



**NATIONAL INSTITUTE OF TECHNICAL TEACHERS
TRAINING AND RESEARCH**
(DEEMED TO BE UNIVERSITY UNDER DISTINCT CATEGORY)
CHANDIGARH

Ph.D. Entrance Examination 2024

Subject / Branch / Department :	MECHANICAL ENGINEERING
Roll No. :	
Candidate Name :	
Date of Examination :	

Maximum Marks: 25 (There is no negative marking)

- Notes:** (a) Only one option to be tick-marked out of the four options given as answer
 (b) The Candidate must put his/her signature with date at the bottom of each page
 (c) For any rough work, please use ONLY back-sides of pages which are left blank

Q1. Which of the following pair has the same units?

- (a) Force and power
 (b) Energy and work
 (c) Momentum and energy
 (d) Impulse and momentum

Q 2. Dimensional formula for Young's modulus of elasticity is

- (a) $ML^{-1}T^{-2}$
 (b) MLT^{-2}
 (c) $M^{-1}L^{-1}T^{-1}$
 (d) $ML^{-2}T^{-2}$

Q 3. Which of the following materials has the highest value of Poisson's ratio

- (a) Steel
 (b) Copper
 (c) Wood
 (d) Rubber

Q 4. Stiffness of material is expressed in terms of

- (a) Mass density
 (b) Hardness number
 (c) Modulus of elasticity
 (d) Impact strength

- Q 5. In a composite system subjected to temperature rise and with ends constrained to remain together, the component having lower value of coefficient of linear expansion will experience a
- (a) Tensile stress
 - (b) Compressive stress
 - (c) Torsional stress
 - (d) Zero stress
- Q 6. The strain energy stored in a body due to external loading, within the elastic limit, is known as
- (a) Malleability
 - (b) Ductility
 - (c) Toughness
 - (d) Resilience
- Q 7. Which of the following material has highest ductility
- (a) Lead
 - (b) Gold
 - (c) Copper
 - (d) Tin
- Q 8. Weldability is poorest in case of
- (a) Wrought iron
 - (b) Low carbon steel
 - (c) High carbon steel
 - (d) Plain carbon steel
- Q 9. The chisel used for cutting steel sheets is usually
- (a) Hardened
 - (b) Annealed
 - (c) Hardened and tempered
 - (d) Annealed and tempered
- Q 10. Addition of sulphur to steel increases its
- (a) Hardness
 - (b) Corrosion resistance
 - (c) Wear resistance
 - (d) Machineability

Q 11. Which of the following alloy is used for manufacturing food-processing machinery

- (a) Monel metal
- (b) Alnico
- (c) Inconel
- (d) Pewter

Q 12. A key connecting a flange coupling to a shaft is likely to fail in

- (a) Shear
- (b) Tension
- (c) Torsion
- (d) Bending

Q 13. The bearing pressure is exerted at right angles to the shaft axis in a

- (a) Foot step bearing
- (b) Collar bearing
- (c) Radial bearing
- (d) Taper roller bearing

Q 14. The internal energy of a perfect gas does not change during

- (a) Adiabatic process
- (b) Isobaric process
- (c) Isothermal process
- (d) Isochoric process

Q 15. Poise is the unit of

- (a) Density
- (b) Velocity gradient
- (c) Kinematic viscosity
- (d) Dynamic viscosity

Q 16. In a laminar flow through a circular pipe, the discharge varies

- (a) Linearly with fluid density
- (b) Inversely with pressure drop
- (c) Directly as square of pipe radius
- (d) Inversely with fluid viscosity

Q 17. Cold working of the metals is carried out

- (a) Below the recrystallisation temperature
- (b) At the recrystallisation temperature
- (c) Above the recrystallisation temperature
- (d) Working temperature depends upon the physical conditions of the workpiece

Q 18. Chills are used in casting moulds to

- (a) Achieve directional solidification
- (b) Reduce possibility of blow holes
- (c) Reduce the freezing line
- (d) Increase the smoothness of cast surface

Q 19. Misrun is a casting defect which occurs due to

- (a) Very high pouring temperature of metal
- (b) Insufficient fluidity of the molten metal
- (c) Absorption of gases by the liquid metal
- (d) Improper alignment of the moulds

Q 20. Spot welding, projection welding and seam welding belong to the category to

- (a) Arc welding
- (b) Thermit welding
- (c) Forge welding
- (d) Electric resistance welding

Q 21. The welding process using flux in the form of granules is

- (a) Gas welding
- (b) DC arc welding
- (c) Submerged arc welding
- (d) Plasma arc welding

Q 22. The presence of residual flux after the welding operation leads to

- (a) Porosity
- (b) Corrosion
- (c) Crack formation
- (d) Embrittlement

Q 23. In orthogonal cutting, the angle at which the cutting face is inclined to the direction of cut is

- (a) 90 degree
- (b) Less than 90 degree
- (c) Between 30 and 45 degrees
- (d) Greater than 90 degree

Q 24. In a single point turning operation with cemented carbide and steel combination, Taylor exponent is 0.25. If the cutting speed is halved, the tool life will become

- (a) half
- (b) Double
- (c) Four times
- (d) Sixteen times

Q 25. The design of cutting tools is based on

- (a) Tensile strength
- (b) Rigidity
- (c) Compactness
- (d) Bending stress

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