



C14-EE-306

4248

BOARD DIPLOMA EXAMINATION, (C-14)
OCT/NOV—2017
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 stress and strain.
2. A mild steel bar carries an axial load of 75 kN. If the allowable tensile stress is 50 N/mm^2 , find the diameter of the rod.
3. Define the terms polar modulus of section.
4. Find the power transmitted by a 75 mm diameter shaft at 140 r.p.m at a maximum shear stress of 60 N/mm^2 .
5. Compare 4-stroke cycle engine with 2-stroke engine.
6. State the functions of (a) piston rings and (b) connecting rod.
7. What is the function of a boiler?

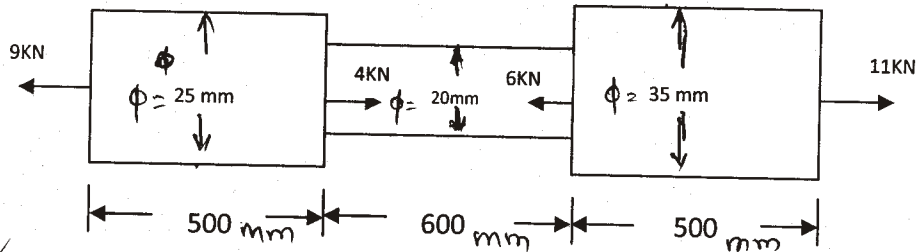
- * 8. Explain working principle of steam turbine.
9. Write the classification of multistage centrifugal pump.
10. What is bearing? What are its functions?

PART—B

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 steel bar 1600 mm long is acted upon by forces as shown in the fig. determine the total elongation of the bar if $E = 100 \text{ GN/m}^2$.



12. A bar 30 mm × 300 mm × 250 mm long is subjected to a pull of 90 kN in the direction of its length. The extension of bar was found to be 0.125 mm, while the decrease in each lateral dimension is found to be 0.00375 mm. Find the Young's modulus, Poisson's ratio, Modulus of rigidity and bulk modulus for the material of the bar.

- * 13. A hollow shaft is to have an outside diameter D and inside diameter $D/2$. Calculate the minimum value of D if it is to transmit 375 kW at 105 r.p.m with a working stress of 40 N/mm^2 . Determine the twist in the length equal to 10 times the external diameter. Take $C = 8 \times 10^4 \text{ N/mm}^2$.

- * 14. Sketch and explain the working of 4-stroke diesel engine.
15. Write a short note on (i) carburetor and (ii) fuel injection pump.
16. Explain simple vertical boiler with a neat sketch.
17. Differentiate between impulse and reaction turbine.
18. Explain the construction of a centrifugal pump with neat sketch.
