C09–EE–406

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BOARD DIPLOMA EXAMINATION, (C–09)
MARCH/APRIL—2014
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 following :

(a) Hooke's law

(b) Proportional limit

2. Define the following :

(a) Bulk modulus

(b) Modulus of rigidity

3. A solid shaft of 20 mm diameter transmits power at 750 r.p.m. The maximum shear stress in the shaft is 80 N/mm^2. Determine the power transmitted by the shaft.

4. What is a shaft? State its functions.

5. State the function of boiler mountings and accessories.

6. Classify the steam turbine based on action of stream.

7. State the function of inlet valve and exhaust valve.

8. Distinguish between the Kaplan turbine and Francis turbine.

9. State the function of lubricant.

10. Write the classification of multistage centrifugal pump.

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PART—B

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10×5=50

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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 bar of steel is 700 mm long. For the first 200 mm, it is 25 mm in diameter. For the next 300 mm, it is 20 mm in diameter and for the remaining length, it is of 15 mm in diameter. Find the change in length if it is subjected to a tensile load of 100 kN, $E = 2 \cdot 1 \times 10^5 \, N/mm^2$.

12. A steel bar 50 mm wide, 10 mm thick and 30 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 $l/m = 0 \cdot 32$.

13. A solid shaft of 125 mm diameter transmits 90 kW power at 200 r.p.m. Taking modulus of rigidity of $0 \cdot 85 \times 10^5 \, N/mm^2$, determine—

(a) angle of twist in a length of 800 mm;

(b) shear stress at a radius of 40 mm.

14. *(a)* Differentiate between gas turbine and IC engine.

(b) What are the applications of gas turbine?

15. Describe the working of any one type of fire tube boiler with a neat sketch.

16. Draw a neat sketch of simple carburetor and explain its working.

17. Distinguish between four-stroke engine and two-stroke engine.

18. Explain the principle of operation of centrifugal pump with a neat sketch.

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