Kerala Public Enterprises (Selection and Recruitment) Board

Version: **A**	Question Booklet No:**10825**
Name of Examination**: Mechanical Engineering**	**Date: 10/08/2025**

Common written examination for:

1) Assistant Manager (Maintenance) Mechanical, KSDPL (Category No. 065/2024)
2) Engineer/Officer, SIFL (Category No. 024/2024)
3) Assistant Manager (Mechanical), KEL (Category No. 083/2024)

Instructions to Candidates:

1. Candidate should not start writing answers until the indication is given to start answering.
2. The question paper contains **50 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 **2 marks.** There will be **no negative mark** for wrong or unattended questions.
4. Do not write anything else on the question paper. Sheet for rough work is appended to the question paper in 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: 50	Maximum marks: 100	Time: 90 Minutes

1. A 10 kg block rests on a horizontal surface with a coefficient of static friction of 3. What is the maximum horizontal force that can be applied without moving the block?

   A) 10 N B) 294 N

   C) 30 N D) 392 N

2. In a truss structure, a member that neither carries tension nor compression is called a :

   A) Redundant member B) Zero-force member

   C) Support member D) Diagonal member

3. Which of the following instruments is used to measure strain?

   A) Thermocouple B) Pilot tube

   C) Strain gauge D) Barometer

4. A simply supported beam of length L carries a uniformly distributed load w over its entire span. The maximum bending moment occurs at :

A) Ends B) Center

C) Quarter-span D) One-third span

5. Which of the following diagrams is used to represent shear force along a beam?

A) Stress-strain diagram B) Bending moment diagram

C) Shear force diagram D) Mohr's circle

6. A single degree of freedom damped system vibrates with a frequency of 5 Hz and a damping ratio of 01. What is the damped natural frequency?

A) 0 Hz B) 49 Hz

C) 51 Hz D) 55 Hz

7. If the strain energy stored in a material under axial load is U, what happens to U when the length of the specimen is doubled (keeping area and load constant)?

A) Halves B) Doubles

C) Quadruples D) Remains the same

8. A shaft of diameter d is subjected to a torque T. The shear stress developed in the shaft is proportional to:

A) T/d B) T/d^2

C) T/d^3 D) T/d^4

9. Which of the following is a property of an ideal fluid?

A) Viscosity B) Compressibility

C) No resistance to shear D) High density

10. Which law is used to determine the pressure drop in a pipe under laminar flow conditions?

A) Pascal's law B) Bernoulli's equation

C) Darcy-Weisbach equation D) Hagen–Poiseuille equation

11. Which of the following heat transfer modes does not require a medium?

A) Conduction B) Convection

C) Radiation D) All require medium

12. Which of the following is an intensive thermodynamic property?

A) Volume B) Entropy

C) Pressure D) Enthalpy

13. Which dimensionless number is used in natural convection heat transfer analysis?

A) Reynold's number B) Nusselt number

C) Prandtl number D) Grashof number

14. Which cycle is used in gas turbines?

A) Otto B) Rankine

C) Brayton D) Diesel

15. The COP (Coefficient of Performance) of an ideal refrigerator operating between 300 K and 270 K is:

A) 9 B) 10

C) 11 D) 12

16. The function of a diffuser in a turbine is to:

A) Increase velocity B) Decrease pressure

C) Increase pressure D) Increase temperature

17. In casting, a runner is used to

A) Vent gases B) Feed molten metal

C) Control cooling D) Increase strength

18. Tool life is most affected by

A) Speed B) Feed

C) Depth of cut D) Tool material

19. Fixtures are used for

A) Holding tool B) Holding workpiece

C) Lubrication D) Power

20. Initial stage in powder metallurgy?

A) Compaction B) Mixing

C) Sintering D) Finishing

21. EDM is a

A) Conventional process B) Non-traditional process

C) Welding method D) Cutting fluid

22. Casting defect due to improper venting is

A) Shrinkage B) Blowhole

C) Cold shut D) Misrun

23. Axial deformation is

A) PL/AE B) PE/AL

C) AL/PE D) AE/PL

24. Maximum bending moment of a cantilever beam occurs at

A) Fixed end B) Load point

C) Midspan D) Support

25. Simply supported beam resists

A) Torque B) Transverse load

C) Axial load D) Shear only

26. Maximum torsional stress is at

A) Centre B) Surface

C) Mid-radius D) Axis

27. Hoop stress is important in

A) Beams B) Shafts

C) Thin cylinders D) Plates

28. Cantilever deflection is maximum at

A) Fixed end B) Midspan

C) Free end D) Center

29. Hooke's law valid up to

A) Proportional limit B) Yield

C) Breaking D) Elastic limit

30. Strain energy is stored due to

A) Elastic strain B) Plasticity

C) Ductility D) Brittleness

31. Heat treatment alters

A) Structure & Hardness B) Mass

C) Conductivity D) Size

32. Brass is an alloy of

A) Copper & Zinc B) Copper & Tin

C) Lead & Zinc D) Steel & Iron

33. Vickers test uses

A) Ball B) Cone

C) Diamond D) Needle

34. Nanomaterials have

A) High surface area B) Low friction

C) High weight D) Large grains

35. Elastic modulus =

A) Stress/Strain B) Strain/Stress

C) Density D) Strength

36. Thermoplastics can be

A) Recycled B) Hardened

C) Crushed D) Burnt

37. The function of a flywheel is to

A) Store energy B) Regulate speed

C) Reduce vibration D) Absorb shock

38. Critical speed of shaft is related to

A) Torsion B) Natural frequency

C) Mass D) Strain

39. Epicyclic gear train is used in

A) Gearboxes B) Clocks

C) Differential D) All of these

40. In a cam-follower mechanism, dwell means

A) Constant motion B) Rest

C) Accelaration D) Change of direction

41. Which bearing is used for high-speed applications?

A) Journal B) Thrust

C) Ball D) Plain

42. The fatigue strength is best represented by

A) Endurance limit B) Yield stress

C) Ultimate stress D) Hardness

43. In machine design, S-N diagram is used for

A) Fatigue B) Creep

C) Stress D) Heat

44. The main aim of inventory control is

A) Reduce holding cost B) Increase sales

C) Improve quality D) Increase lead time

45. Linear programming is used for

A) Optimization B) Forecasting

C) Scheduling D) QC

46. PERT is useful for

A) Inventory B) Project management

C) Forecasting D) Layout

47. EOQ stands for

A) Economic Order Quantity B) Estimated Output Quality

C) Exact Order Quantity D) Efficient Ordering Queue

48. Break-even analysis is used in

A) Investment decision B) Job design

C) Inventory control D) Layout

49. Lean manufacturing aims to

A) Eliminate waste B) Increase manpower

C) Reduce automation D) Increase inventory

50. TQM stands for

A) Total Quantity Management B) Technical Quality Measures

C) Tool Quality Monitoring D) Total Quality Management

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