

7522

BOARD DIPLOMA EXAMINATION, (C-20)

JUNE/JULY—2022

DEEE— FOURTH 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 the term ductility and malleability.
2. Define the toughness of a material.
3. Define torque and give its mathematical relation.
4. Write the formula for polar moment of inertia for solid and hollow shafts.
5. Define TDC and BDC.
6. Write the classification of IC engines.
7. State the function of the boiler in a thermal power plant.
8. List any three main parts of Francis turbine.
9. Write in brief about the jet pump.
10. List any three main components of a centrifugal pump.

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**PART—B**

8×5=40

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

- 11.** (a) A hollow steel column of outer diameter 200mm has to support an axial load of  $2 \times 10^6$ N. If the ultimate stress for the steel column is  $480 \times 10^6$ N/m<sup>2</sup>. Determine the inner diameter of the column. Take factor of safety as 4.

**(OR)**

(b) Define the following terms.

- (i) Young's modulus
- (ii) Rigidity modulus
- (iii) Bulk Modulus
- (iv) Poisson's Ratio

- 12.** (a) A solid shaft is to transmit 350 KW power at 110 r.p.m. if the maximum shear stress induced must not exceed 90 N/mn<sup>2</sup>. Find the diameter of the shaft.

**(OR)**

(b) State the functions of shafts and classify shafts.

- 13.** (a) Write in brief about the following terms related to IC engines :

- (i) Piston
- (ii) Inlet and exhaust valves
- (iii) Crankshaft
- (iv) Camshaft

**(OR)**

(b) Explain with the help of a sketch, the working principle of 2-stroke diesel engine.

- 14.** (a) Define safety valve in boilers and explain the construction and working of spring loaded safety valve with a neat sketch.

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**(OR)**

(b) Classify steam turbines and distinguish between impulse and reaction turbines.

**15.** (a) Explain the working of the centrifugal pump with a neat sketch.

**(OR)**

(b) Explain the construction and working of a single acting reciprocating pump with a neat sketch.

**PART—C**

10×1=10

**Instructions :** (1) Answer the following question.

(2) The question carries **ten** marks.

**16.** Explain the following for petrol engine :

(i) Coil ignition system

(ii) Magneto ignition system

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