



Kerala Public Enterprises (Selection and Recruitment) Board

Opposite KELTRON, Vellayambalam, Thiruvananthapuram

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Version: B

Question Booklet No: 04725

Name of Examination: Mechanical Engineering

Date: 13/09/2026

Written examination for:

**(1) 047-2025 Senior Engineer - Maintenance (Executive Trainee -Mechanical)
-Travancore Cochin Chemicals Limited**

Instructions to Candidates:

1. Candidate should not start writing answers until indication is given to start answering.
2. The question paper contains 100 questions. Each question is provided with four choices (A), (B), (C) and (D) having one correct answer. Choose the correct answer and darken the Bubble corresponding to the question number using Blue or Black ball point pen in the OMR Sheet.
3. Each correct answer carries 1 mark. There will be no negative mark for wrong answers or unattended questions.
4. Do not write anything else on the question paper. Space for rough work is provided at the end.
5. No candidate will be allowed to leave the examination hall till the end of the session and without handing over his/her Answer Sheet to the Invigilator. Candidates should ensure that the Invigilator has verified all the entries in the 'Basic Data' portion and that the Invigilator has affixed his/her signature in the space provided in the OMR sheet.

Total number of questions: 100 Maximum marks: 100 Time: 90 Minutes

1	The main objective of lean manufacturing is			
	(A)	Waste elimination	(B)	Labour reduction
	(C)	Inventory increase	(D)	High cost
2	In forecasting, moving average is used to			
	(A)	Eliminate random fluctuations	(B)	Increase demand
	(C)	Predict fixed cost	(D)	Control production
3	A clutch is used to			

	(A)	Engage and disengage power	(B)	Stop motion
	(C)	Increase torque	(D)	Reduce speed
4	A four-bar mechanism has			
	(A)	1 degree of freedom	(B)	2 degrees of freedom
	(C)	3 degrees of freedom	(D)	None
5	Cast iron contains carbon in the range			
	(A)	0.1-0.5%	(B)	0.5-1.0%
	(C)	1.5-2.0%	(D)	2.0-4.0%
6	The non-metal used for making bullet-proof glass is			
	(A)	Nylon	(B)	Polycarbonate
	(C)	Epoxy	(D)	Teflon
7	The moment of inertia of a rectangular section of width b and depth d about its neutral axis is			
	(A)	$\frac{bd^3}{12}$	(B)	$\frac{bd^2}{6}$
	(C)	$\frac{b^2d^3}{6}$	(D)	$\frac{bd^3}{8}$
8	Poisson's ratio for steel is approximately			
	(A)	0.1	(B)	0.25
	(C)	0.3	(D)	0.5
9	The method used to solve assignment problems is			
	(A)	Hungarian method	(B)	Newton-Raphson method
	(C)	Simpson's rule	(D)	Bisection method
10	The main purpose of riser in casting is to			
	(A)	Feed molten metal during solidification	(B)	Allow gases to escape
	(C)	Act as a reservoir	(D)	Improve surface finish

11	In the Rankine cycle, the pump work is			
	(A)	Negligible	(B)	Equal to turbine work
	(C)	Maximum	(D)	Same as heat input
12	Cavitation in pumps occurs when			
	(A)	Pressure falls below vapour pressure	(B)	Pressure rises above vapour pressure
	(C)	Temperature decreases	(D)	Flow velocity decreases
13	The efficiency of a Carnot engine depends on			
	(A)	Working substance	(B)	Source and sink temperatures
	(C)	Compression ratio	(D)	Mean effective pressure
14	The main purpose of jigs and fixtures is to			
	(A)	Reduce material waste	(B)	Increase accuracy and productivity
	(C)	Improve surface finish	(D)	Reduce power consumption
15	Diesel cycle efficiency is higher than Otto cycle because			
	(A)	Diesel fuel has higher calorific value	(B)	Cut-off ratio is lower
	(C)	Average temperature of heat addition is higher	(D)	Compression ratio is lower
16	Fins are used to			
	(A)	Reduce heat transfer	(B)	Increase surface area for convection
	(C)	Change thermal conductivity	(D)	Reduce temperature difference
17	The pressure variation in a static fluid acts			
	(A)	Only vertically	(B)	Only horizontally
	(C)	Equally in all directions	(D)	Only normal to the bottom surface
18	A thin cylinder subjected to internal pressure fails mainly due to			
	(A)	Shear stress	(B)	Torsional stress
	(C)	Hoop stress	(D)	Longitudinal stress

19	Lagrange's equation is primarily used for			
	(A)	rotational equilibrium	(B)	Constraint equations
	(C)	Analytical dynamics	(D)	Beam deflection
20	The thermal conductivity of a perfect vacuum is			
	(A)	Very high	(B)	Very low
	(C)	Zero	(D)	Infinite
21	The device used to measure air velocity is			
	(A)	Venturi meter	(B)	Pitot tube
	(C)	Manometer	(D)	Orifice meter
22	Ceramics are			
	(A)	Brittle	(B)	Soft
	(C)	Ductile	(D)	Flexible
23	R-charts monitor			
	(A)	Process mean	(B)	Process variability
	(C)	Number of defectives	(D)	Cycle time
24	The stress concentration factor increases with			
	(A)	Decrease in notch radius	(B)	Increase in notch radius
	(C)	Increase in thickness	(D)	Increase in elastic modulus
25	A cam with high jerk causes			
	(A)	Smooth follower motion	(B)	Reduced stress
	(C)	Impact loading	(D)	Increased damping
26	Which non-ferrous alloy is used for aircraft structures?			
	(A)	Brass	(B)	Bronze
	(C)	Al-Mg-Si alloys	(D)	Cu-Ni alloys

27	The command “MO6” in CNC denotes:			
	(A)	End of program	(B)	Tool change
	(C)	Spindle on	(D)	Coolant on
28	In rolling, the phenomenon of “forward slip” occurs when			
	(A)	Strip speed < roll speed	(B)	Strip speed > roll speed
	(C)	Roll speed = strip speed	(D)	Roll force is zero
29	Heisler charts are used for			
	(A)	Steady conduction	(B)	One-dimensional convection
	(C)	Transient conduction	(D)	Radiation exchange
30	In a UTM tensile test, the yield point is identified by			
	(A)	Maximum load	(B)	Proportional limit
	(C)	Sudden increase in strain without increase in stress	(D)	Breaking point
31	A body is said to be in dynamic equilibrium when			
	(A)	It moves with constant velocity	(B)	It is at rest
	(C)	Acceleration is constant	(D)	Force is zero
32	Balancing of rotating masses is done to reduce			
	(A)	Noise	(B)	Vibration
	(C)	Friction	(D)	Heat
33	A governor is used to			
	(A)	Regulate fuel supply	(B)	Control speed
	(C)	Maintain constant load	(D)	Reduce vibration
34	Brass is an alloy of			
	(A)	Copper and Tin	(B)	Copper and Zinc
	(C)	Copper and Nickel	(D)	Copper and Aluminium

35	For a simply supported beam, maximum bending moment occurs at			
	(A)	Supports	(B)	Centre
	(C)	Quarter span	(D)	Neutral axis
36	The process of removing burrs and sharp edges is called			
	(A)	Lapping	(B)	Honing
	(C)	Deburring	(D)	Polishing
37	Shrinkage allowance is provided on			
	(A)	Pattern	(B)	Core
	(C)	Mould	(D)	Casting
38	In refrigeration, the COP of a heat pump is always			
	(A)	Less than unity	(B)	Equal to unity
	(C)	Greater than unity	(D)	Zero
39	The head loss due to friction in a pipe is given by			
	(A)	Bernoulli equation	(B)	Darcy-Weisbach equation
	(C)	Poiseuille equation	(D)	Hagen's law
40	The work done by a force is the product of			
	(A)	Force and acceleration	(B)	Force and displacement
	(C)	Mass and velocity	(D)	Momentum and distance
41	In SPT scheduling, jobs with -----are processed first			
	(A)	Higher due dates	(B)	Smaller processing times
	(C)	Larger processing times	(D)	Higher priority weights
42	Break-even analysis assumes			
	(A)	Nonlinear revenue	(B)	Constant selling price
	(C)	Variable fixed costs	(D)	Continuous inflation

43	A plant layout based on grouping machines for families of parts is			
	(A)	Product layout	(B)	Fixed layout
	(C)	Cellular layout	(D)	Process layout
44	In EOQ, the cost curve at the minimum point is			
	(A)	Symmetrical	(B)	Asymmetrical
	(C)	Flat with many minima	(D)	Circular
45	In inter-plant logistics, the primary objective is			
	(A)	Minimize holding cost	(B)	Optimize transport and transfer between plants
	(C)	Increase WIP	(D)	Increase batch sizes
46	The SPT scheduling rule			
	(A)	Minimizes make span	(B)	Minimizes flow time
	(C)	Minimizes machine idle time	(D)	Maximizes throughput
47	The most critical factor influencing factory location for heavy engineering industries is			
	(A)	Availability of skilled labour	(B)	Proximity to raw materials
	(C)	Climate conditions	(D)	Availability of bank facilities
48	In a mechanism, Grueblers equation applies to			
	(A)	All types of linkages	(B)	Only planar mechanisms
	(C)	Only spatial mechanisms	(D)	Only four-bar mechanisms
49	Whirling of a shaft occurs when			
	(A)	Speed of shaft is low	(B)	shaft speed equals natural frequency of lateral vibration
	(C)	Shaft has high damping	(D)	Shaft is vertical
50	Glass transition temperature (T_g) is associated with			

	(A) Ceramics	(B) Metals
	(C) Polymers	(D) All materials
51	A material subjected to sudden load experiences stress	
	(A) Equal to static stress	(B) Half of static stress
	(C) Double the static stress	(D) Zero stress
52	Hoop stress in a thin cylinder is	
	(A) $pD/4t$	(B) $pD/2t$
	(C) $2pD/t$	(D) pD/t
53	The relation between Young's modulus and shear modulus is	
	(A) $E=2G(1+\nu)$	(B) $E=G(1+2\nu)$
	(C) $E=\nu G$	(D) $E=G/\nu$
54	Maximum power transmission in a shaft occurs when:	
	(A) Torque = constant	(B) angle of twist = minimum
	(C) shear stress = zero	(D) twisting moment is 1/3 greater than that for full load
55	Mohr's circle is drawn to determine	
	(A) Only bending stress	(B) Only shear force
	(C) Principal stresses and maximum shear	(D) Deflection
56	A block of 100 N is on a horizontal rough surface. If limiting friction is 40 N, the coefficient of friction is	
	(A) 2.5	(B) 0.4
	(C) 0.25	(D) 4
57	In simplex method, a basic feasible solution must:	

	(A) Include all variables	(B) Satisfy non-negativity and constraints	
	(C) Maximize objective function	(D) Use only slack variables	
58	A CMM (Co-ordinate Measuring Machine) uses		
	(A) Mechanical cams	(B) Laser interferometry and probing	
	(C) Lead screws	(D) Pneumatic pistons	
59	Additive manufacturing supports:		
	(A) High-volume mass production	(B) Complex geometry fabrication	
	(C) Simple rectangular shapes only	(D) Only metallic materials	
60	In oxy-acetylene gas welding, the highest flame temperature occurs in		
	(A) Neutral flame	(B) Carburizing flame	
	(C) Oxidizing flame	(D) All flames have equal temperature	
61	Deep drawing is primarily used for manufacturing		
	(A) Shafts	(B) Thin-walled cups	
	(C) Gears	(D) Rivets	
62	For an impulse turbine		
	(A) All pressure drop occurs in nozzle	(B) All pressure drop occurs in runner	
	(C) Pressure drop is uniform	(D) Pressure drop is zero	
63	The compressibility factor (Z) for an ideal gas is		
	(A) $Z < 1$	(B) $Z > 1$	
	(C) $Z = 1$	(D) $Z = 0$	
64	Thermal diffusivity is the ratio of		
	(A) $k/\rho C_p$	(B) $\rho C_p/k$	
	(C) $k \cdot \rho C_p$	(D) $k C_p^2$	
65	Boundary-layer separation occurs when		

	(A)	Pressure decreases in direction of flow	(B)	Pressure increases in direction of flow
	(C)	Wall shear stress increases	(D)	Velocity gradient is zero
66	In a fully developed laminar flow through a circular pipe, the velocity profile is			
	(A)	Uniform	(B)	Parabolic
	(C)	Hyperbolic	(D)	Linear
67	Dynamic viscosity has the SI unit			
	(A)	$\text{N} \cdot \text{s}/\text{m}^2$	(B)	N/m^2
	(C)	m^2/s	(D)	kg/m^3
68	According to Euler's buckling theory, the critical load is inversely proportional to			
	(A)	L	(B)	L^2
	(C)	L^3	(D)	L^4
69	A block is released on a 30° inclined plane with no friction. Its acceleration is approximately			
	(A)	$2.5\text{m}/\text{s}^2$	(B)	$4.9\text{m}/\text{s}^2$
	(C)	$8.5\text{ m}/\text{s}^2$	(D)	$9.81\text{m}/\text{s}^2$
70	In project management, slack time means			
	(A)	Delay without affecting project completion	(B)	Maximum delay
	(C)	Unused time of labour	(D)	Excess inventory
71	Just – In-Time (JIT) aims to			
	(A)	Increase inventory	(B)	Eliminate waste
	(C)	Increase lead time	(D)	Increase set up time
72	The S-N curve is used to find			

	(A) Impact toughness	(B) Fatigue life
	(C) Hardness	(D) Ductility
73	The type of bearing used for heavy radial load is	
	(A) Thrust bearing	(B) Ball bearing
	(C) Roller bearing	(D) Journal bearing
74	The gear ratio in a simple gear train is	
	(A) Product of driven/driver gears	(B) Ratio of last to first gear teeth
	(C) Constant	(D) Zero
75	Hardenability is measured by	
	(A) Izod test	(B) Jominy test
	(C) Brinell test	(D) Vickers test
76	In powder metallurgy, sintering means	
	(A) Compacting	(B) Heating below melting point
	(C) Melting completely	(D) Cooling rapidly
77	The main alloying element in stainless steel is	
	(A) Nickel	(B) Chromium
	(C) Molybdenum	(D) Vanadium
78	The unit of modulus of elasticity is same as	
	(A) Strain	(B) Stress
	(C) Force	(D) Energy
79	The ratio of lateral strain to linear strain is called	
	(A) Modulus of rigidity	(B) Poisson's ratio
	(C) Bulk modulus	(D) Young's modulus
80	The deflection of a beam varies directly with	

	(A) Load	(B) Moment of inertia
	(C) Young's modulus	(D) Length ⁴
81	The maximum shear stress theory is also called	
	(A) Rankine theory	(B) Guest's theory
	(C) Tresca's theory	(D) Both A & B
82	EOQ stands for	
	(A) Economic Order Quantity	(B) Equal Order Quantity
	(C) Estimated Order Quantity	(D) Effective Output Quantity
83	Taylor's tool life equation relates	
	(A) Speed and tool life	(B) Feed and temperature
	(C) Depth of cut and time	(D) Hardness and wear
84	The grinding wheel speed is measured in	
	(A) RPM	(B) m/s
	(C) m/min	(D) rad/s
85	The dryness fraction of steam is measured by	
	(A) Calorimeter	(B) Thermocouple
	(C) Hygrometer	(D) Thermometer
86	In an impulse turbine, pressure drop occurs	
	(A) In nozzle	(B) In blades
	(C) In casing	(D) Throughout
87	In conduction through a plane wall, heat flow is directly proportional to	
	(A) Temperature difference	(B) Wall thickness
	(C) Area and $\Delta \{T\}$	(D) Time
88	The most efficient cycle for a gas turbine is	

	(A) Otto	(B) Diesel
	(C) Brayton	(D) Dual
89	For Laminar flow in a circular pipe, the velocity distribution is	
	(A) Parabolic	(B) Linear
	(C) Uniform	(D) Exponential
90	For air-standard Otto cycle, efficiency increases with	
	(A) Decrease in compression ratio	(B) Increase in compression ratio
	(C) Decrease in expansion ratio	(D) Increase in heat input
91	The bending moment at the free end of a cantilever beam is	
	(A) Maximum	(B) Minimum
	(C) Zero	(D) constant
92	The ABC analysis in inventory is based on	
	(A) Annual consumption value	(B) Item size
	(C) Storage volume	(D) Purchase price
93	The normal distribution curve is	
	(A) Symmetrical	(B) Skewed left
	(C) Skewed right	(D) Asymmetrical
94	Total Quality Management (TQM) focuses on	
	(A) Inspection	(B) Continuous improvement
	(C) Production speed	(D) Cost reduction only
95	CPM and PERT are used for	
	(A) Forecasting	(B) Scheduling and control
	(C) Design optimization	(D) Cost analysis
96	Break-even point occurs when	

	(A) Fixed cost=Variable cost	(B) Total cost = Total revenue	
	(C) Profit = Sales	(D) Cost = Zero	
97	The critical Reynolds number for flow through pipe is about		
	(A) 2300	(B) 1000	
	(C) 5000	(D) 4000	
98	Bernoulli's theorem is based on		
	(A) Law of energy conservation	(B) Law of mass conservation	
	(C) Newton's second law	(D) Pascal's law	
99	Maximum shear stress on Mohr's circle occurs at		
	(A) Zero radius	(B) Centre of circle	
	(C) Top and bottom points	(D) Points where normal stress=0	
100	The algebraic sum of moments about a point for a body in equilibrium is		
	(A) Unity	(B) Zero	
	(C) Infinite	(D) Constant	

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