

5010

F.Y. (CME) Sem II



Bharatiya Vidya Bhavan's



**Sardar Patel College of Engineering**

(A Government Aided Autonomous Institute)

Munshi Nagar, Andheri (West), Mumbai – 400058.

**End Semester Exam**

**May 2026**

**Communication Skills**

187526

Max. Marks: 100

Hours

Class: F.Y. B. Tech (CME)

Tech

Course Code: AE BT 201

**Semester: II**

Duration: 3

Program: B.

NOTE:

- Question number **One** is compulsory.
- Out of remaining **Six** questions attempt any four
- Please write subsections of questions in a sequence
- Draw diagrams and charts wherever necessary

| Sr.No     | Questions                                                                                                                                                                                                                                         | Points | CO | BL |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|----|----|
| Q.1.<br>A | Evaluate the effectiveness of formal and informal channels of communication in a business organisation. discuss the advantages, limitations, of Horizontal channel of communication.                                                              | 12     | 02 | 01 |
| Q.1.B     | Short Notes on any ONE<br>a. AIDA principles of sales letter with examples<br>b. Socio-psychological barriers to communication<br>c. Listening Skills – Discus barriers, and types of Listening skills and strategies to improve listening skills | 08     | 02 | 02 |
| Q.2.A     | Explain the basic characteristics of Communication Briefly explain the Johari Window model of effective communication theory Highlight its relevance to modern organisational communication.                                                      | 12     | 03 | 03 |
| Q.2.B     | Explain the principles of business correspondence in detail                                                                                                                                                                                       | 08     | 02 | 01 |
| Q.3.A     | An educational institute, Bright Future Academy, 121 B lane, Samarth Nagar, Bangalore has written to your company enquiring                                                                                                                       | 12     |    |    |

|         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |    |    |    |
|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|
|         | <p>about ergonomic benches for their classrooms. They are particularly interested in the design features that support student posture and comfort, durability and maintenance requirements, pricing and bulk order discounts, delivery timelines and installation support. As the Sales Manager of Edu Furn Solutions Pvt. Ltd.,</p> <p>Draft a <b>formal reply letter</b> to the enquiry. Your letter should convert the reply into an order. Invent Necessary details. ( Use Semi Block Form)</p>                                                                                                                                                                                                                                              |    |    |    |
| Q.3.B   | <p>"Reading is Learning from an absent teacher". In view of the above explain the importance of reading, the barriers affecting reading skills and elaborate on the Mind mapping and Eye training to improve reading.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 08 |    |    |
| Q.4. A. | <p>You are a first-year student of <i>sardar Patel college of Engineering</i>. As per the requirement of NEP every student has to complete a 15 days internship in their respective field of interest. The First Year Head of Department has asked each branch to draft a formal email to potential companies/ Institutes/ Start-ups. Draft a formal email enquiring about internship opportunities. Please keep the principal in CC.</p>                                                                                                                                                                                                                                                                                                        | 12 |    |    |
| Q.4. B  | <p>Draw the Complete block format mentioning the compulsory and optional parts of the letter.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 08 |    |    |
| Q.5.A   | <p>Describe with quotes the importance of non-verbal communication in business interactions. Explain in detail the aspects of Body language in effective communication.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 12 | 04 | 05 |
| Q.5.B   | <p><b>Case Study</b></p> <p>A German engineering firm is collaborating with an Indian IT company on a smart manufacturing project. During a virtual meeting:</p> <ul style="list-style-type: none"> <li>The German project lead uses highly technical jargon and abbreviations (e.g., "MES," "SCADA," "Kanban loops"), which confuse some Indian team members unfamiliar with these terms.</li> <li>The video call suffers from poor connectivity, causing delays and distorted audio.</li> <li>The German team expects punctuality and strict adherence to agenda, while the Indian team members occasionally join late and prefer a more flexible discussion style.</li> <li>One Indian engineer uses humor and casual phrases like</li> </ul> | 08 | 04 | 05 |

|         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |    |    |    |
|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|
|         | <p>"chalta hai" (it's okay), which the German team interprets as lack of seriousness.</p> <p><b>Questions:</b></p> <ol style="list-style-type: none"> <li>1. Identify the <b>semantic barriers</b> in this case. 01</li> <li>2. Identify the <b>physical barriers</b> in this case. 01</li> <li>3. Identify the <b>cultural barriers</b> in this case. 02</li> <li>4. Explain how these barriers interact to worsen miscommunication. 02</li> <li>5. Suggest strategies to overcome at least two of these barriers. 02</li> </ol>                                                                                                                                                                   |    |    |    |
| Q.6.A   | <p>You are the Purchase Officer at <i>Bright Future Academy</i>. Last month, your institute ordered <b>50 ergonomic benches</b> from <i>Paras solutions. Ltd.</i> for classroom use. After delivery, you noticed several issues, few benches have uneven legs, making them unstable. The promised lumbar support feature is missing in many units. Some benches arrived with scratches and chipped edges. The delivery was delayed by two weeks, causing inconvenience during the new semester.</p> <p>Draft a <b>formal complaint letter</b> to the Customer Service Manager of <i>Paras Solutions Pvt Ltd.</i> Asking for fair compensation for the damaged items. (Use Complete Block Form).</p> | 12 | 04 | 01 |
| Q.6.B   | Describe the importance of Grapevine in an organisation. Explain the advantages and limitations of Grapevine communication.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 08 |    |    |
| Q.7. A  | "Spoken Words wields great Power". In the context of this statement, elucidate the importance of speaking skills and the barriers to speaking. Describe strategies for effective public speaking.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 12 |    |    |
| Q.7. B. | Explain the process of communication and its elements. Why is Communication skills important for engineers.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 08 |    |    |



# SARDAR PATEL COLLEGE OF ENGINEERING

(Government Aided Autonomous Institute)  
Munshi Nagar, Andheri (W) Mumbai - 400058



END SEMESTER EXAMINATION MAY 2026 / ~~RE-EXAM~~ JULY 2026

Program: Civil/Mechanical/Electrical

*sem II*

Duration: 3 hours

Course Code: BS-BTC201/BTM201/BTE201

Maximum Points: 100

Course Name: ICDN

Semester: II

1. Use of non-programmable calculator is allowed
2. All questions are compulsory

| Q.No. | Questions                                                                                                                          | Points | CO | BL    | Modu No. |
|-------|------------------------------------------------------------------------------------------------------------------------------------|--------|----|-------|----------|
| 1a)   | Find length of the loop of the curve $3ay^2 = x(x-a)^2$                                                                            | 06     | 3  | 3,4,5 | 3        |
| 1b)   | Prove that : $\int_0^{\infty} \sqrt{t} e^{-t^2} dt \cdot \int_0^{\infty} \frac{e^{-t^2}}{\sqrt{t}} dt = \frac{\pi}{2\sqrt{2}}$     | 06     | 3  | 2,4,5 | s.s      |
| 1c)   | Evaluate $\iiint \frac{1}{(1+x+y+z)^3} dx dy dz$ over the volume of the tetrahedron $x=0, y=0, z=0, x+y+z=1$                       | 08     | 3  | 3,4,5 | 5        |
| 2a)   | Evaluate $\iint xy dx dy$ over the region bounded by the x-axis, ordinate $x=2a$ and parabola $x^2=4ay$ .                          | 06     | 3  | 2,4,5 | 4        |
| 2b)   | Find the area of the cardioid $r = a(1 + \cos \theta)$                                                                             | 06     | 2  | 3,4,5 | 5        |
| 2c)   | Solve $\left( \frac{\log y - 1}{\sqrt{x^2 + 1}} + x^2 \right) dx + \frac{1}{y} \log(x + \sqrt{x^2 + 1}) dy = 0$ . (given $y > 0$ ) | 08     | 1  | 2,4,5 | 1        |
| 3a)   | Solve $(1 + y^2) dx = (e^{\tan^{-1} y} - x) dy$                                                                                    | 06     | 1  | 2,4,5 | 1        |
| 3b)   | Change to polar coordinates and evaluate $\int_0^1 \int_0^x (x+y) dy dx$ .                                                         | 06     | 2  | 4,5   | 3        |
| 3c)   | solve $(2x+1)^2 \frac{d^2 y}{dx^2} - 2(2x+1) \frac{dy}{dx} - 12y = 6x$                                                             | 08     | 2  | 2,4,5 | 2        |



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**END SEMESTER EXAMINATION MAY 2026 / RE - EXAM JULY 2026**

|     |                                                                                                                                                                                                                         |    |   |       |     |
|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|---|-------|-----|
| 4a) | Prove that $\int_0^3 \frac{x^{3/2}}{\sqrt{3-x}} dx + \int_0^1 \frac{1}{\sqrt{1-x^{1/4}}} dx = \frac{432\pi}{35}$                                                                                                        | 06 | 3 | 2,4,5 | s.s |
| 4b) | Find the mass of lamina founded by the curve in $y^2 = ax, x^2 = ay$ where density of the lamina at any point varies as the square of its distance from the origin.                                                     | 06 | 3 | 3,4,5 | 5   |
| 4c) | If $\frac{dy}{dx} = y - x$ and $y(0) = 2$ then using Taylor's series find $y$ at $x = 0.4$ .<br>Compare the result with exact solution.                                                                                 | 08 | 1 | 1,4,5 | 1   |
| 5a) | Change the order of integration<br>$\int_0^4 \left\{ \int_{y/2}^{9-y} \phi(x, y) dx \right\} dy$                                                                                                                        | 06 | 2 | 2,4,5 | 3   |
| 5b) | Using Euler method find $y(0.06)$ given $\frac{dy}{dx} = y + x^2, y(0) = 1$ with $h = 0.02$                                                                                                                             | 06 | 1 | 1,4,5 | 1   |
| 5c) | Solve $(D^2 + 2D + 3)y = x - x^2$                                                                                                                                                                                       | 08 | 1 | 4,5   | 2   |
| 6a) | Change the order of integration and evaluate $\int_0^1 \left\{ \int_x^{2-x} \frac{x}{y} dy \right\} dx$ .                                                                                                               | 06 | 2 | 4,5   | 2   |
| 6b) | Solve $x \sin x \frac{dy}{dx} + y(x \cos x - \sin x) = 2$                                                                                                                                                               | 06 | 1 | 2,4,5 | 1   |
| 6c) | Solve $\frac{dy}{dx} = xy$ with initial conditions $y(1) = 2$ and find $y$ at $x = 1.2, 1.4$ by Runge - Kutta Method of Fourth Order                                                                                    | 08 | 1 | 1,4,5 | 1   |
| 7a) | In a circuit containing inductance $L$ , resistance $R$ and voltage $E$ , the current $i$ is given by<br>$L \frac{di}{dt} + Ri = E$ . Find the current $i$ at time $t$ if at $t = 0, i = 0$ and $L, R, E$ are constants | 06 | 3 | 3,5   | 5   |
| 7b) | Evaluate $\int_0^{\log 2} \int_0^x \int_0^{x+y} e^{x+y+z} dx dy dz$                                                                                                                                                     | 06 | 2 | 4,5   | 4   |



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**END SEMESTER EXAMINATION MAY 2026 / ~~RE-EXAM~~ JULY 2026**

|     |                                     |    |   |   |   |
|-----|-------------------------------------|----|---|---|---|
| 7c) | State and prove Duplication formula | 08 | 3 | 1 | 4 |
|-----|-------------------------------------|----|---|---|---|



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End Semester Examination/ Re-Examination, May /June 2026



Max. Marks: 100

Class: F.Y. BTech

Semester: II

Name of the Course: Basic Electrical and Electronics Engg.

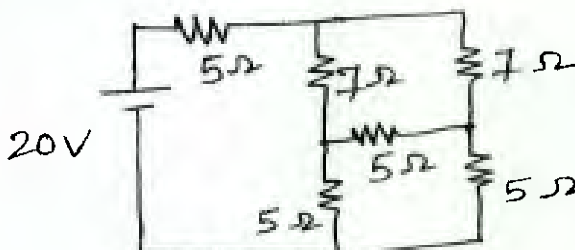
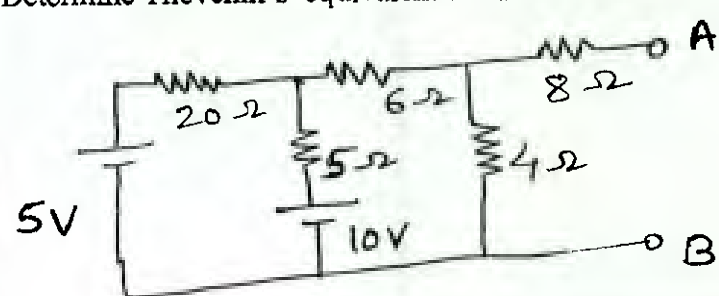
Duration: 3Hr

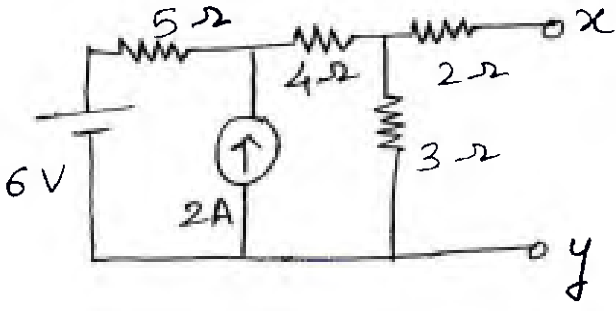
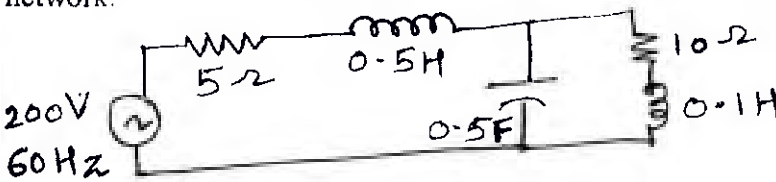
Program: B.Tech Mechanical

Course Code: ES-BTM201

## Instructions:

- 1) Question No 1 is compulsory. Solve any four from questions 2 to 7.
- 2) In the absence of any data, make suitable assumptions and justify the same.
- 3) Answer to a question should be grouped together.

| Q. No | Question                                                                                                                                                                       | Max. Marks | Course Outcome | Mod. No. |
|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|----------------|----------|
| Q1 a  | Discuss any one sensor in detail. Consider following points- working principle, applications.                                                                                  | 05         | 04             | 05       |
| Q1 b  | Differentiate between three phase induction motor and single phase induction motor.                                                                                            | 05         | 02             | 03       |
| Q1 c  | Explain how a Zener diode acts as a voltage regulator.                                                                                                                         | 05         | 03             | 04       |
| Q1 d  | Consider a series RC circuit excited by a single phase AC source. Draw phasor diagram and derive expression for current and power in the circuit.                              | 05         | 01             | 02       |
| Q2 a  | <p>Consider a network given below. Determine current and power supplied by the source.</p>  | 10         | 01             | 01       |
| Q2 b  | <p>Determine Thevenin's equivalent circuit across terminal AB.</p>                         | 10         | 01             | 01       |

|         |                                                                                                                                                                                                                                                                                                                                                                                          |    |    |    |
|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|
| Q3<br>a | <p>State maximum power transfer theorem and hence calculate the load resistance to be connected across xy terminals for maximum power transfer. Also calculate maximum power.</p>                                                                                                                       | 10 | 01 | 01 |
| Q3<br>b | <p>A capacitor of <math>100\ \mu\text{F}</math> is connected across a <math>230\ \text{V}</math>, <math>50\ \text{Hz}</math> supply. Calculate the capacitive reactance, power factor and current. Draw phasor diagram. Plot current and voltage waveform. What values of resistance should be added in series such that power factor is 0.5.</p>                                        | 10 | 01 | 01 |
| Q4<br>a | <p>An AC voltage source supplies voltage <math>V_s = 325 \sin(314t + 30^\circ)</math> volts. Determine RMS value, Frequency and Phase angle of the source voltage. This voltage source is connected across a series RL circuit with <math>R = 5\ \Omega</math> and <math>L = 0.1\ \text{H}</math>. Calculate current and voltage across inductor, power factor. Draw phasor diagram.</p> | 10 | 01 | 02 |
| Q4<br>b | <p>Explain working principle of single phase induction motor. Explain why a single-phase induction motor is not self-starting? Explain any one starting method.</p>                                                                                                                                                                                                                      | 10 | 01 | 01 |
| Q5<br>b | <p>A balanced star-connected load has an impedance of <math>(4 + j3)\ \Omega</math> per phase and is connected to a <math>400\ \text{V}</math>, <math>50\ \text{Hz}</math>, 3-phase supply. Determine the line current, phase current, line voltage, phase voltage. Also determine real and reactive power consumption.</p>                                                              | 10 | 01 | 02 |
| Q5<br>b | <p>Explain working principle of a transformer. List different types of transformer and explain their use.</p>                                                                                                                                                                                                                                                                            | 10 | 02 | 02 |
| Q6<br>a | <p>Explain working principle and characteristics of a n-p-n transistor. Explain its use as a switch?</p>                                                                                                                                                                                                                                                                                 | 10 | 03 | 03 |
| Q6<br>b | <p>Explain the working principle of a half-wave bridge rectifier with suitable waveforms. Compare half-wave and full-wave rectifiers.</p>                                                                                                                                                                                                                                                | 10 | 03 | 04 |
| Q7<br>b | <p>Calculate current and voltage across <math>10\ \Omega</math> resistor in the following network.</p>                                                                                                                                                                                               | 10 | 01 | 01 |
| Q7<br>b | <p>List and discuss different characteristics of sensors. Name the sensors that can be used for sensing following physical parameter- pressure, temperature, speed, position, level</p>                                                                                                                                                                                                  | 10 | 04 | 03 |

**ENDSEM/RE-EXAMINATION MAY/JUNE 2026****Program: B.Tech. in Mechanical Engineering***Sem II***Duration: 3 hrs.****Course Code: PC-BTM201****Maximum Points: 100****Course Name: Manufacturing Processes****Semester: II****Notes:**

1. Question 1 is compulsory.
2. Attempt **any 4** questions from Q2 to Q7.
3. Answer to sub questions should be strictly grouped together.
4. Answers should be clearly readable. Avoid scribbling.
5. Draw neat labelled diagram wherever necessary.
6. Assume suitable data only if necessary.

| Q. No.                            | Questions                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Points         | CO                         | BL                         | Module No.                 |                                   |   |             |   |                         |   |                      |   |    |    |    |    |
|-----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------------------|----------------------------|----------------------------|-----------------------------------|---|-------------|---|-------------------------|---|----------------------|---|----|----|----|----|
| Q.1.                              | Attempt <b>any four</b> : (05 points each)<br>a. Explain expendable pattern casting process with diagram and advantages.<br>b. Describe solid state friction welding with a neat sketch diagram.<br>c. Draw a neat sketch of Single point cutting tool for lathe machine showing all the principle tool angles.<br>d. Distinguish between 4 axis and 5-axis CNC machines.<br>e. List and describe different types of abrasives used for the surface grinding process. | 20             | 01<br>01<br>01<br>02<br>02 | 02<br>02<br>03<br>02<br>02 | 01<br>02<br>03<br>04<br>05 |                                   |   |             |   |                         |   |                      |   |    |    |    |    |
| Q.2. a                            | Match the defects in casting process with their standardized letter nomenclature? <table border="1"><thead><tr><th>Casting Defect</th><th>Standardized Letter</th></tr></thead><tbody><tr><td>1. Inclusions</td><td>A</td></tr><tr><td>2. Incorrect dimensions and Shape</td><td>B</td></tr><tr><td>3. Cavities</td><td>D</td></tr><tr><td>4. Metallic projections</td><td>F</td></tr><tr><td>5. Defective Surface</td><td>G</td></tr></tbody></table>                | Casting Defect | Standardized Letter        | 1. Inclusions              | A                          | 2. Incorrect dimensions and Shape | B | 3. Cavities | D | 4. Metallic projections | F | 5. Defective Surface | G | 05 | 02 | 01 | 01 |
| Casting Defect                    | Standardized Letter                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                |                            |                            |                            |                                   |   |             |   |                         |   |                      |   |    |    |    |    |
| 1. Inclusions                     | A                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                |                            |                            |                            |                                   |   |             |   |                         |   |                      |   |    |    |    |    |
| 2. Incorrect dimensions and Shape | B                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                |                            |                            |                            |                                   |   |             |   |                         |   |                      |   |    |    |    |    |
| 3. Cavities                       | D                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                |                            |                            |                            |                                   |   |             |   |                         |   |                      |   |    |    |    |    |
| 4. Metallic projections           | F                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                |                            |                            |                            |                                   |   |             |   |                         |   |                      |   |    |    |    |    |
| 5. Defective Surface              | G                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                |                            |                            |                            |                                   |   |             |   |                         |   |                      |   |    |    |    |    |
| Q. 2 b                            | Explain any three casting defects.                                                                                                                                                                                                                                                                                                                                                                                                                                    | 05             | 01                         | 02                         | 01                         |                                   |   |             |   |                         |   |                      |   |    |    |    |    |
| Q.2. c                            | Classify welding processes.                                                                                                                                                                                                                                                                                                                                                                                                                                           | 05             | 02                         | 01                         | 02                         |                                   |   |             |   |                         |   |                      |   |    |    |    |    |

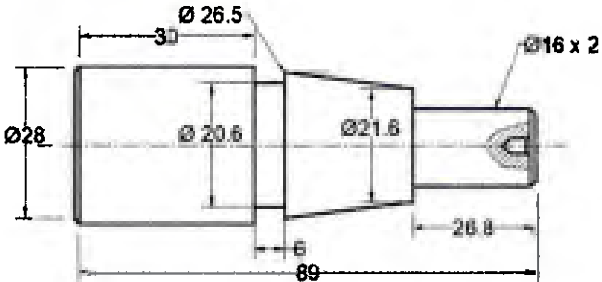
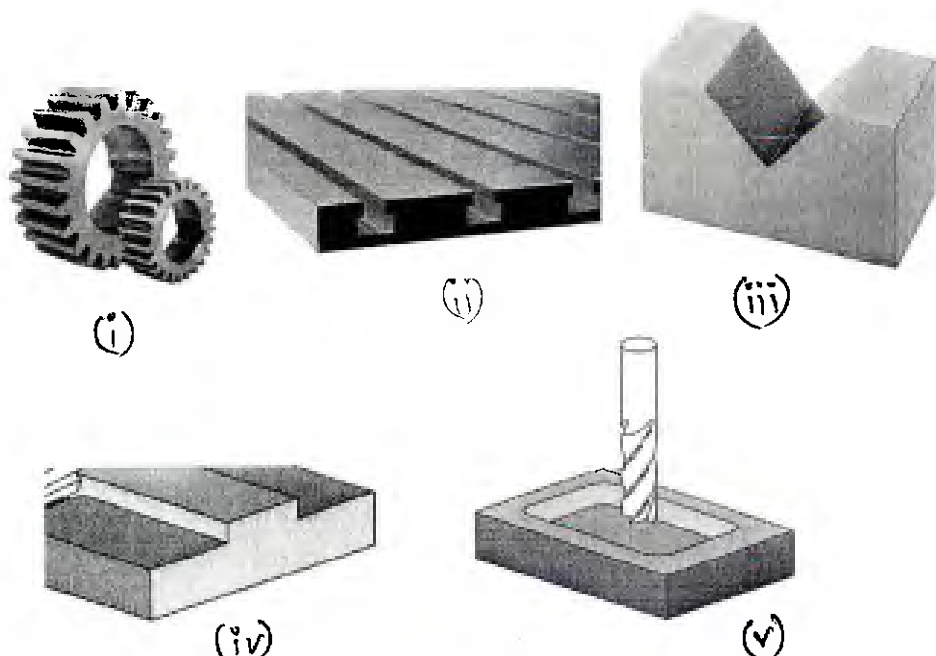


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**ENDSEM/RE-EXAMINATION MAY/JUNE 2026**

|        |                                                                                                                                                                                                                                                                                                        |    |    |        |    |
|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|--------|----|
| Q.2. d | Two thin metal plates are to be joined at the site and there is no electrical power source at the site. As an engineer determine which welding process can be selected so that it can be transported and used at site for welding as well as cutting of metals. Draw neat diagram of the same process. | 05 | 03 | 03, 05 | 02 |
| Q.3. a | Describe in short with diagram different types of resistance welding.                                                                                                                                                                                                                                  | 10 | 01 | 02     | 02 |
| Q.3. b | Figure shows a part drawing of the shaft to be made on Lathe machine.<br>i. List the names of operations to be carried out.<br>ii. Calculate the taper angle with respect to horizontal.<br>                         | 05 | 03 | 03, 05 | 03 |
| Q.3. c | A hole 40 mm deep with a 12 mm diameter is to be drilled with a cutting speed of 30 m/min, and a feed of 0.25 mm/rev. Find the spindle speed, feed rate and machining time required. Approach is 15 mm and overtravel is 5 mm.                                                                         | 05 | 04 | 03     | 03 |
| Q.4. a | For the given figures below, identify which milling process will be required to complete the part.<br>                                                                                                             | 05 | 03 | 05     | 03 |



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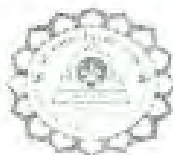
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**ENDSEM/RE-EXAMINATION MAY/JUNE 2026**

|        |                                                                                                                                                                                                                                                                                              |          |           |           |    |
|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-----------|-----------|----|
| Q.4. b | A 200 mm long, 35 mm diameter stainless steel rod is being reduced to 30 mm diameter in single pass turning on lathe. The spindle is rotating at 600 rpm. If the operation is to be completed in 5 mins. Calculate the Cutting speed, feed rate, material removal rate.                      | 05       | 04        | 03        | 03 |
| Q.4. c | List different Non-Conventional Machining Processes.<br>Explain any one with its advantages and disadvantages.                                                                                                                                                                               | 04<br>06 | 03,<br>02 | 01,<br>02 | 04 |
| Q.5. a | List and describe different work-holding devices with its applications?                                                                                                                                                                                                                      | 10       | 03        | 01,<br>03 | 04 |
| Q.5. b | Classify grinding machines and<br>describe in short atleast two types of each sub category.                                                                                                                                                                                                  | 04<br>06 | 02<br>01  | 02        | 05 |
| Q.6. a | List and describe different grinding wheel configurations with applications.                                                                                                                                                                                                                 | 10       | 03        | 01,<br>03 | 05 |
| Q.6. b | A beverage industry is finding tough to sustain with glass bottles and wants to reduce cost by switching over to plastic bottles. An engineer is to find the suitable manufacturing process for manufacturing the plastic bottles. Explain the stages of the process with diagram.           | 10       | 04        | 02,<br>05 | 01 |
| Q.7. a | A food industry requires stainless steel container to be made as shown in figure below. As an engineer suggest the appropriate manufacturing process. Explain the stages of the process with diagram.<br> | 10       | 04        | 02,<br>05 | 01 |
| Q.7. b | A start-up company has a new product idea and wants to make a prototype. Suggest any one rapid prototyping process and explain with diagram.                                                                                                                                                 | 10       | 04        | 02,<br>05 | 05 |

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End Semester Examination/ Re-Examination, May /June 2026



Max. Marks: 100marks

Class: (Mechanical)

Semester: II

Name of the Course: Engineering Chemistry

Duration: 180Min

Program: F.Y.B. Tech

Course Code : BS-BTM202

**Instructions:**

- 1 Read all instructions carefully before attempting the questions
- 2 Question No (Q6) is compulsory
- 3 Attempt any 4 from Q1, Q2, Q3, Q4, Q5
- 4 Write the chemical reactions wherever necessary
- 5 Prioritize questions that carry higher marks or require more detailed responses

| Que. No |                                                                                                                                                                                              | Max. Marks | Course Outcome Number | Mod. No. |
|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----------------------|----------|
| Q1      |                                                                                                                                                                                              |            |                       |          |
| a       | Explain the bi-metallic corrosion with suitable example                                                                                                                                      | 5          | 1                     | 1        |
| b       | Explain hydrogen evolution type of corrosion with suitable reactions                                                                                                                         | 5          | 1                     | 1        |
| c       | Describe dry corrosion in detail with suitable chemical reactions, mechanism, and nature of oxide film formed during corrosion                                                               | 10         | 1,3                   | 1        |
| Q2      |                                                                                                                                                                                              |            |                       |          |
| a       | Describe the different methods of corrosion prevention. Explain protection by proper design,                                                                                                 | 5          | 1                     | 2        |
| b       | Differentiate between anodic coating and cathodic coating with suitable examples                                                                                                             | 5          | 1,3                   | 2        |
| c       | Explain cathodic protection in detail. Describe sacrificial anodic protection and impressed current cathodic protection with neat diagrams, working principle, advantages, and applications. | 10         | 1,3                   | 2        |
| Q3      |                                                                                                                                                                                              |            |                       |          |
| a       | Define calorific value. Explain higher calorific value and lower calorific value with suitable examples                                                                                      | 5          | 4                     | 3        |
| b       | Write short note on cetane value of petrol fuel                                                                                                                                              | 5          | 2                     | 3        |
| c       | Explain the determination of carbon and hydrogen present in coal by using a combustion apparatus. Draw a neat labelled diagram of                                                            | 10         | 2,3                   | 3        |

|    |                                                                                                                                                                                                                                                                                                                      |    |     |   |
|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|-----|---|
|    | the combustion apparatus and explain its working principle. Write the chemical reactions involved and derive the formula used for calculating percentage of carbon and percentage of hydrogen.                                                                                                                       |    |     |   |
| Q4 |                                                                                                                                                                                                                                                                                                                      |    |     |   |
| a  | Explain flash point and fire point of lubricating oil                                                                                                                                                                                                                                                                | 5  | 2,3 | 4 |
| b  | Explain cloud point and pour point is important in lubricant selection and maintenance.                                                                                                                                                                                                                              | 5  | 4,3 | 4 |
| c  | Classify lubricants as solid, semi-solid, liquid, and gaseous lubricants. Give suitable examples such as graphite, grease, mineral oil, synthetic oil, and air lubricant with their applications                                                                                                                     | 10 | 4   | 4 |
| Q5 |                                                                                                                                                                                                                                                                                                                      |    |     |   |
| a  | Define electrochemical series and galvanic series. Explain the basis on which metals are arranged in both series.                                                                                                                                                                                                    | 5  | 1   | 1 |
| b  | Why is anodic coating considered better than cathodic coating? Explain with one suitable example.                                                                                                                                                                                                                    | 5  | 1,3 | 2 |
| c  | Define fuel and Explain the characteristics of a good fuel in detail                                                                                                                                                                                                                                                 | 10 | 2   | 3 |
| Q6 |                                                                                                                                                                                                                                                                                                                      |    |     |   |
| a  | A Coal sample contain following composition by weight C=80% H=10 %,O=4%, S=1%,N=2% and Ash=3% calculate gross and net calorific value                                                                                                                                                                                | 5  | 2   | 3 |
| b  | 3.0 gram of coal was heated in Kjeldahls flask and $\text{NH}_3$ evolved was absorbed in 50ml of 0.5N $\text{H}_2\text{SO}_4$ . After absorption, the excess of acid required 37 mL of 0.5N of KOH for neutralization. Find out the percentage of nitrogen content in a coal sample (value of blank titration =50mL) | 5  | 2   | 3 |
| c  | A 2.5 g coal sample is completely burnt in a combustion apparatus. The increase in weight of the KOH bulb is 4.65 g and the increase in weight of the calcium chloride tube is 0.97 g. Calculate the percentage of carbon and hydrogen in the coal sample.                                                           | 5  | 2   | 3 |
| d  | Calculate the acid value of lubricating oil if 4.5g of oil sample requires 3.6 ml of 0.05 N KOH solution for complete neutralization.                                                                                                                                                                                | 5  | 4   | 4 |



Bharatiya Vidya Bhavan's

# Sardar Patel College of Engineering

(A Government Aided Autonomous Institute)

Munshi Nagar, Andheri (West), Mumbai - 400058.

End Semester Examination/ ~~Re-Examination~~, May /June 2026



116126

Max. Marks: 50 marks

Class: (C/M/E)

Semester: II

Duration: 120Min

Program: F.Y.B. Tech (C/M/E)

Name of the Course: Indian traditional Knowledge

Course Code : IK-BTM201

**Instructions:**

- 1 Read all instructions carefully before attempting the questions
- 2 Justify your answers with examples where applicable
- 3 Prioritize questions that carry higher marks or require more detailed responses.
- 4 Avoid writing excessive content. Stick to the points and explanations relevant to the question
- 5 Attempt any four questions from Q1 to Q5, and any one question from Q6 or Q7.

| Question No |                                                                                                                                                                 | Max. Marks | Course Outcome Number | Module No. |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----------------------|------------|
| Q1          |                                                                                                                                                                 |            |                       |            |
| a           | Explain how geography, pilgrimage, and shared religious practices helped in maintaining Indian unity.                                                           | 5          | 1,2                   | 1          |
| b           | Write a short note on Mukarji's idea of Indian unity.                                                                                                           | 5          | 1                     | 1          |
| Q2          |                                                                                                                                                                 |            |                       |            |
| a           | Explain the challenges to unity in diversity in modern India.                                                                                                   | 5          | 2                     | 1          |
| b           | Discuss the need for human values in science and technology, with suitable examples.                                                                            | 5          | 2                     | 2          |
| Q3          |                                                                                                                                                                 | 5          |                       | 1          |
| a           | Explain the contribution of Nagarjuna in the field of ancient Indian chemistry and metallurgy                                                                   | 5          | 2                     | 3          |
| b           | Write a short note on the contribution of ancient Indian chemistry in metallurgy, perfumes, pigments, and medicine.                                             | 5          | 1,4                   | 3          |
| Q4          |                                                                                                                                                                 |            |                       |            |
| a           | Discuss how ancient Indian innovations in engineering, such as water management systems and architectural marvels, have influenced modern engineering practices | 5          | 1,4                   | 3          |

— 1 —

|    |   |                                                                                                                                                                                                          |    |     |   |
|----|---|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|-----|---|
|    | b | Explain how modern lifestyle changes such as sedentary work, stress, unhealthy eating habits, and lack of rest affect physical and mental health.                                                        | 5  | 1,4 | 4 |
| Q5 |   |                                                                                                                                                                                                          |    |     |   |
|    | a | Describe the main features of Ajanta Cave paintings.                                                                                                                                                     | 5  | 3   | 5 |
|    | b | Write a short note on ancient Indian architecture with examples such as Sanchi Stupa, Ajanta Caves, Ellora Caves, Khajuraho Temples, and Brihadeeswara Temple.                                           | 5  | 3   | 5 |
| Q6 |   |                                                                                                                                                                                                          |    |     |   |
|    | a | Compare the dance forms and music traditions of any two assigned states. Explain how these art forms reflect their cultural identity, folk traditions, and social life.                                  | 10 | 1,3 | 5 |
| Q7 |   |                                                                                                                                                                                                          |    |     |   |
|    | a | Prepare a detailed comparative study of two states from different regions of India based on language, food, dress, festivals, art forms, and architecture. Add suitable examples to support your answer. | 10 | 3,4 | 6 |



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## Sardar Patel College of Engineering

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Munshi Nagar, Andheri (West), Mumbai – 400058.

**End Semester Examination/ Re-Examination, May /June 2026**



**Max. Marks: 100marks**

**Class: (Mechanical)**

**Semester: II**

**Name of the Course: Engineering Chemistry**

**Duration: 180Min**

**Program: F.Y.B. Tech**

**Course Code : BS-BTM202**

**Instructions:**

- 1 Read all instructions carefully before attempting the questions
- 2 Question No (Q6) is compulsory
- 3 Attempt any 4 from Q1, Q2, Q3, Q4, Q5
- 4 Write the chemical reactions wherever necessary
- 5 Prioritize questions that carry higher marks or require more detailed responses

| Que. No |                                                                                                                                                                                                     | Max. Marks | Course Outcome Number | Mod. No. |
|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----------------------|----------|
| Q1      |                                                                                                                                                                                                     |            |                       |          |
| a       | Explain stress corrosion cracking with a suitable engineering example.                                                                                                                              | 5          | 1                     | 1        |
| b       | Explain oxygen absorption type of wet corrosion with suitable reaction                                                                                                                              | 5          | 1                     | 1        |
| c       | Describe wet corrosion with a suitable chemical reaction and a neat diagram. Also explain the mechanism involved in wet corrosion                                                                   | 10         | 1,3                   | 1        |
| Q2      |                                                                                                                                                                                                     |            |                       |          |
| a       | Explain how proper design helps in reducing corrosion in engineering components                                                                                                                     | 5          | 1                     | 2        |
| b       | What are corrosion inhibitors? Explain their role in corrosion prevention.                                                                                                                          | 5          | 1,3                   | 2        |
| c       | Explain non-metallic coatings used for corrosion prevention. Describe paints, varnishes, enamel coating, phosphate coating, and chromate coating with their composition, function, and applications | 10         | 1,3                   | 2        |
| Q3      |                                                                                                                                                                                                     |            |                       |          |
| a       | Differentiate between solid, liquid, and gaseous fuels with examples                                                                                                                                | 5          | 4                     | 3        |
| b       | Write short note on octane value of petrol fuel                                                                                                                                                     | 5          | 2                     | 3        |

|    |                                                                                                                                                                                                                                                                                                                     |    |     |   |
|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|-----|---|
| c  | Describe the ultimate analysis of coal with special reference to Kjeldahl's method.                                                                                                                                                                                                                                 | 10 | 2,3 | 3 |
| Q4 |                                                                                                                                                                                                                                                                                                                     |    |     |   |
| a  | Explain cloud point and pour point of lubricating oil                                                                                                                                                                                                                                                               | 5  | 2,3 | 4 |
| b  | Explain why acid value is important in lubricant selection and maintenance.                                                                                                                                                                                                                                         | 5  | 4,3 | 4 |
| c  | Classify lubricants as solid, semi-solid, liquid, and gaseous lubricants. Give suitable examples such as graphite, grease, mineral oil, synthetic oil, and air lubricant with their applications                                                                                                                    | 10 | 4   | 4 |
| Q5 |                                                                                                                                                                                                                                                                                                                     |    |     |   |
| a  | Describe how difference in oxygen concentration or ionic concentration on the same metal surface causes localized corrosion.                                                                                                                                                                                        | 5  | 1   | 5 |
| b  | Differentiate between anodic coating and cathodic coating with suitable examples.                                                                                                                                                                                                                                   | 5  | 1,3 | 5 |
| c  | Define cracking and explain thermal cracking and catalytic cracking. Also write the importance of cracking in increasing the yield and quality of petrol.                                                                                                                                                           | 10 | 2   |   |
| Q6 |                                                                                                                                                                                                                                                                                                                     |    |     |   |
| a  | A Coal sample contain following composition by weight C=86% H=4%, O=4%, S=1%, N=3% and Ash=2% calculate gross and net calorific value                                                                                                                                                                               | 5  | 2   | 3 |
| b  | 5.0 gram of coal was heated in Kjeldahls flask and $\text{NH}_3$ evolved was absorbed in 50ml of 0.5N $\text{H}_2\text{SO}_4$ . After absorption, the excess of acid required 40mL of 0.5N of KOH for neutralization. Find out the percentage of nitrogen content in a coal sample (value of blank titration =50mL) | 5  | 2   | 3 |
| c  | A 1.5 g coal sample is completely burnt in a combustion apparatus. The increase in weight of the KOH bulb is 3.85 g and the increase in weight of the calcium chloride tube is 0.90 g. Calculate the percentage of carbon and hydrogen in the coal sample.                                                          | 5  | 2   |   |
| d  | Calculate the acid value of lubricating oil if 4 g of oil sample requires 3ml of 0.05 N KOH solution for complete neutralization.                                                                                                                                                                                   | 5  | 4   | 4 |



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~~End Semester Examination/~~ Re-Examination, May /June 2026



Max. Marks: 100

Class: F.Y. BTech

Semester: II

Duration: 3Hr

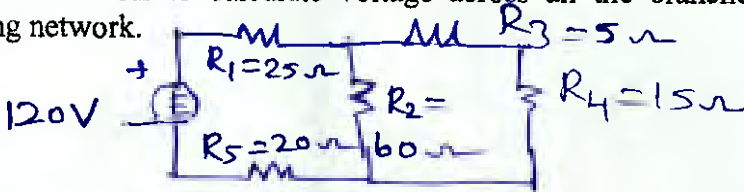
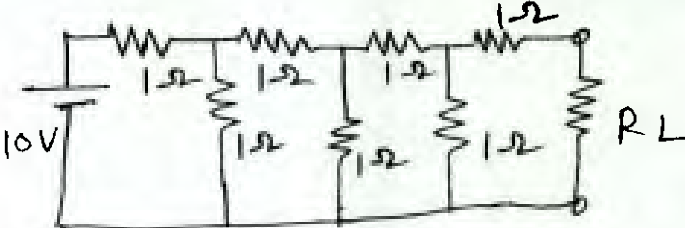
Program: BTech Mechanical

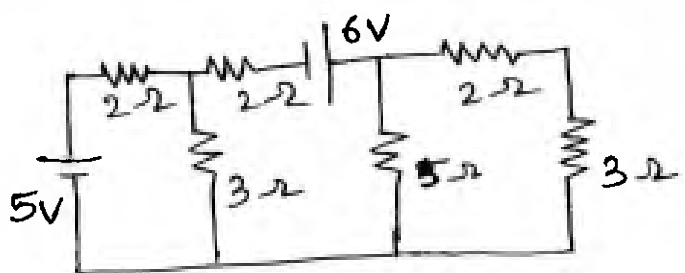
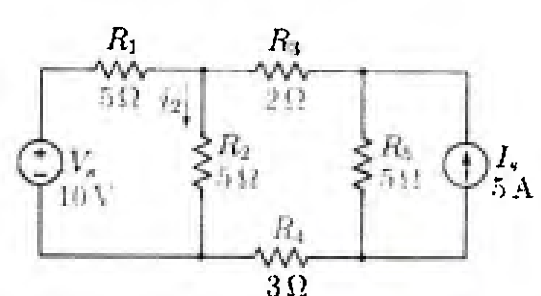
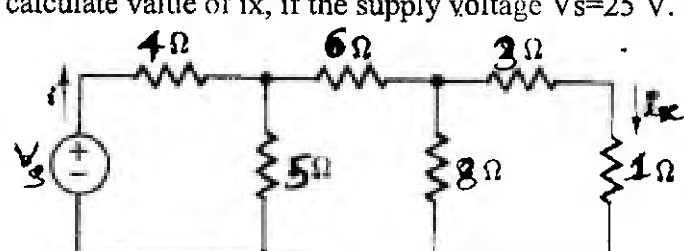
Name of the Course: Basic Electrical and Electronics Engg.

Course Code : ES-BTM201

**Instructions:**

- 1) Question No 1 is compulsory. Solve any four from questions 2 to 7.
- 2) In the absence of any data, make suitable assumptions and justify the same.
- 3) Answer to a question should be grouped together.

| Q. No | Question                                                                                                                                                                                                                                         | Max. Marks | Course Outcome | Mod No. |
|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|----------------|---------|
| Q1a   | List any five sensor characteristic and describe them in short.                                                                                                                                                                                  | 05         | 04             | 05      |
| Q1b   | Use KVL or KCL to calculate voltage across all the branches of following network.<br>                                                                         | 05         | 02             | 03      |
| Q1c   | Explain operation of a BJT as a switch.                                                                                                                                                                                                          | 05         | 03             | 04      |
| Q1d   | Consider a series RL circuit excited by a single phase AC. Draw phasor diagram and derive expression for current, impedance and power in the circuit.                                                                                            | 05         | 01             | 02      |
| Q2a   | A resistor of $100\Omega$ is connected in series with a $100\mu\text{f}$ capacitor. This circuit is connected to a 220V, 60Hz supply. Determine a) impedance b) current c) power factor e) voltage across resistor and voltage across capacitor. | 10         | 01             | 02      |
| Q2b   | Determine the expression for current $i(t)$ in sinusoidal form, and calculate real, reactive and apparent power when a voltage $\theta(t)=120\text{V}$ , 50 Hz is applied to a coil having $R=5\Omega$ and inductance $L=0.01\text{H}$ .         | 10         | 01             | 02      |
| Q3a   | Calculate voltage, power consumption and current through the load resistance $R_L$ when its value is adjusted for maximum power transfer.<br>                 | 10         | 01             | 01      |

|     |                                                                                                                                                                                                                                                                                                                   |    |    |    |
|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|
| Q3b | <p>Using superposition theorem, determine current through <math>5\Omega</math>.</p>                                                                                                                                             | 10 | 01 | 01 |
| Q4a | <p>Consider a network given below. Determine current through <math>3\Omega</math> resistor. Also power supplied by both the sources.</p>                                                                                         | 10 | 01 | 01 |
| Q4b | <p>Obtain Norton's equivalent circuit across <math>1\Omega</math> resistor. Hence calculate value of <math>i_x</math>, if the supply voltage <math>V_s=25\text{ V}</math>.</p>                                                  | 10 | 01 | 01 |
| Q5b | Derive the relation for power in three phase balanced system.                                                                                                                                                                                                                                                     | 05 | 01 | 02 |
| Q5b | Derive the relation between line and phase quantities for a delta connected three phase load. Draw the phasor diagram (only current phasors). A balanced delta-connected load has an impedance of $(10 + j6)\Omega$ per phase and is connected to a 400 V, 3-phase supply. Determine the line and phase currents. | 10 | 01 |    |
| Q5c | Explain working principle of three phase induction motor.                                                                                                                                                                                                                                                         | 05 | 02 | 03 |
| Q6a | Explain working principle and characteristics of a n-p-n transistor. Explain common emitter configuration.                                                                                                                                                                                                        | 10 | 03 | 04 |
| Q6b | Explain working principle of full wave rectifier with neat diagram and waveforms.                                                                                                                                                                                                                                 | 10 | 03 | 04 |
| Q7b | Explain working principle of a transformer. List different types of transformer and explain in detail.                                                                                                                                                                                                            | 10 | 02 | 03 |
| Q7b | List different classifications of sensors. Describe working principle of any two sensors.                                                                                                                                                                                                                         | 10 | 04 | 05 |



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**ENDSEM/RE-EXAMINATION MAY/JUNE 2026**

Program: B.Tech. in Mechanical Engineering

Duration: 3 hrs.

Course Code: PC-BTM201

Maximum Points: 100

Course Name: Manufacturing Processes

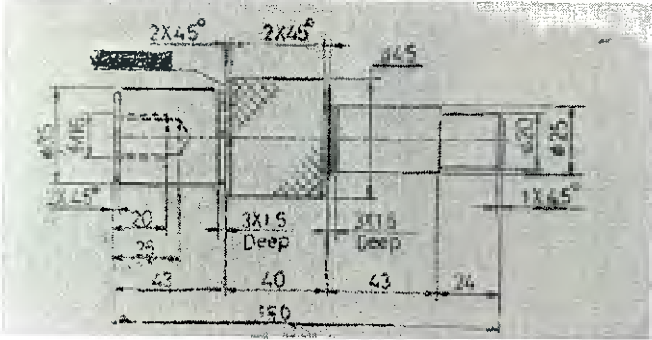
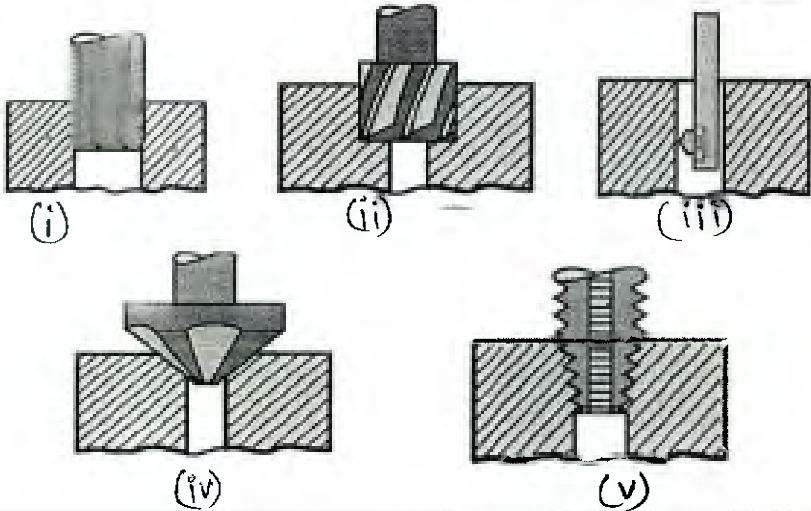
Semester: II

**Notes:**

1. Question 1 is compulsory.
2. Attempt **any 4** questions from Q2 to Q7.
3. Answer to sub questions should be strictly grouped together.
4. Answers should be clearly readable. Avoid scribbling.
5. Draw neat labelled diagram wherever necessary.
6. Assume suitable data only if necessary.

| Q. No. | Questions                                                                                                                                                                                                                                                                                                                                                                                                                                       | Points | CO                         | BL                         | Module No.                 |
|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|----------------------------|----------------------------|----------------------------|
| Q.1.   | Attempt <b>any four</b> : (05 points each)<br>a. List the stages of investment casting process in order of operations.<br>b. Describe Gas Metal Arc welding with a neat sketch diagram.<br>c. Draw a neat sketch of Single point cutting tool for lathe machine showing all the principle tool angles.<br>d. Describe in short NC and CNC machines.<br>e. List and describe different types of abrasives used for the surface grinding process. | 20     | 01<br>01<br>01<br>02<br>02 | 02<br>02<br>03<br>02<br>02 | 01<br>02<br>03<br>04<br>05 |
| Q.2. a | List the casting defects with their standardized letters.                                                                                                                                                                                                                                                                                                                                                                                       | 05     | 02                         | 01                         | 01                         |
| Q.2 b  | Explain any three casting defects with neat sketch.                                                                                                                                                                                                                                                                                                                                                                                             | 05     | 01                         | 02                         | 01                         |
| Q.2. c | Classify Metal joining processes.                                                                                                                                                                                                                                                                                                                                                                                                               | 05     | 02                         | 01                         | 02                         |
| Q.2. d | A pharma company requires stainless steel pipes to be welded. The weld should be of surgical quality and no spatter of slag. Identify the correct welding process and draw its neat labeled diagram.                                                                                                                                                                                                                                            | 05     | 03                         | 03,<br>05                  | 02                         |
| Q.3. a | Describe working of resistance welding with applications and advantages and disadvantages.                                                                                                                                                                                                                                                                                                                                                      | 10     | 01                         | 02                         | 02                         |

**ENDSEM/RE-EXAMINATION MAY/JUNE 2026**

|        |                                                                                                                                                                                                                                                                         |          |           |           |    |
|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-----------|-----------|----|
| Q.3. b | Figure shows a part drawing of the shaft to be made on Lathe machine.<br>List the names of operations to be carried out.<br>                                                          | 05       | 03        | 03, 05    | 03 |
| Q.3. c | A hole 25 mm deep with a 12 mm diameter is to be drilled with a cutting speed of 30 m/min, and a feed of 0.35 mm/rev. Find the spindle speed, feed rate and machining time required. Approach is 15 mm and overtravel is 5 mm.                                          | 05       | 04        | 03        | 03 |
| Q.4. a | Identify different drilling operations from the figures given below:<br>                                                                                                            | 05       | 03        | 05        | 03 |
| Q.4. b | A 200 mm long, 50 mm diameter stainless steel rod is being reduced to 45 mm diameter in single pass turning on lathe. The spindle is rotating at 600 rpm. If the operation is to be completed in 4 mins. Calculate the cutting speed, feed rate, material removal rate. | 05       | 04        | 03        | 03 |
| Q.4. c | List different Non-Conventional Machining Processes.<br>Explain any one with its advantages and disadvantages.                                                                                                                                                          | 04<br>06 | 03,<br>02 | 01,<br>02 | 04 |
| Q.5. a | List and describe different types of chucks (holding device) with its applications?                                                                                                                                                                                     | 10       | 03        | 01,<br>03 | 04 |
| Q.5. b | Give primary reasons for surface treatment.<br>What are common surface treatment methods.                                                                                                                                                                               | 06<br>04 | 02<br>01  | 02        | 05 |



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**ENDSEM/RE-EXAMINATION MAY/JUNE 2026**

|        |                                                                                                                                                                                                                                                                                                 |    |    |        |    |
|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|--------|----|
|        |                                                                                                                                                                                                                                                                                                 |    |    |        |    |
| Q.6. a | List and describe different grinding wheel configurations with applications.                                                                                                                                                                                                                    | 10 | 03 | 01, 03 | 05 |
| Q.6. b | A company has received an order from railways to supply 10 tons of steel rails (I-Beam section). Suggest a suitable manufacturing process. Explain the stages of the process with diagram.                                                                                                      | 10 | 04 | 02, 05 | 01 |
|        |                                                                                                                                                                                                                                                                                                 |    |    |        |    |
| Q.7. a | A complex metal part requires multiple operations to be done and is to be produced in mass. The conventional machines like lathe and milling requires lot of production time. Suggest the automated machine and explain its process.<br>What are key characteristics of such machining centres. | 10 | 04 | 02, 05 | 05 |
| Q.7. b | A start-up company has a new product idea and wants to make a prototype. Suggest any one rapid prototyping process and explain with diagram.                                                                                                                                                    | 10 | 04 | 02, 05 | 05 |

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**ENDSEM/RE-EXAMINATION MAY/JUNE 2026****Program: B.Tech. in Mechanical Engineering****Duration: 3 hrs.****Course Code: PC-BTM201****Maximum Points: 100****Course Name: Manufacturing Processes****Semester: II****Notes:**

1. Question 1 is compulsory.
2. Attempt **any 4** questions from Q2 to Q7.
3. Answer to sub questions should be strictly grouped together.
4. Answers should be clearly readable. Avoid scribbling.
5. Draw neat labelled diagram wherever necessary.
6. Assume suitable data only if necessary.

| Q. No. | Questions                                                                                                                                                                                            | Points | CO | BL     | Module No. |
|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|----|--------|------------|
| Q.1.   | Attempt <b>any four</b> : (05 points each)                                                                                                                                                           | 20     |    |        |            |
|        | a. List the stages of investment casting process in order of operations.                                                                                                                             |        | 01 | 02     | 01         |
|        | b. Describe Gas Metal Arc welding with a neat sketch diagram.                                                                                                                                        |        | 01 | 02     | 02         |
|        | c. Draw a neat sketch of Single point cutting tool for lathe machine showing all the principle tool angles.                                                                                          |        | 01 | 03     | 03         |
|        | d. Describe in short NC and CNC machines.                                                                                                                                                            |        | 02 | 02     | 04         |
|        | e. List and describe different types of abrasives used for the surface grinding process.                                                                                                             |        | 02 | 02     | 05         |
| Q.2. a | List the casting defects with their standardized letters.                                                                                                                                            | 05     | 02 | 01     | 01         |
| Q.2 b  | Explain any three casting defects with neat sketch.                                                                                                                                                  | 05     | 01 | 02     | 01         |
| Q.2. c | Classify Metal joining processes.                                                                                                                                                                    | 05     | 02 | 01     | 02         |
| Q.2. d | A pharma company requires stainless steel pipes to be welded. The weld should be of surgical quality and no spatter of slag. Identify the correct welding process and draw its neat labeled diagram. | 05     | 03 | 03, 05 | 02         |
| Q.3. a | Describe working of resistance welding with applications and advantages and disadvantages.                                                                                                           | 10     | 01 | 02     | 02         |

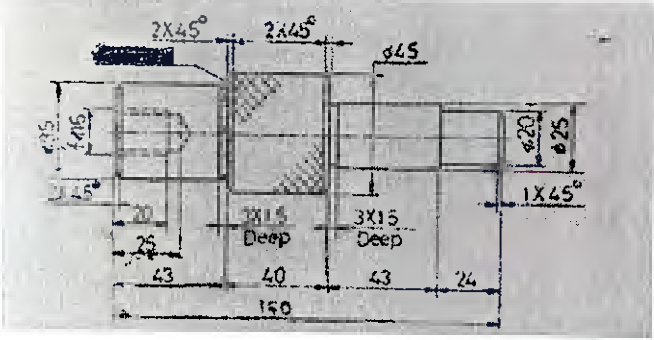
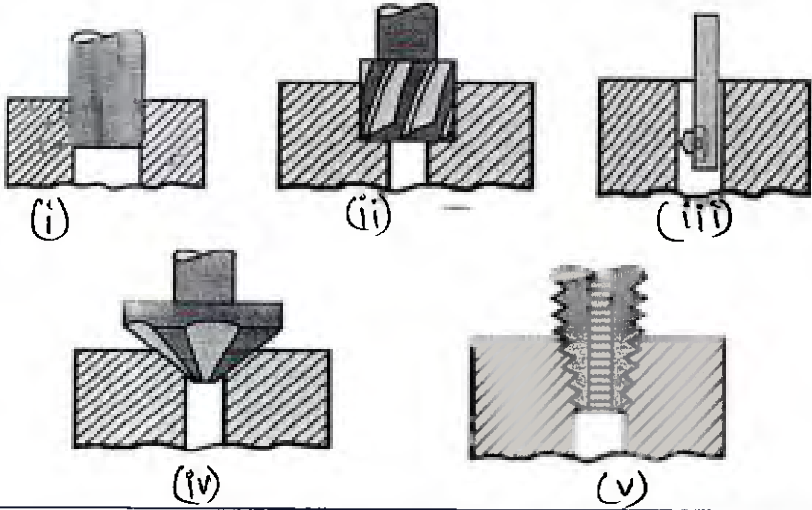


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**ENDSEM/RE-EXAMINATION MAY/JUNE 2026**

|                                                                                      |                                                                                                                                                                                                                                                                         |          |           |           |    |
|--------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-----------|-----------|----|
| Q.3. b                                                                               | Figure shows a part drawing of the shaft to be made on Lathe machine.<br>List the names of operations to be carried out.                                                                                                                                                | 05       | 03        | 03, 05    | 03 |
|    |                                                                                                                                                                                                                                                                         |          |           |           |    |
| Q.3. c                                                                               | A hole 25 mm deep with a 12 mm diameter is to be drilled with a cutting speed of 30 m/min, and a feed of 0.35 mm/rev. Find the spindle speed, feed rate and machining time required. Approach is 15 mm and overtravel is 5 mm.                                          | 05       | 04        | 03        | 03 |
| Q.4. a                                                                               | Identify different drilling operations from the figures given below:                                                                                                                                                                                                    | 05       | 03        | 05        | 03 |
|  |                                                                                                                                                                                                                                                                         |          |           |           |    |
| Q.4. b                                                                               | A 200 mm long, 50 mm diameter stainless steel rod is being reduced to 45 mm diameter in single pass turning on lathe. The spindle is rotating at 600 rpm. If the operation is to be completed in 4 mins. Calculate the cutting speed, feed rate, material removal rate. | 05       | 04        | 03        | 03 |
| Q.4. c                                                                               | List different Non-Conventional Machining Processes.<br>Explain any one with its advantages and disadvantages.                                                                                                                                                          | 04<br>06 | 03,<br>02 | 01,<br>02 | 04 |
| Q.5. a                                                                               | List and describe different types of chucks (holding device) with its applications?                                                                                                                                                                                     | 10       | 03        | 01,<br>03 | 04 |
| Q.5. b                                                                               | Give primary reasons for surface treatment.<br>What are common surface treatment methods.                                                                                                                                                                               | 06<br>04 | 02<br>01  | 02        | 05 |



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# SARDAR PATEL COLLEGE OF ENGINEERING

(Government Aided Autonomous Institute)

Munshi Nagar, Andheri (W) Mumbai – 400058



## ENDSEM/RE-EXAMINATION MAY/JUNE 2026

|        |                                                                                                                                                                                                                                                                                                 |    |    |        |    |
|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|--------|----|
|        |                                                                                                                                                                                                                                                                                                 |    |    |        |    |
| Q.6. a | List and describe different grinding wheel configurations with applications.                                                                                                                                                                                                                    | 10 | 03 | 01, 03 | 05 |
| Q.6. b | A company has received an order from railways to supply 10 tons of steel rails (I-Beam section). Suggest a suitable manufacturing process. Explain the stages of the process with diagram.                                                                                                      | 10 | 04 | 02, 05 | 01 |
|        |                                                                                                                                                                                                                                                                                                 |    |    |        |    |
| Q.7. a | A complex metal part requires multiple operations to be done and is to be produced in mass. The conventional machines like lathe and milling requires lot of production time. Suggest the automated machine and explain its process.<br>What are key characteristics of such machining centres. | 10 | 04 | 02, 05 | 05 |
| Q.7. b | A start-up company has a new product idea and wants to make a prototype. Suggest any one rapid prototyping process and explain with diagram.                                                                                                                                                    | 10 | 04 | 02, 05 | 05 |

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