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Total No. of Pages : 02

Total No. of Questions : 18

B.Tech. (ME) (2012 Onwards) (Sem.-4)

**THEORY OF MACHINES – II**

Subject Code : BTME-402

M.Code : 59130

Time : 3 Hrs.

Max. Marks : 60

**INSTRUCTIONS TO CANDIDATES :**

1. 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****Write briefly :**

- Q1. Draw the diagram of a body experiencing two force system, when (1) Body not in equilibrium (2) Body in equilibrium
- Q2. What do you mean by compound pendulum?
- Q3. Write the expression for balancing a single rotating mass.
- Q4. Explain the term 'Partial balancing of primary force'?
- Q5. Show pressure angle of a gear with the help of a diagram.
- Q6. Give two advantages of a Cycloidal gear profile.
- Q7. Draw diagram of reverted gear train.
- Q8. With the help of diagram, differentiate between spinning and precession of a gyroscope.
- Q9. What is the meaning of dimensional synthesis in a mechanism?
- Q10. Write about dedendum of a gear.

### SECTION-B

- Q11. Explain the static force analysis of a Journal bearing considering frictional forces.
- Q12. Write the expression for Correction Couple of a connecting rod of an engine.
- Q13. Write the derivation to obtain the expression for variation in tractive effort of an engine.
- Q14. Derive expression for minimum number of teeth on pinion to avoid interference with wheel.
- Q15. Write in detail about three position synthesis for four bar mechanism.

### SECTION-C

- Q16. The number of teeth on each of the two equal spur gears in mesh is 40. The teeth have  $20^\circ$  involute profile and the module is 6mm. If the arc of contact is 1.75 times the circular pitch, find the addendum.
- Q17. An epicyclic gear train consists of a sunwheel S, a stationary internal gear E and three identical planet wheels P carried on a star-shaped planet carrier C. The size of different toothed wheels are such that the planet C rotates at  $\frac{1}{5}$  of the speed of the sunwheel S. The minimum number of teeth on any wheel is 16. Determine the number of teeth on different wheels of the train.
- Q18. Explain the Gyroscopic effect on the stability of two wheel vehicle while taking a turn.

**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.**