Roll No. Total No. of Pages : 02

Total No. of Questions: 09

B.Tech.(ME) (2012 Onwards) (Sem.-3)

THEORY OF MACHINES-I

Subject Code: BTME-302

M.Code: 59112

Time: 3 Hrs. Max. Marks: 60

INSTRUCTION TO CANDIDATES:

- SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
- 2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
- 3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Write briefly:

- a. Define Kinematic link.
- b. What is compounded kinematic chain?
- c. Why the Ackerman steering gear mechanism is preferred to the Davis steering gear mechanism?
- d. What is 'Initial Tension in a belt'?
- e. Why a roller follower is preferred to that of a knife-edged follower?
- f. Write the types of friction.
- g. Define Coefficient of Fluctuation of Energy.
- h. Write the Classification of Governors.
- i. What is breaking capacity?
- i. Write the function of tangent cam profile.



SECTION-B

- 2. What are straight line mechanisms? Describe one type of exact straight line motion mechanism with the help of a sketch.
- 3. Discuss briefly the various types of belts used for the transmission of power.
- 4. The mass of flywheel of an engine is 6.5 tonnes and the radius of gyration is 1.8 meters. It is found from the turning moment diagram that the fluctuation of energy is 56 kN-m. If the mean speed of the engine is 120 r.p.m, find the maximum and minimum speeds.
- 5. What is the function of a flywheel? How does it differ from that of a governor?
- 6. Write short note on coefficient of insensitiveness of governors.

SECTION-C

- 7. What is the significance of degrees of freedom of a kinematic chain when it functions as a mechanism? Give examples.
- 8. A cam is to give the following motion to a knife-edged follower:
 - a. Outstroke during 60° of cam rotation;
 - b. Dwell for the next 30° of cam rotation;
 - c. Return stroke during next 60° of cam rotation, and
 - d. Dwell for the remaining 210° of cam rotation.
- 9. The stroke of the follower is 40 mm and the minimum radius of the cam is 50 mm. The follower moves with uniform velocity during both the outstroke and return strokes. Draw the profile of the cam when
 - a. The axis of the follower passes through the axis of the cam shaft, and
 - b. The axis of the follower is offset by 20 mm from the axis of the cam shaft. Discuss the controlling force and stability of a governor and show that the stability of a governor ndepends on the slope of the curve connecting the controlling force (F_C) and radius of rotation (r) and the value (F_C/r) .

NOTE: Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.

2 M-59112 (S2)-185