C14-M-**502**

4643

BOARD DIPLOMA EXAMINATION, (C-14)

MARCH / APRIL - 2019

DME - V 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) Answer should be brief and straight to the point
                           and shall not exceed five simple sentences.

1   Mention any three important factors required to select a suitable power drive, one or two lines each.

2   Two parallel shafts 6m apart are provided with pulleys 600 mm and 800 mm diameter. Find the length of belt for turning the two shafts in same direction.

3   Define the terms (a) circular pitch, (b) back lash.

4   A wheel has 36 teeth and circular pitch 24 mm. Find (a) pitch circle diameter (b) diametral pitch.

5   Write any three differences between flywheel and governor.

6   Define the terms : (a) fluctuation of energy (b) fluctuation of speed.

7   State the major functions of brake.

8 A friction clutch transmits power at 250 rpm the single disc clutch is effective on both sides the outer and inner diameters of the friction plate are 200 mm and 120 mm respectively. Maximum intensity of pressure is 0.078 N/mm² coefficient of friction is 0.3, find the axial load.

9 Write any three applications of cam.

10 Define : (a) Cam profile (b) Base circle.

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**PART - B**   **10×5=50**

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11 A belt transmitting power from a motor to machin weighs 24 N/m and maximum permissible lesion in it is 1000 N. The angle of contact is spread over 5/9 of the pulley circumference. Coefficient of friction is 0.28 if the belt runs under maximum power conditions. Determine the optimum belt speed and maximum power transmitted.

12 (a) Find the pitch diameter, circular pitch, thickness of teeth, whole depth, clearance of the teeth of spur gear having no. of teeth 36, and module 6 mm.

   (b) Write any five differences between belt drive and chain drive.

13 A lathe back gear arrangement is to provide total speed reduction of about 12:1 from the cone pulley to the spindle to which are coaxial. The module of hight speed and low speed pairs are 5 mm and 6 mm respectively. Determine the number of teeth and the exact total reduction on the different wheels. If the pinions have nearly equal teeth. The center distance is 300 mm.

14 The turning moment diagram for a petrol engine is drawn to the following scales Turning moment 1 mm 5 Nm.

Crank angle 1 mm 3º

Turning moment diagram repeats itself at every half revolution of the engine and the areas above and below mean turning moment line taken in order are 295, 685, 40, 340, 960, 270 mm² determine the fluctuation of energy and mass of the flywheel when coefficient of fluetuation of speed is 3% and the engine runs at 180 rpm and radius of gyration is 0.65 m.

15 (a) Briefly explain porter governor with neat sketch.

    (b) Define : (i) cam angles (ii) pressure angle (iii) lift
         (iv) Dwell (v) Prime circle.

16 A single block brake is shown in fig. The coefficient of friction between friction lining and the drum is 0.4. If the drum diameter is 0.7 m. What operating force is required to sustain a brake torque of 200 Nm. If the direction of rotation is clock wise.
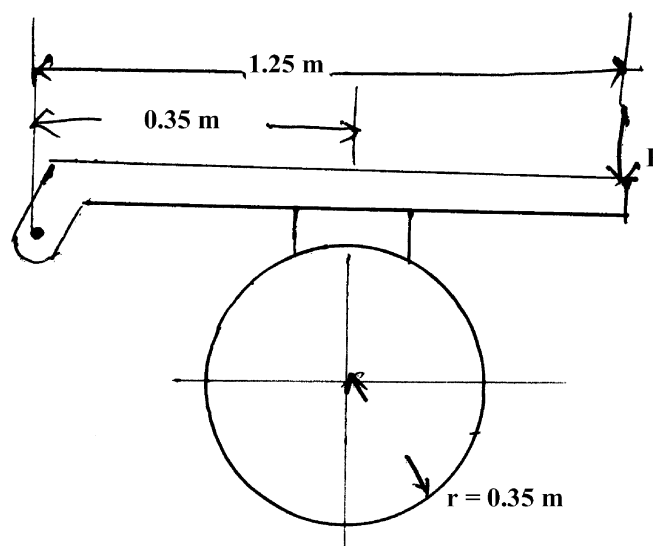
17 In a single disc cluth the outside diameter of contact surface is 280 mm and inside diameter is 180 mm. If coefficient of friction is 0.2 and allowable intensity of pressure is 0.12 N/mm^2. Calculate (a) axial force (b) powe transmitted at 900 rpm.

18 Draw the cam profile for a knife edge follower with simple harmonic motion whose

   (a)   lift the follower through 40 mm during 60º with SHM.

   (b)   the follower remains at rest for the next 45º of rotation of the cam.

   (c)   the follower then descends its original position during 90º rotation of cam with SHM.

   (d)   the follower remains at rest for the remaining part of the revoluotion the least diameter of the cam is 50 mm and the axis of knife edge follower passes through the axis of the cam shaft.

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