



C14-M-502

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BOARD DIPLOMA EXAMINATION, (C-14)
OCT/NOV—2017
DME—FIFTH SEMESTER EXAMINATION

DESIGN OF MACHINE ELEMENTS—II

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. State the advantages of silent chain over a roller chain.
2. Write any three differences between belt drive and chain drive.
3. A gear of 44 teeth has pitch circle diameter of 352 mm. What is its module and circular pitch?
4. Define (a) diametrical pitch and (b) backlash of a gear.
5. State any three differences between flywheel and governor.
6. Define effort and power of governor.
7. What is the function of clutch?

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8. State the different types of brakes.
9. What are the types of cams?
10. Explain the functions of a radial cam.

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 pulley of 300 mm diameter running at 200 r.p.m. drives another pulley at 120 r.p.m. Determine the size of driven pulley and belt speed under the following conditions :
- (a) Neglect slip and belt thickness
 - (b) Considering belt thickness of 5 mm
 - (c) Considering belt thickness of 5 mm and a total slip of 5·1
12. (a) A belt is required to transmit 15 kW from a pulley of 1000 mm diameter at 420 r.p.m. The angle of lap is 160° and coefficient of friction is 0·3. If the safe working stress of belt material is $1\cdot2 \text{ N/mm}^2$, find the width of belt. Thickness of belt is 10 mm.
- (b) Define the following terms of a flywheel :
- (i) Fluctuation of speed
 - (ii) Maximum fluctuation of speed
 - (iii) Coefficient of fluctuation of speed
 - (iv) Fluctuation of energy
 - (v) Maximum fluctuation of energy
13. A set of gear has to transmit 30 kW power when the pinion rotates at 400 r.p.m. The gear ratio is 1:4, the permissible stresses for pinion and drive gear materials are 130 N/mm^2 and 110 N/mm^2 respectively. The pinion gear has 22 teeth and face width 12 times the module. Compute (a) module and (b) face width.

- 14.** Discuss the following :
(a) Reverted gear train
(b) Classification of follower
- 15.** Explain the porter governor with a neat sketch.
- 16.** Draw the cam profile to give the following motions to a 20-mm roller follower :
(a) Outward stroke during 90° of cam rotation
(b) Dwell for the next 30° of cam rotation
(c) Return stroke during 120° of cam rotation
(d) Dwell for the remaining part of cam rotation
- The stroke of the follower is 30 mm and the minimum radius of the cam is 40 mm. The axis of the follower is passing through the axis of the cam. The follower moves with uniform acceleration and retardation during both strokes.
- 17.** Explain the working of block brake with a neat sketch.
- 18.** Explain the working of multiplate clutch with a neat sketch.
