-world examples.

Or

(b) Discuss the significance of low-cost automation in modern manufacturing systems.

20. (a) Design a hydraulic circuit for shaping machine application and explain its operation.

Or

(b) Design a pneumatic circuit for tool handling in a CNC machine and explain its working.

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**B.Voc. DEGREE EXAMINATION, APRIL 2025.**

**Fourth Semester**

**Industrial Automation**

**PROFESSIONAL ETIQUETTES**

**(2023 onwards)**

Duration : 3 Hours Maximum : 75 Marks

**Part A** (10 × 1 = 10)

Answer **all** questions.

1. What is the significance of business etiquette in the 21st century?

   (a) Enhances professional image

   (b) Increases personal connections

   (c) Reduces working hours

   (d) Minimizes expenses

2. Which of the following is an example of proper workplace etiquette?

   (a) Overusing social media at work

   (b) Using appropriate tone of voice

   (c) Ignoring ethical dilemmas

   (d) Using offensive language in emails

3. What should every official email contain?

(a) Casual language

(b) Detailed personal information

(c) Professional email address and subject line

(d) Multiple fonts and colors

4. What is the primary purpose of telephone etiquette?

(a) To ignore customer concerns

(b) To establish clear and respectful communication

(c) To avoid answering calls

(d) To use informal language

5. What is considered a good practice when managing a meeting?

(a) Ignoring the agenda

(b) Assigning random tasks to participants

(c) Setting clear objectives and time limits

(d) Avoiding feedback

6. What is the key aspect of dining etiquette in a business setting?

(a) Talking loudly

(b) Using cutlery improperly

(c) Maintaining proper posture

(d) Arriving after the meal starts

7. What is the main focus of interview etiquette?

(a) Dressing casually

(b) Over talking during the interview

(c) Presenting oneself professionally

(d) Ignoring the interviewer

8. Which is a recommended strategy for public speaking?

(a) Speaking too fast

(b) Ignoring the audience's reaction

(c) Injecting humor and encouraging Q & A

(d) Avoiding pauses

9. What is the key component when designing a presentation?

(a) Using excessive animations

(b) Focusing on color schemes, font size, and content

(c) Writing large paragraphs

(d) Ignoring body language

10. What can cultural insensitivity in business etiquette lead to?

(a) Building stronger relationships

(b) Misunderstandings and conflicts

(c) Increased productivity

(d) Better team dynamics

## Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Explain the significance of business etiquette in today's professional world.

Or

(b) Discuss the importance of professional appearance and grooming in business etiquette.

12. (a) What are the basic email etiquettes every professional should follow?

Or

(b) Describe the role of telephone etiquette in establishing effective communication in business settings.

13. (a) Discuss the key factors in managing a business meeting effectively.

Or

(b) Explain the essentials of dining etiquette in a professional setting.

14. (a) What are the best practices for preparing for a job interview?

Or

(b) Discuss the importance of public speaking etiquette and its impact on professional presentations.

15. (a) How can one design a great presentation for a professional setting?

Or

(b) Explain how multicultural challenges impact business etiquette and ways to address them.

**Part C** $(5 \times 8 = 40)$

Answer **all** questions, choosing either (a) or (b).

16. (a) Discuss how the use of business etiquette can contribute to professional success in the modern workplace.

Or

(b) Explain the role of business etiquette in managing professional relationships and office culture.

17. (a) Describe the significance of email etiquette in maintaining professional communication standards.

Or

(b) Discuss the challenges and strategies of telephone etiquette in customer service roles.

18. (a) Analyze the components of effective meeting etiquette and how they contribute to productive meetings.

Or

(b) Discuss the cultural differences in dining etiquette and their influence on international business relationships.

19. (a) Examine the key interview etiquette practices that can help a candidate succeed in a job interview.

Or

(b) Explain the role of public speaking etiquette in influencing the effectiveness of corporate presentations.

20. (a) Analyze the impact of presentation etiquette on audience engagement and retention.

Or

(b) Discuss the importance of being aware of multicultural differences when interacting in business environments.

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