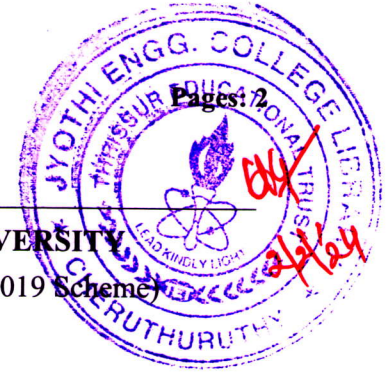


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Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
B.Tech Degree S6 (S, FE) Examination January 2024 (2019 Scheme)

Course Code: MET352

Course Name: AUTOMOBILE ENGINEERING

Max. Marks: 100

Duration: 3 Hours

PART A

Answer all questions, each carries 3 marks.

Marks

- 1 Write any three frame sections used in automobile. Also write its advantages. (3)
- 2 What do you mean by double declutching? How it is used during higher to lower and lower to higher gear shift? (3)
- 3 Write any three functions of suspension system (3)
- 4 Write the advantages and dis-advantages of Non-independent suspension. (3)
- 5 Draw a neat labelled diagram of internal expanding drum brake. Also define braking efficiency. (3)
- 6 Write short notes on servo assistance. (3)
- 7 List out the functions of (i) Fly wheel (ii) cylinder liner (iii) piston pin (3)
- 8 Write any three advantages of super capacitors. (3)
- 9 What do you mean by after flow flake and base drag? (3)
- 10 Why do we need to improve aerodynamics in car? (3)

PART B

Answer any one full question from each module, each carries 14 marks.

Module I

- 11 With neat figure explain the construction, working, advantages, dis-advantages and applications of fully automatic centrifugal clutch. (14)

OR

- 12 a) With neat figure explain the working of synchromesh gear box. (7)
- b) With neat figure explain (i) over drive (ii) Epicyclic gear box (7)

Module II

- 13 With neat figure explain any two types of rear suspension system used in automobiles. Also draw a neat labelled diagram of hydrogen suspension system. (14)

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- 14 a) With neat figure explain the working of telescopic shock absorber. Also write its advantages. (7)
- b) With neat figure explain (i) Roll centres (ii) Roll axis and (iii) Roll height. Also explain how roll centre is determined in short swing arm suspension. (7)

Module III

- 15 a) Derive the expression for mean lining pressure and heat generation during braking operation. (7)
- b) Explain the working, advantages and dis-advantages of regenerative braking system. (7)

OR

- 16 a) Derive an expression for brake applied for rear wheels. (7)
- b) With neat figure explain the working of ABS. Also write its advantages. (7)

Module IV

- 17 a) With neat figure explain Re-circulating ball nut and lever type steering gear box. (7)
- b) Explain (i) super charging (ii) Turbo charger. (7)

OR

- 18 a) With neat figure explain EV architecture. Also write any four requirements of EV chasis. (7)
- b) With neat figures explain (i) camber (ii) King pin inclination (iii) caster (iv) toe-in and toe-out. (7)

Module V

- 19 a) What do you mean by aerodynamic lift? Also discuss the effects of exposed wheel air flow pattern and partial enclosed wheel air flow pattern on aerodynamic lift control. (7)
- b) What do you mean by aerodynamic drag? Also discuss the effects of (i) bonnet slope and wind screen rake, (ii) roof and side panel chamfering on car body drag reduction. (7)

OR

- 20 a) Discuss the following (i) Aerofoil lift and drag (ii) vehicle lift (7)
- b) What do you mean by after body drag? Also discuss about notchback drag, fastback drag and hatch back drag in after body drag. (7)
