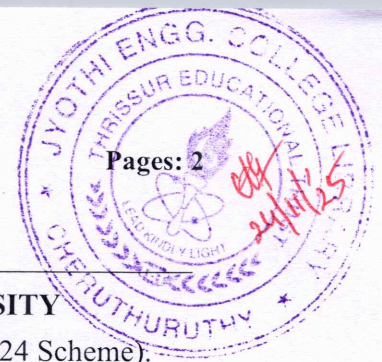


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06PBMET304112501



Reg No.: \_\_\_\_\_

Name: \_\_\_\_\_

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**

B.Tech Degree S3 (R) (FT/WP) Examination November 2025 (2024 Scheme).

**Course Code: PBMET304**

**Course Name: MANUFACTURING PROCESSES**

Max. Marks: 40

Duration: 2 hours 30 minutes

**PART A**

*(Answer all questions. Each question carries 2 marks)*

CO Marks

- |   |   |     |     |
|---|---|-----|-----|
| 1 | Discuss the characteristic of moulding sand used for sand casting.                    | CO1 | (2) |
| 2 | Compare sand casting and die casting process  | CO1 | (2) |
| 3 | Explain the effect of porosity on the mechanical properties of weld                   | CO2 | (2) |
| 4 | State the function of tungsten electrode in TIG welding                               | CO2 | (2) |
| 5 | Differentiate hot rolling with cold rolling   | CO3 | (2) |
| 6 | Mention two defects commonly found rolled products.                                   | CO3 | (2) |
| 7 | Discuss the importance of grain flow in forged components and its effect on strength. | CO4 | (2) |
| 8 | Define springback as observed in sheet metal forming operation.                       | CO4 | (2) |

**PART B**

*(Answer any one full question from each module, each question carries 6 marks)*

**Module -1**

- |   |   |     |     |
|---|---|-----|-----|
| 9 | a) With sketches discuss the various types of defects generated during the casting process. | CO1 | (4) |
|   | b) Explain precision investment casting   | CO1 | (2) |



- 10 a) A steel casting of volume  $700 \text{ cm}^3$  and surface area  $500 \text{ cm}^2$  is poured in a sand mold. If the mold constant is  $4 \text{ min/cm}^2$ , calculate the solidification time using Chvorinov's rule. Compare it with another casting of the same volume but surface area of  $500 \text{ cm}^2$ . CO1 (3)
- b) Discuss the mechanisms of sintering and the influence of process parameters. CO1 (3)

### Module -2

- 11 a) Describe oxyacetylene gas welding process and explain various types of flames and its applications. CO2 (4)
- b) Explain Thermit welding. CO2 (2)
- 12 a) Compare brazing, soldering and adhesive bonding. CO2 (3)
- b) Discuss the effects of heat affected zone in welding. CO2 (3)

### Module -3

- 13 a) Explain different types of rolling mills used in metal forming operations with neat sketches. CO3 (4)
- b) State the difference between blanking and punching CO3 (2)
- 14 a) Describe the sequence of operations involved in ring rolling process with a neat sketch. CO3 (3)
- b)  $\mu > \tan \alpha$  where  $\mu$  = coefficient of friction and  $\alpha$  = angle of bite or angle of contact. From the above statement write down the roll bite condition in rolling CO3 (3)

### Module -4

- 15 a) Compare direct and indirect extrusion processes on the basis of their working principles, advantages and limitations. CO4 (4)
- b) Explain the terms bend allowance and bend deduction. CO4 (2)
- 16 a) Explain deep drawing process. CO4 (3)
- b) Differentiate between open die forging and closed die forging CO4 (3)

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