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BOARD DIPLOMA EXAMINATION, (C-09)
MARCH/APRIL - 2019
DIPLOMA IN ELECTRICAL & ELECTRONICS ENGINEERING
GENERAL MECHANICAL ENGINEERING
FOURTH SEMESTER EXAMINATION

Time: 3 Hours   **Total Marks: 80**

PART - A   (10 x 3 = 30 Marks)

Note 1:Answer all questions and each question carries 3 marks

2:Answers should be brief and straight to the point and shall not exceed 5 simple sentences

1. A circular bar of diameter 15 mm and length 200 mm extends 0.15 mm under a tensile load of 25 kN. Find the modulus of elasticity.

2. For a given material young's modulus is $0.9 \times 10^5 N/mm^2$ and the modulus of rigidity is $0.35 \times 10^5 N/mm^2$. Find the bulk modulus and Poisson's ratio.

3. Define polar moment of inertia. Find the polar moment of inertia of a circle of radius 250mm.

4. Write the torsion equation and mention the terms involved along with their units.

5. State the differences between impulse steam turbine and reaction steam turbine.

6. State the functions of boiler mountings?

7. State the function of (a) crank (b) cam shaft

8. What are the various methods of governing an I.C engine?

9. State the purpose of a lubricant.

10. State working principle of centrifugal pump.

PART - B   (5 x 10 = 50 Marks)

Note 1:Answer any five questions and each question carries 10 marks

2:The answers should be comprehensive and the criteria for valuation is the content but not the length of the answer

11. A steel bar 50mm wide 10mm thick and 300mm long is subjected to an axial pull of 84KN. Find the change in length and width. Take $E=2 \times 10^5 N/mm^2$ and 1/m=0.32.

12. The following results are obtained from a tensile test on a M.S Specimen
   (a) Diameter of the specimen   = 40mm
   (b) Gauge length   = 200mm
   (c) Extension at a load of 42.5kN   = 333×10^{-4} mm
   (d) Load at yield point   = 162.1 kN
   (e) Maximum load   = 252 kN
   (f) Length of specimen at fracture   = 250mm
   (g) Diameter of neck   = 35.5mm
   (h) Factor of safety   = 3
   Calculate:
   (i)   Young's modulus
   (ii) Stress at yield point
   (iii) Working stress
   (iv) The ultimate stress
   (v)   The percentage elongation and
   (vi) The percentage Reduction .

13. A hollow shaft is required to transmit 400KW at 240r.p.mThe maximum torque is 20% greater than mean torque. The permissible shear stress is 60 N/mm^2. The twist along a length of 4m is not to exceed 15 degrees. The ratio between inner and outer diameter is 2/3, calculate inner and outer diameter of the shaft. Take G=80KN/mm^2.

14. (a) How does the mixture of air and fuel in the combustion chamber of C.I engine differ from that of a S.I engine?
   (b) Distinguish between the S.I and C.I engine.

15. (a) What are advantages & disadvantages of gas turbine over I.C engine?
   (b) How do you classify gas turbines?

16. Explain the working of Francis turbine with a neat sketch.

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

18. Explain working of multi stage centrifugal pump.

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