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C14–MNG–402

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BOARD DIPLOMA EXAMINATION, (C–14)

MARCH/APRIL—2018

DMNG—FOURTH 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. Write the types of friction.

2. Draw the second system of pulley.

3. Define the following terms related to simple machine :

(a) Efficiency

(b) Mechanical advantage

4. Write short note on rope drives.

5. State the advantages of class drive over other drives.

6. Briefly write about any three mechanical properties of material.

7. List out the types of beam.

8. Write any three differences between diesel and petrol engine.

9. Write the uses of compressed air.

10. Write any three advantages of multistage compression.

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 load of 2500 N is to be raised by a screw jack with a mean diameter of 75 mm and pitch of 12 mm. Friction coefficient between the screw and nut is 0·075. Find the efficiency.

12. In a double-purchase crab which of teeth of pinions are 20 and 25 and that of spur wheels are 50 and 60. Length of the handle is 2 m and radius of load drum is 0·25 m. If the efficiency of the machine is 60%, find the effort required to lift the load of 720 N.

13. *(a)* Define coupling and write the functions of coupling.

(b) Write the types of coupling and uses of couplings.

14. In a belt drive diameter of driven pulley is 0·25 m and the cross-section of belt is 120 mm × 9 mm. The maximum stress in the belt material is 1·2 N/mm^2. Determine the initial tension, if the coefficient of friction is 0·3 and angle of contact is 2·9 radiants.

15. Draw the stress-strain diagram for ductile material. Define the salient points.

16. A hollow cylinder 2 m long has an outer dia 50 mm and inner dia 30 mm. If the cylinder is carrying a load of 25 kN, find the stress in cylinder. Also find the deformation of the cylinder if the modulus of elasticity is 100 GPa.

17. Explain the working of a 2-stroke petrol engine with neat sketch.

18. Explain the working of a single-stage reciprocating air compressor with neat sketch.

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