GATE Mechanical Engineering (ME-1) Question Paper (Memory-Based)

1. What is the relation between vapor pressure and saturated vapor pressure?

2. A Marine is on sea level. Given the atmospheric pressure, fluid pressure?

3. Cutting force and thrust force is given, calculate the shear force.

4. Resistance= 0.0001, time = 0.25, volume = 70 mm cube, unit= 12 Joule/ mm cube, current = 10,000 A, calculate the efficiency.

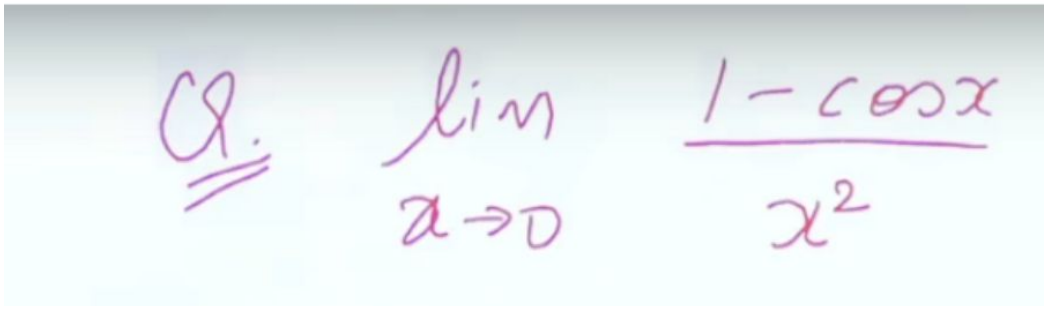
5. The correct sequence of the operation for drilling, boring, and reaming.

6. There is a submarine kept at a depth of h from the free surface of sea level. The atmospheric pressure is 101 KPa. There is a pressure measuring device on the submarine which is measuring the absolute pressure as 4.2 MPa. Find out the depth of this submarine from the free surface.

7. There is a cantilever beam. Given points A, B, and C, then calculate the deflection at point C.

8. There is an axis bar given loaded at different points. P is fixed, and the other points are Q, R, S, and T. The load is 25 KN at T, 20 KN at S, 15 KN at R, and 10 KN at Q. What is the maximum & minimum stress value.

9. There is a pipe with an outer diameter of 250 mm and an inner diameter of 230 mm. G factor is 60G. Calculate the revolution of the mold.

10. 

11. A= 6 days, B=11 days, C=8 days, D=15 days activities are present in a critical path in a PERT network. The mean and variance of the activity duration are given in the table (A= 4 day sq., B= 9 day sq., C= 4 day sq., D=9 day sq. This project is going to follow a normal distribution. So, what is the probability that the project completes in 40 days?

12. The processing time of jobs are given below: A, B, C, D, E, F, G, H. The first is turning machine (A =2, B= 4, C=8, D=9, E=7, F=6, G= 5, H= 10), 2nd is grinding machine (A =4, B= 1, C= 3, D= 7, E= 9, F= 5, G= 2, H= 4). Calculate the sequence of the jobs to be performed.

13. There is a circular plate on which a jet is striking. The jet is coming with velocity V, and after striking, it is deflected in a radially outward direction. The disk is now attached with spring with stiffness (K) as 1. The deflection is 1 cm. The diameter of the jet is 1 cm. What should be the value of the velocity?

14. The fundamental thermodynamic relation is DU = TdS + zdL. T stands for absolute temperature. z stands for surface tension. Find the correct Maxwell Relation.

15. In which pair of cycles given we have at least 1 isothermal process?

16.

Q The curve $F(x) = x^2 - 2x + 2$ becomes parallel to line joining the points $F(1)$ & $F(2)$. The value of x for which $F(x)$ becomes parallel to line is _____.