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C20-MNG-303

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**BOARD DIPLOMA EXAMINATION, (C-20)
OCTOBER/NOVEMBER—2023**

**DMNG – THIRD SEMESTER EXAMINATION
BASIC 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 (i) Coefficient of friction and (ii) Angle of friction.
2. What is first order lever?
3. Write the differences between ideal machine and practical machine.
4. List various power transmitting drives.
5. State the differences between open belt drive and crossed belt drive.
6. What is the effect of slip on velocity ratio of belt drive?
7. What are the advantages of chain drive over belt drive?
8. Define stress and write the mathematical expression for it.
9. Define (a) Hooks law and (ii) Strain.
10. List types of fuels with examples.

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

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

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

- 11.** (a) A load of 500 N resting on rough inclined plane can be moved up the plane by a force of 350 N. The inclination of the plane is 30° to the horizontal and the force is applied parallel to the plane.

(OR)

- (b) A weight of 250 N resting on a rough horizontal surface. If the coefficient of friction between the surfaces is 0.3, then determine the least value of the effort required acting an angle of 45° with the horizontal.

- 12.** (a) Explain the working principle of double purchase crab with a neat sketch and derive expression for its velocity ratio.

(OR)

- (b) Explain the first and third system of pulleys with a neat sketches.

- 13.** (a) Explain the working principle of compound gear train with a neat sketch.

(OR)

- (b) Two pulleys 800 mm and 500 mm diameters are connected by a belt. Central distance between the pulleys shafts is 6 m. Find the length of the belt for (i) open belt drive and (ii) crossed belt drive.

- 14.** (a) Explain the mechanical properties of materials.

(OR)

- (b) Explain the following terms (i) Poisson's ratio, (ii) Young's modulus, (iii) Shear modulus and (iv) Bulk modulus and write the relation between them.

- 15.** (a) Explain the construction and working of four-stroke petrol engine with a neat sketch.

(OR)

(b) Explain the fuel supply system of a diesel engine with a neat sketch.

PART—C

10×1=10

- Instructions :** (1) Answer the following question.
(2) Each question carries **ten** marks.
(3) Answers should be brief and straight to the point and shall not exceed five simple sentences.

16. Discuss why a single stage reciprocating air compressor is widely used for general applications with a neat sketch.

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