



C14-EE-306

4248

BOARD DIPLOMA EXAMINATION, (C-14)  
OCT/NOV—2016  
DEEE—THIRD SEMESTER EXAMINATION  
GENERAL MECHANICAL ENGINEERING

Time : 3 hours ]

[ Total Marks : 80

PART—A

3×10=30

**Instructions :** (1) Answer **all** questions.  
(2) Each question carries **three** marks.  
(3) Answers should be brief and straight to the point and shall not exceed *five* simple sentences.

1. Define Hooke's law and write its equation.
2. State the relationship between Young's modulus and rigidity modulus, Young's modulus and Bulk modulus.
- \* 3. A solid circular shaft of 100 mm diameter is used to transmit torque. Find the maximum torque transmitted by the shaft, if the maximum shear stress induced in the shaft is  $50 \text{ N/mm}^2$ .
4. State the torsion equation and explain the terms involved.
5. Write the functions of spark plug and governor.
6. State any three functions of carburetor.
7. Write any three comparisons between fire tube and water tube boilers.

8. Give the classification of steam turbine based on action of steam with example for each one.
9. What is priming?
10. Write the functions of bearings.

**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. The following readings are obtained from a tensile test of a specimen :

Diameter of the specimen	= 20 mm
Gauge length	= 100 mm
Extension on at a load of 100 kN	= 0.15 mm
Load at yield point	= 120 kN
Maximum load	= 200 kN
Final length	= 170 mm
Diameter of neck	= 12.6 mm

Calculate the following :

- (i) Yong's modulus
- (ii) Stress at yield point
- (iii) % elongation
- (iv) % reduction in area
- (v) Working stress if factor of safety is 3

12. A bar of length 3 m has a diameter of 50 mm over half of its length and a diameter of 25 mm over the other half.  $E = 2.06 \times 10^5 \text{ N/mm}^2$  and the bar is subjected to a pull of 50 kN. Find the stress in each section and the total extension of the bar.

- 13.** Find the diameter of solid circular shaft required to transmit 750 kW at 250 r.p.m. It is specified that the maximum shear stress must not exceed  $50 \text{ N/mm}^2$  and the angle of twist must not exceed  $2^\circ$  in a length of 2 m.
- 14.** Explain with the help of line sketch, the working principle of 2-stroke diesel engine.
- 15.** Describe the working of fuel injection pump with a neat sketch.
- 16.** Explain the working of a simple vertical boiler with a neat sketch.
- 17.** Write the differences between impulse and reaction steam turbine.
- 18.** Describe the working of the jet pump with a neat sketch.

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