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15162

3 Hours / 100 Marks

Seat No.

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Instructions : (1) All Questions are *compulsory*.

(2) Answer each next main Question on a new page.

(3) Illustrate your answers with neat sketches wherever necessary.

(4) Figures to the right indicate full marks.

(5) Assume suitable data, if necessary.

Marks

1. (A) Attempt any THREE :

12

- (a) List out different types of rear axles used in vehicle and draw a neat sketch of any one rear axle.
- (b) Write down advantages and disadvantages of pneumatic brakes.
- (c) Draw the sketch showing vehicle body construction.
- (d) Classify automobile vehicles on the basis of fuel used, fitting of engine, suspension system and wheels.

(B) Attempt any ONE :

6

- (a) Draw and explain layout of automobile vehicle with components and their functions.
- (b) Explain construction and working of synchromesh gear box.

2. Attempt any FOUR :

16

- (a) Explain construction and working of propeller shaft.
- (b) Define : (i) Caster (ii) Camber (iii) Toe-in (iv) Toe-out

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- (c) Explain construction and working of telescopic shock absorber.
- (d) Differentiate between sheet metal cutting and forming process in car body manufacturing.
- (e) Write down design procedure for a simple fixture used in milling.
- (f) List down design considerations for jig & steps to be followed.

3. Attempt any FOUR :

16

- (a) Draw a diagram of epicyclic gear box and its advantages.
- (b) Explain construction and working of power steering used in vehicle.
- (c) Describe the working of McPherson Suspension System.
- (d) Explain any two manufacturing processes used for production of connecting rod.
- (e) State the applications of different types of jigs.

4. (A) Attempt any THREE of the following :

12

- (a) Explain construction and working of diaphragm spring type clutch.
- (b) Draw a neat sketch of disc brake and explain its working.
- (c) Enlist any four objectives of vehicle suspension system.
- (d) Explain forging and heat treatment process for production of crank shaft.

(B) Attempt any ONE of the following :

6

- (a) List the various location devices. Explain any one with the help of suitable sketch.
- (b) Explain the terms with respect to leaf spring :
 - (i) hardening
 - (ii) pre-stressing
 - (iii) tempering

5. Attempt any FOUR of the following : 16

- (a) State the necessity of clutch and draw the sketch of coil spring type single plate clutch.
- (b) Explain construction and working of hydraulic brake system.
- (c) Explain construction and working of rigid axle of vehicle.
- (d) Write down casting and machining process used in cylinder block manufacturing.
- (e) List the essentials of milling fixture and advantage.
- (f) Describe heat treatment, lapping process used in crank shaft manufacturing.

6. Attempt any FOUR of the following : 16

- (a) List the more common types of clamps used in fixtures. Explain any one with a neat sketch.
 - (b) Describe construction and working of wishbone and trailing link suspension system.
 - (c) Explain working principle of rack and pinion steering gear.
 - (d) Differentiate between rear axle and front axle.
 - (e) Write down the various types of milling fixtures used in milling process and explain any one with a sketch.
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