

BASIC MECHANICAL ENGINEERING (BME) IMPORTANT QUESTION BANK
BT-203

UNIT-1- PROPERTIES OF ENG. MATERIALS

1.	Explain the classification of engineering materials.
2.	Explain the properties of engineering materials.
3.	Explain the classification of cast iron and steel & also write down their applications.
4.	Explain the effect of alloying elements on steel.
5.	Explain the stress-strain diagram for ductile and brittle material.
6.	Explain any one method of measuring Hardness of a material in detail.
7.	Find the young's modulus of a brass rod of diameter 25 mm and of length 250 mm which is subjected to a tensile load of 50 k N when the extension of the rod is. equal to 0.3 mm. NOTE-Exercise more these types of questions.
8.	A rod 200 cm long & of diameter 3 cm is subjected to an axial pull of 30 KN. If the young's modulus of the material of the rod is $2 \times 10^5 \text{ N/mm}^2$, determine- I. Stress II. Strain III. Elongation of the rod NOTE-Exercise more these types of questions.

UNIT-2- ENGINEERING MEASUREMENT & PRODUCTION ENGINEERING

9.	Define – I. Measurement II. Errors in measurements III. Accuracy and precision
10.	Define construction & working of- I. Dial gauge II. Sine bar III. Micrometre IV. Vernier calliper
11.	What is lathe? Discuss the various parts & operations performed on the lathe.
12.	What is a drill machine? Discuss the various parts & operations performed on the lathe.
13.	What are the various methods of temperature measurement? explain any one of them. (RTD method)
14.	Define pressure. What are the various methods of pressure measurement? explain any one of them.
15.	Explain the methods of flow measurement. Explain any one of them. (Venturi meter)
16.	Explain casting & its advantages.

UNIT-3- FLUID PROPERTIES

17.	Define fluid & its types.
18.	Explain different fluid properties.
19.	Explain different types of fluid flow.
20.	Explain the Newton's law of viscosity and derive viscosity coefficient.
21.	State Pascal law. What do you mean by vacuum pressure?
22.	Define viscosity. What is the importance of viscosity while selecting the fluids in various engineering applications.
23.	Water is flowing through a pipe having diameter 300mm and 200mm in at the bottom and upper end respectively. The intensity of pressure at the bottom end is 24.525 N/cm^2 and the pressure at the upper end is 9.81 N/cm^2 . Determine the difference in datum head if the rate of flow through pipe is 40 lit./s. NOTE-Exercise more these types of questions.
24.	A flat plate of area of $1.5 \times 10^6 \text{ mm}^2$ is pulled with a speed of 0.4 m/s relative to another plate located at a distance of 0.15 mm from it. Find the force and power required to maintain this speed, if the fluid separating them is having viscosity as 1 poise. [1 poise = 0.1 N/M^2] NOTE-Exercise more these types of questions.
25.	A plate, 0.025 mm distant from a fixed plate, moves at 60 cm/s and requires a force of 2 N/unit area i.e. 2 N/m^2 to maintain this speed. Determine the fluid viscosity between the plates. NOTE-Exercise more these types of questions.
26.	State Bernoulli's theorem and mention the assumptions involved in it.
27.	State continuity equation and prove it.
28.	If 3 L of oil weights 24 N, calculates its mass density, weight density, specific volume, & specific gravity. NOTE-Exercise more these types of questions.
29.	Explain the working principle of fluid coupling.
30.	Explain construction and working of any one hydraulic turbine. [Pelton wheel (impulse turbine), Kaplan turbine (reaction turbine), Francis turbine (reaction turbine)].
31.	Explain working principal of Pump and compressor. {RECIPROCATING & CENTRIFUGAL}
<u>UNIT-4- Thermodynamics</u>	
32.	Write short note on- <ul style="list-style-type: none"> i. Latent heat ii. Sensible heat iii. Degree of super heat iv. Types of thermodynamic system v. Wet, dry saturated, superheated steam vi. Dryness fraction vii. Enthalpy, entropy, internal energy viii. Intensive and extensive properties

33.	state & explain Zeroth law of thermodynamics.
34.	state & explain first law of thermodynamics.
35.	state & explain second law of thermodynamics.
36.	Define boiler. Explain classification of boiler/steam generator.
37.	Differentiate between fire tube boiler and water tube boiler.
38.	Explain construction and working of water tube boiler (Babcock & Wilcox boiler).
39.	Explain construction and working of fire tube boiler (Cochran boiler).
40.	Define draught. Differentiate between natural & artificial draught.
41.	Find the temperature, enthalpy, entropy and internal energy of 1 kg of dry saturated steam at 10 bar. NOTE-Exercise more these types of questions.
42.	<p>In a boiler test 1250kg of coal are consumed in 24 hours. The mass of water evaporated is 13000kg and the mean effective pressure is 7 bar. The feed water temperature was 40°C, heating value of coal is 30000kJ/kg. The enthalpy of 1 kg of steam at 7 bar is 2570.7kJ. Determine:</p> <p>a) Equivalent evaporation per kg of coal</p> <p>b) Efficiency of boiler</p> <p>NOTE- STUDENTS SHOULD PRACTICE MORE OF THESE TYPES OF QUESTIONS.</p>
<u>UNIT-5- Reciprocating Machines</u>	
43.	Explain the working of 4- strokes petrol & diesel engine with P-V & T-S diagram.
44.	Explain the working of 2- stroke petrol & diesel engine with P-V & T-S diagram.
45.	<p>Derive the efficiency of –</p> <p>I. Otto cycle</p> <p>II. Diesel cycle</p> <p>III. Carnot cycle</p>
46.	<p>Define the following-</p> <p>I. Indicated power (I.P.)</p> <p>II. Brake power (B.P.)</p> <p>III. Mechanical efficiency</p> <p>IV. Mean effective pressure</p> <p>V. Terminology of engine</p>
47.	<p>Write down the difference between-</p> <p>I. 4 stroke & 2- stroke engine</p> <p>II. Petrol (S.I.) & diesel engine (C.I.)</p>
48.	Explain different parts of I.C. engines.