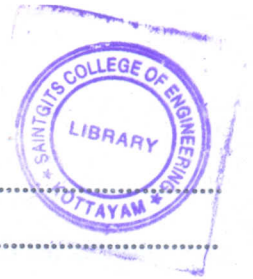


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Reg. No.....

Name.....



B.TECH. DEGREE EXAMINATION, NOVEMBER 2014

Fifth Semester

Branch : Mechanical Engineering

THEORY OF MACHINES-II (M)

(Old Scheme—Supplementary/Mercy Chance)

(Prior to 2010 Admissions)

Time : Three Hours

Maximum : 100 Marks

Part A

Answer all questions.

Each question carries 4 marks.

1. What is a free body diagram ?
2. Define dynamic force analysis.
3. What are Goremors ?
4. Draw the sketch of a flywheel.
5. Define centre of percussion.
6. What is "reversed" effective force ?
7. List the applications of gyroscopic stabilization.
8. Why are epicyclic trains important ?
9. Write a short note on classification of followers ?
10. What are convex cams ?

(10 × 4 = 40 marks)

Part B

Answer all questions.

Each full question carries 12 marks.

11. Derive an expression for displacement, velocity and acceleration of the piston of a reciprocating engine in terms of crank radius, connecting rod length and crank angle ' θ '.

Or

12. Explain the dynamic force analysis of four bar chain. Discuss how to take into account, inertia forces.

Turn over

13. Discuss all the terminology of governors. With neat sketch, explain spring controlled governors of gravity type.

Or

14. The arms of a porter governor are 31.25 cm long and are pivoted on the axis of rotation. Mass of each ball is 7.5 kg. and the central load is 45 kg. Determine the equilibrium speed corresponding to radii of 20 cm. and 25 cm.
15. Explain the energy saved in a flywheel. Discuss all aspects of application of flywheel to a punching press.

Or

16. Discuss the conditions of dynamic equivalence of two systems. Explain centre of percussion and Kinetic equivalence of the systems. Give a practical example.
17. Explain gyroscopic applied torque and reaction torque. Explain which one is more significant as regards the reaction on the bearing of a shaft on which spinning disc is rotating.

Or

18. A small high speed ship is driven by a turbine, rotor of which has a moment of inertia of 20 kgm^2 and is running at 3000 r.p.m. in clockwise direction, when viewed from the bar. The ship is speeding at 72 km/hr. taking a right turn round a curve of 600 m. radius. Determine gyroscopic couple applied to the ship and its effects.
19. Explain the construction of cam profile for simple harmonic motion to the roller follower of the cam. Also derive expression for minimum velocity and maximum acceleration of the follower.

Or

20. A dwell-rise-dwell cam has a rise of 3.75 cm in 150 degrees of cam rotation. The motion to the follower is constant velocity or uniform displacement. Plot and discuss the displacement, velocity and accelerations of the follower for rotational speed of 300 r.p.m.

(5 × 12 = 60 marks)

