



C14-EE-306

4248

**BOARD DIPLOMA EXAMINATION, (C-14)**  
**MARCH/APRIL—2017**  
**DEE—THIRD SEMESTER EXAMINATION**  
**GENERAL MECHANICAL ENGINEERING**

Time : 3 hours ]

[ Total Marks : 80

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**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. What is the significance of the following points on a stress-strain diagram of mild steel bar?

- (a) Elastic limit  
(b) Breaking point

2. Define the following :

- (a) Ultimate stress  
(b) Working stress

3. What is a shaft? Classify it.

4. (a) What is the torsional rigidity in relation with shafts?  
(b) What are the materials used for manufacturing shafts?

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5. List any three differences between 4-stroke and 2-stroke IC engines.
6. What are the different methods of governing of IC engines?
7. What is the function of boiler? What is the draught in a boiler?
8. Compare impulse turbine with reaction turbine.
9. What are the differences between single-stage and multi-stage centrifugal pumps?
10. List the applications of lubricants.

**PART—B**

10×5=50

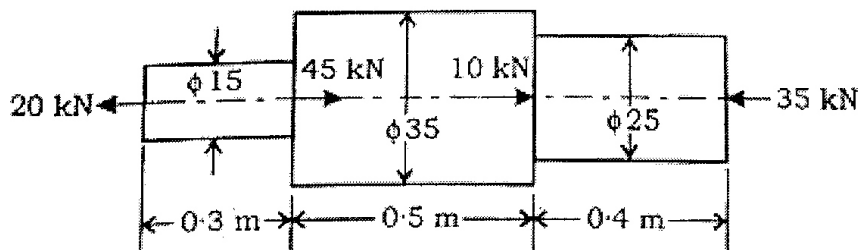
**Instructions** : (1) Answer *any five* questions.

(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 bar of 25 mm diameter is subjected to a pull of 50 kN. The measured elongation over a gauge length of 200 mm is 0.1 mm and the change in diameter is 0.0035 mm. Find the Poisson's ratio and the three elastic constants.

12. A bar of varying cross section is subjected to axial loads as shown in the figure. Find the stress in each section :



- \* **13.** A solid steel shaft of 100 mm diameter transmits 75 kW at 150 r.p.m. Calculate—
- (a) torque on the shaft;
  - (b) the maximum shear stress;
  - (c) the angle of twist in a length of 600 mm;
  - (d) the shear stress at a radius of 30 mm.
- Take  $G = 80$  GPa.
- 14.** Compare petrol (SI) engines with diesel (CI) engines.
- 15.** Write in brief about the following terms related to IC engines :
- (a) Stroke
  - (b) Clearance volume
  - (c) Compression ratio
  - (d) Cylinder liner
  - (e) Flywheel
- 16.** Describe the working of Benson boiler with neat a sketch.
- 17.** With the help of a neat sketch, explain the working of—
- (a) dead weight safety valve;
  - (b) feed check valve.
- \* **18.** Describe the working of a single stage-centrifugal pump with a neat sketch.

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