C09-EE-406

3478

BOARD DIPLOMA EXAMINATION, (C-09)

MARCH / APRIL - 2019

DEEE - IV SEMESTER EXAMINATION

GENERAL MECHANICAL ENGG

Time : **3** Hours] [Total Marks : **80**

PART - A 3×10=30

Instructions : *(1) Answer **ALL** questions.*
*(2) Each question carries **THREE** marks.*
(3) Answer should be brief and straight to the point.

1 Define Young's modulus and write the relation between Young's modulus and modulus of rigidity. **1+2**

2 Define : (a) Elastic limit $1\frac{1}{2}$

(b) Factor of safety $1\frac{1}{2}$

3 A MS shaft transmitting power is subjected to a torque of 2860 N-m. If the angle of twist is 1^{o} in a length of 1498 mm and modulus of rigidity is 0.79×10^{5} N/mm^2, calculate the diameter of shaft. **3**

4 Define power. Write the formula for power transmitted by a shaft. **1+2**

5	List the advantages of I.C. engine over external combustion engines.	**3×1**
6	Distinguish between the Kaplan turbine and Francis turbine.	**3×1**
7	State the functions of boiler mountings.	**3×1**
8	State the working principle of impulse steam turbine.	**3**
9	State the purpose of a lubricant.	**3**
10	How impellers are arranged to produce high head and to deliver high discharge in centrifugal pump ?	**3**

PART - B **10×5=50**

Instructions : *(1) Answer any **FIVE** questions.*
*(2) Each question carries **TEN** marks.*
(3) Answer should be comprehensive and the criterion for valuation is the content but not the length of the answer.

11	A bar of length 3m has a diameter of 50 mm over half of its length and a diameter of 25 mm over the other half. If $E = 2.06 \times 10^5$ N/mm^2 and the bar is subjected to a pull of 50 kN, find the stress in each section and total extension of the bar.	**6+4**
12	A steel bar 50 mm wide 10 mm thick and 300 mm long is subjected to an axial pull of 84 kN. Find the change in length and width. Take $E = 2 \times 10^5$ N/mm^2 and 1/m = 0.32.	**6+4**

13 Determine the diameter of solid shaft to transmit 450 KW of power at 100 r.p.m. The maximum torque is 15% greater than the mean torque. The allowable shear stress should not exceed 65 N/mm^2 and angle of twist in 3m should not exceed 1^o. Take $G = 0.82 \times 10^5$ N/mm^2. **10**

14 Distinguish between four stroke engine and two stroke engine. **5×2**

15 (a) Explain the construction details of IC engine with the help of legible sketch. **3+3**

(b) List the materials used for components I.C. Engine. **4**

16 Write short notes on : **5+5**

(a) Carburetor

(b) Fuel injection pump.

17 (a) Differentiate between fire tube and water tube boiler. **6**

(b) List the various mountings used in boiler. **4**

18 (a) Draw a legible sketch of a centrifugal pump and label the parts. **4+4**

(b) State the function of casing in the centrifugal pump. **2**