C16–EE–**406**

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BOARD DIPLOMA EXAMINATION, (C–16)
MARCH/APRIL—2018
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 *(a)* ultimate strength and *(b)* factor of safety.

2. Define Poisson's ratio and write its units.

3. State the function of shaft.

4. Define polar moment of inertia.

5. What is stroke length in an IC engine?

6. Mention any three advantages of IC engines over external combustion engines.

7. What is the function of a boiler?

8. State the function of the safety valve.

9. State the purpose of priming.

10. What is the purpose of lubrication?

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PART—B
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10×5=50

Instructions : (1) Answer *any* **five** questions.

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

(3) Answers should be comprehensive and the criterion for valuation is the content but not the length of the answer.

11. A mild steel bar has a diameter of 40 mm and is 500 mm long. A tensile load of 70 kN is applied longitudinally. Calculate the elongation of the bar, the change in the diameter and the change in volume. Take E 2 10^5 N/mm and Poisson's ratio as 0·3.

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

Diameter of the specimen = 20 mm

Gauge length = 100 mm

Extension 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 *(a)* Young's modulus, *(b)* stress at yield point, *(c)* percentage of elongation, *(d)* percentage of reduction in area, *(d)* percentage of reduction in area and *(e)* working stress taking factor of safety 3.

13. Determine the diameter of solid shaft to transmit 450 kW of power at 100 RPM. 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 3 mt should not exceed 1°.

Take $G = 0.82 \times 10^5$ N/mm^2.

14. State the differences between spark ignition engines and compression ignition engines.

15. Explain the working of two-stroke petrol engine with neat sketch.

16. Write short notes on the following :

    (a) Feed check valve

    (b) Steam stop valve

17. State the differences between impulse and reaction steam turbines.

18. Explain the working of centrifugal pump with the help of a neat diagram.

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