

6240

BOARD DIPLOMA EXAMINATION, (C-16)

MAY/JUNE—2023

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. State Hook's law.
2. Draw the stress-strain diagram for mild steel and label salient points on it.
3. Define polar moment of inertia.
4. Write the formula for polar moment of inertia for (a) solid shaft and (b) hollow shaft.
5. List out any six parts of diesel engine.
6. Write any three differences between diesel and petrol engine.
7. List out six boiler mountings.
8. Write any three differences between impulse and reaction steam turbines.
9. Write three classifications of hydraulic turbines.
10. Write classification of hydraulic pumps.

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## PART—B

10×5=50

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

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

Diameter of the specimen	=	16 mm;
Gauge length	=	80 mm;
Extension on at a load of 80 kN	=	0.15 mm;
Load at yield point	=	90 kN;
Maximum load	=	130 kN;
Final length	=	106 mm;
Diameter of neck	=	9.8 mm;

Calculate the following :

- (a) Young's modulus
- (b) Stress at yield point
- (c) Ultimate tensile stress
- (d) Working stress if factor of safety is 4
- (e) % of elongation
- (f) % of reduction in area

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**12.** A solid steel shaft of 200 mm diameter transmits power at 250 rpm. If maximum shear stress induced in it is  $35 \text{ N/mm}^2$ , calculate (a) power transmitted in kW, (b) the angle of twist per meter length of shaft, when  $G = 80 \text{ kN/mm}^2$  and (c) the value of shear stress at a radius of 30 mm from center.

**13.** Explain, with a neat sketch, the working principle of 4-stroke petrol engine.

**14.** Explain the working of zenith carburetor with a neat sketch.

**15.** Explain the working of LaMont boiler with a neat sketch.

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- 16.** Explain the principle and working of Parson's reaction turbine.
- 17.** Write the differences between centrifugal pumps and reciprocating pumps.
- 18.** Explain the working principle of jet pump with a neat sketch.

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