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C14-M-502

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BOARD DIPLOMA EXAMINATION, (C-14)
OCTOBER/NOVEMBER-2018
DME - FIFTH SEMESTER EXAMINATION

DESIGN OF MACHINE ELEMENTS – II

Time : 3 Hours]

[Total Marks: 80

PART-A

3X10=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 the three important factors to be considered while selecting type of drive

2. Write three advantages of chain drive over belt drive.

3. A wheel has 48 teeth and a circular pitch of 24mm. Find

(a) Pitch circle diameter (b) Diametral pitch.

4. Write three applications of gear trains.

5. Define the following terms related to governor. (a) Stability (b) Hunting.

6. Define the following terms related to flywheel.

(a) Coefficient of fluctuation of speed (b) Coefficient of fluctuation of energy

7. State the function of clutch

8. Write three materials used for brake linings.

9. Classify the cams

10. Define the following terms related to cams (a) Base circle (b) Dwell.

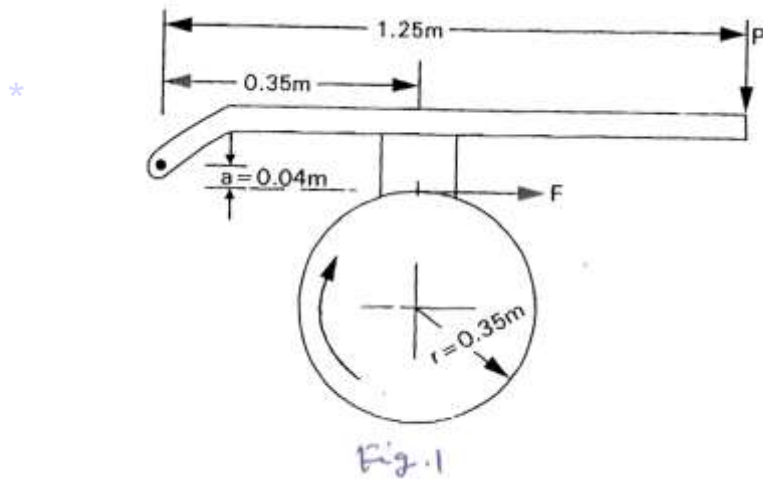
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PART-B

10X5=50

- Instructions** : *
1. Answer any **Five** questions.
 2. Each question carries **ten** marks.

11. A flat belt 8mm thick and 100mm wide transmits power between two pulleys, running at 1600 m/min. The mass of the belt is 0.92 kg/m length. The angle of lap on the smaller pulley is 165° and $\mu = 0.3$. The maximum permissible stress in the belt is 2 N/mm^2 . Find the maximum power transmitted.
12. A three speed sliding gear box of a motor car is required to give speed ratio of 4:1, 2.5:1 and 1.5:1 for the first, second and third gear respectively. Diametral pitch of all gears is 0.3 and the centre distance between mating gears is 70mm. Find suitable number of teeth for various gears, if the number of teeth on pinion is 14.
13. (a) Explain working of epicyclic gear train with a neat sketch.
(b) Two pulleys 500mm and 250mm are connected by flat belt. Central distance between them is 1.5m. Find the angle of contact for (a) Open belt drive
(b) Crossed belt drive.
14. A porter governor has equal arms each 250mm long and pivoted on the axis rotation. Each ball has a mass of 5kg can the mass of the central load on the sleeve is 15kg. The radius of rotation of the ball is 150mm when the governor begins to lift and 200mm when the governor is at maximum speed. Find the minimum and maximum speeds of the governor.
15. (a) Calculate the change in height of watt governor when its speed changes from 60 RPM and 61 RPM.
(b) Draw the displacement diagram for uniform velocity of cam follower from following data:
Out stroke during 120° of cam rotation.
Dwell for the next 30° of cam rotation.
Return stroke during 120° of cam rotation
Dwell for the remaining 90° of cam rotation.
The stroke of the follower is 30mm
16. Explain the working of single plate clutch with the help of neat sketch.
17. A single block brake is shown in figure1. The coefficient of friction between friction lining and the drum is 0.4. If the drum diameter is 0.7m, what operating force is required to sustain a braking torque of 200 Nm, if the direction of rotation is clockwise?



18. Draw the profile of cam operating a knife edge follower from the following data:

- i. Lifts the follower through 40mm during 60° rotation with SHM
 - ii. The follower remains at rest for the next 45° of rotation of the cam.
 - iii. The follower then descends to its original position during 90° rotation with SHM.
 - iv. The follower remains at rest for remaining part of rotation of the revolution
- The least diameter of the cam is 50mm, the axis of knife edge follower passes through the axis of the cam shaft.

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