

Code : 021724

B.Tech 7th Semester Exam., 2019

AUTOMOTIVE MECHANICS

Time : 3 hours

Full Marks : 70

Instructions :

- (i) The marks are indicated in the right-hand margin.
- (ii) There are **NINE** questions in this paper.
- (iii) Attempt **FIVE** questions in all.
- (iv) Question No. 1 is compulsory.

1. Choose the correct option of the following
(any seven) : 2×7=14

- (a) Which among the following is a hatchback car?
 - (i) Ford Fusion
 - (ii) Hyundai i20
 - (iii) Volkswagen Vento
 - (iv) Volvo S60

20AK/517

(Turn Over)

(2)

(b) The chassis in which engine is mounted completely inside the driver's cabin is called

- (i) conventional control chassis
- (ii) semi-forward control chassis
- (iii) full forward control chassis
- (iv) None of the above

(c) Which of the following diverts the power at right angles towards the driving wheels?

- (i) Final drive
- (ii) Torque tube
- (iii) Transfer case
- (iv) Differential

(d) In four-wheel drive there is/are

- (i) no live axle
- (ii) one live axle
- (iii) two live axles
- (iv) one dead axle

20AK/517

(Continued)

- (e) The tilting of the front wheels away from the vertical is called
- (i) caster
 - (ii) camber
 - (iii) toe-in
 - (iv) toe-out
- (f) Which of the following brakes can never become self locking?
- (i) Band brake
 - (ii) Block brake
 - (iii) Disk brake
 - (iv) All of the above
- (g) Which of the following factors is not related to the effect of independent front suspension?
- (i) Elimination of gyroscopic couples
 - (ii) Reducing tyre wear
 - (iii) Reducing the unsprung masses
 - (iv) None of the above

- (h) During braking, the push rod directly operates
- (i) compensating port
 - (ii) primary seal
 - (iii) residual pressure valve
 - (iv) piston
- (i) The type of reflector used for automobile head lamp is
- (i) spherical
 - (ii) parabolic
 - (iii) hyperbolic
 - (iv) symmetric
- (j) EGR system is used to reduce
- (i) HC
 - (ii) CO
 - (iii) PM
 - (iv) NO_x

2. (a) What are carburettors? Discuss the working principle of a typical carburettor used in SI vehicle. In the carburettor of an automotive engine, the venturi depression is found to be 102 cm of water. The diameter of the jet is 1 mm, coefficient of the discharge for fuel is 0.65 and specific gravity of fuel is 0.78. Calculate the rate of flow of the fuel through the jet. 1+3+4=8
- (b) What are various systems of engine lubrication? With the help of neat sketch, discuss the working of dry sump lubrication system. 1+5=6
3. (a) Describe the working principle of a torque converter. Discuss the advantage and disadvantage of it. 4
- (b) A sliding mesh type of gear box with three forward speed as 5.5 : 1, 8.8 : 1 and 16.5 : 1, and reverse 19.8 : 1 respectively. The permanent speed reduction is 5.5 : 1 at the rear axle. Assume that the smallest pinion has not less than 15 teeth and speed of the layshaft is half that of the main driving shaft. Calculate the number of teeth on various gears. 10

4. (a) Explain each term—*toe-in*, *camber*, *caster* and *steering axis inclination*. What are the effects of each on the steering characteristics of a vehicle? 10
- (b) Discuss in detail the Ackermann steering mechanism. 4
5. (a) Write a short note on 'tandem master cylinder'. 4
- (b) Derive the expressions to obtain reactions on front and rear wheels when brakes are applied on (i) rear wheel only and (ii) all the four wheels. 10
6. (a) With the help of a mathematical model, discuss sprung and unsprung masses in an automobile. 4
- (b) With the help of neat sketch, discuss leaf springs, coil springs, torsion bar, air spring and rubber spring. 10
7. (a) Give a detailed account of the battery ignition system. Illustrate your answer with neat sketch. 8
- (b) Describe briefly various types of electronic ignition systems. 6

8. (a) Discuss the driving technique used for driving in traffic, at night and in slippery conditions. 8
- (b) Describe in detail step-by-step procedure to inspect an old car. 6
9. (a) What are the main constituents of exhaust emissions from diesel engines? Give the possible routes of their formation. 8
- (b) With the help of diagram, discuss the working of a '3-way catalytic converters'. 6

<https://www.akubihar.com>

Whatsapp @ 9300930012

Send your old paper & get 10/-

अपने पुराने पेपर्स भेजे और 10 रुपये पायें,

Paytm or Google Pay से