

Answer Key Mechanical

Q 1.	a
Q 2.	a
Q 3.	b
Q 4.	c
Q 5.	b
Q 6.	a
Q 7.	d
Q 8.	c
Q 9.	a
Q 10.	a
Q 11.	b
Q 12.	d
Q 13.	c
Q 14.	d
Q 15.	c
Q 16.	c
Q 17.	c
Q 18.	b
Q 19.	b
Q 20.	d
Q 21.	b
Q 22.	d
Q 23.	b
Q 24.	b
Q 25.	b
Q 26.	c
Q 27.	c
Q 28.	c
Q 29.	d
Q 30.	a
Q 31.	a
Q 32.	a
Q 33.	c
Q 34.	b
Q 35.	a
Q 36.	a
Q 37.	c
Q 38.	c
Q 39.	c
Q 40.	d

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BATHINDA

Ph.D. Entrance Examination of Mechanical Engineering (ME)

- Q 1. Given the equations are $4x+2y+z=8$, $x+y+z=3$, $3x+y+3z=9$. Find the values of x , y and z .
- $5/3, 0, 2/3$
 - $1, 2, 3$
 - $4/3, 1/3, 5/3$
 - $2, 3, 4$
- Q 2. Find the rank of the matrix $A = \begin{bmatrix} 1 & 3 & 5 \\ 4 & 6 & 7 \\ 1 & 2 & 2 \end{bmatrix}$
- 3
 - 2
 - 1
 - 0
- Q 3. The volume of the region common to the interiors of two infinitely long cylinder defined by $x^2 + y^2 = 25$ and $x^2 + 4z^2 = 25$ is best approximated by:
- 225
 - 333
 - 423
 - 625
- Q 4. The value of $\lim_{x \rightarrow 0} (x \sin \frac{1}{x})$ is:
- ∞
 - 1
 - 0
 - 1
- Q 5. What is the order of the differential equation given by $\frac{dy}{dx} + 4y = \sin x$?
- 0.5
 - 1
 - 2
 - 0
- Q 6. A racer accelerates from a stop so that its speed is $10t$ m/s t second after starting how far will the car go in 4 seconds?
- 80 m
 - 60 m
 - 40 m
 - 160 m
- Q 7. For all complex numbers z satisfying $\text{Im}(z) \neq 0$, if $f(z) = z^2 + z + 1$ is a real valued function, then find its range.
- $(-\infty, -1]$
 - $(-\infty, 1/3)$
 - $(-\infty, 1/2]$
 - $(-\infty, 3/4)$

- Q 8. Find the range of the function defined by $f(z) = \operatorname{Re}[2iz/(1-z^2)]$.
- $(-\infty, 0) \cup (0, \infty)$
 - $[2, \infty)$
 - $(-\infty, -1] \cup [1, \infty)$
 - $(-\infty, 0] \cup [2, \infty)$
- Q 9. If the assumed hypothesis is tested for rejection considering it to be true is called?
- Null Hypothesis
 - Statistical Hypothesis
 - Simple Hypothesis
 - Composite Hypothesis
- Q 10. A and B are two events such that $P(\bar{A}) = 0.4$ and $P(A \cap B) = 0.2$ Then $P(A \cap \bar{B})$ is equal to _____
- 0.4
 - 0.2
 - 0.6
 - 0.8
- Q 11. Which of the following is an iterative method?
- Gauss Seidel
 - Gauss Jordan
 - Factorization
 - Gauss Elimination
- Q 12. Which of the following is termed as an action of pull or push of a body at rest or motion?
- Torque
 - Momentum
 - Work
 - Force
- Q 13. Which of the following doesn't affect frictional force?
- Surface roughness
 - Reaction of surface
 - Area of contact
 - Force tending cause motion
- Q 14. The change in the moment is equal to which of the following?
- Rotational moment
 - Bending moment
 - Total weight
 - Area under the shear diagram
- Q 15. What is the factor of safety?
- The ratio of stress to strain
 - The ratio of permissible stress to the ultimate stress
 - The ratio of ultimate stress to the permissible stress
 - The ratio of longitudinal strain to stress
- Q 16. Determine the shear stress at the level of neutral axis, if a beam has a triangle cross section having base "b" and altitude "h". Let the shear force be subjected is F.
- $3F/8bh$
 - $4F/3bh$
 - $8F/3bh$
 - $3F/6bh$

- Q 17. If the shortest link is fixed, what type of mechanism is obtained?
- Crank rocker mechanism
 - Linkage is not planar
 - Double crank mechanism
 - Double rocker mechanism
- Q 18. In a four stroke I.C. engine, the turning moment during the compression stroke is
- positive throughout
 - negative throughout
 - positive during major portion of the stroke
 - negative during major portion of the stroke
- Q 19. Longitudinal vibrations are said to occur when the particles of a body moves
- perpendicular to its axis
 - parallel to its axis
 - in a circle about its axis
 - none of the mentioned
- Q 20. The ratio of the maximum displacement of the forced vibration to the deflection due to the static force, is known as
- damping factor
 - damping coefficient
 - logarithmic decrement
 - magnification factor
- Q 21. Which of the following joins two rotating shafts to each other?
- Key
 - Coupling
 - Gear
 - Belt drive
- Q 22. Which of the following is not the cause of stress concentration?
- Abrupt changes in cross-section
 - Discontinuity in the component
 - Machining scratches
 - Point load applied on the component
- Q 23. When is a fluid called turbulent?
- High viscosity of fluid
 - Reynolds number is greater than 2000
 - Reynolds number is less than 2000
 - The density of the fluid is low
- Q 24. When the body is completely or partially immersed in a fluid, how much its weight be distributed for it to be in stable equilibrium.
- Is independent of weight distribution
 - Around the lower part
 - Around the upper part
 - None of the mentioned
- Q 25. Which way is heat transfer believed to take place in a long, hollow cylinder that is kept at consistent but varied temperatures on its inner and outer surfaces?
- Unpredictable
 - Radial only
 - No heat transfer takes place
 - Axial only

- Q 26. Why fins are provided on a heat transfer surface?
a) Pressure drop of the fluid should be minimized
b) Increase turbulence in flow for enhancing heat transfer
c) Surface area is maximum to promote the rate of heat transfer
d) Increase temperature gradient so as to enhance heat transfer
- Q 27. In which of the following systems does mass transfer occur across the system boundary?
a) isolated system
b) closed system
c) open system
d) none of the mentioned
- Q 28. The entropy of any closed system can increase in which of the following way?
a) dissipative effects or internal irreversibility
b) by heat interaction in which there is entropy transfer
c) both of the mentioned
d) none of the mentioned
- Q 29. Which of the following contributes to the improvement of efficiency of Rankine cycle in a Thermal Power Plant?
a) use of high pressures
b) reheating of steam at intermediate stage
c) regeneration use of steam for heating Boiler feed water
d) all of the mentioned
- Q 30. In which turbine the pressure energy of water is first converted into kinetic energy by means of nozzle kept close to the runner?
a) Impulse turbine
b) Reaction turbine
c) Both Impulse and Reaction turbine
d) None of the mentioned
- Q 31. How does the Vicker's hardness test differ from Brinell's?
a) Type of indenter
b) Materials to be tested
c) Load applied
d) Duration of indentation
- Q 32. The centrifugal casting method, is used for casting articles of _____
a) symmetrical shape about horizontal axis
b) symmetrical shape about vertical axis
c) irregular shape
d) sphere shape
- Q 33. Which of the following components is mainly manufactured by performing metal forging?
a) Piston
b) Engine block
c) Connecting rod
d) Crankcase
- Q 34. As compared to the arc welding, the gas welding takes
a) considerably less time for the metal to heat up
b) considerably more time for the metal to heat up
c) approximately same time for the metal to heat up as arc welding
d) unpredictable

- Q 35. Which of the following is not grouped under the surface finishing process?
- a) sawing
 - b) tapping
 - c) buffing
 - d) polishing
- Q 36. What are the functional dimensions?
- a) Have to be machined and fit with other mating components
 - b) Which have no effect on the performance of quality
 - c) Need not to be machined to an accuracy of the high degree
 - d) Function is more important than accuracy
- Q 37. In a CNC program block, N002 G02 G91 X40 Z40....., G02 and G91 refer to
- a) circular interpolation in counter clockwise direction and incremental dimension
 - b) circular interpolation in counter clockwise direction and absolute dimension
 - c) circular interpolation in clockwise direction and incremental dimension
 - d) circular interpolation in clockwise direction and absolute dimension
- Q 38. The correct sequence of operations in the Production Planning and Control process is
- a) Routing – Scheduling – Follow up – Dispatching
 - b) Scheduling – Follow up – Dispatching – Routing
 - c) Routing – Scheduling – Dispatching – Follow up
 - d) Dispatching – Routing – Scheduling – Follow up
- Q 39. The cost of insurance and taxes are included in
- a) Cost of ordering
 - b) Set up cost
 - c) Inventory carrying cost
 - d) Cost of shortages
- Q 40. The full form of PERT is _____
- a) Program Evaluation and Rate Technology
 - b) Program Evaluation and Robot Technique
 - c) Program Evaluation and Robot Technology
 - d) Program Evaluation and Review Technique