

B.E./B.TECH. Degree Examination, December 2020

Fifth Semester

OE18003 ELEMENTS OF MECHANICAL COMPONENTS

(Regulation 2018)

Time: Three hours

Maximum: 80 Marks

Answer **ALL** questions

PART A - (8 X 2 = 16 marks)

1. Softer constituent of a composite is
(a) Matrix (b) Reinforcement (c) Both are of equal strength (d) Cannot define
2. 5/2-way single solenoid valve has:
(a) 2 ports 2 positions (b) 5 ports 2 positions (c) 5 ports 5 positions (d) 2 ports 5 positions
3. A one-way valve that lets air into the reservoir of a compressor, but does not let it out, is a
(a) Check valve (b) Receiver valve (c) Control valve (d) Three-way valve
4. What is not the part of drilling machine?
(a) Tool holder (b) Spindle (c) Table (d) Cross slide
5. Justify hollow shaft is better than solid shaft if priority is cost cutting.
6. Why should the tight side of the belt be at the bottom side of the pulley?
7. Why is hydraulic power especially useful when performing heavy work?
8. Why Muffler is essential in the pneumatic system?

PART B - (4 X16 = 64 marks)

09. (a) (i) Classify and explain the mechanical components that support the shaft (8) and provide the free rotation of the shaft.
- (ii) With an example explain the various factors affecting the selection of (8) materials for design a product.

(OR)

- (b) (i) List out the types of coupling. Identify and explain the coupling used (8) to connect two parallel shafts whose axes are at a small distance apart.
- (ii) Define factor of safety and list the importance of FOS, why factor of (8) safety should be greater than one?
10. (a) Choose the best drive to transmit power over a comparatively long distance. (16) With the neat sketch explain that drive with its classification.

(OR)

- (b) (i) Classify the Gear and Choose the suitable gear for the following case **(12)**
to transfer power and explain the same with an example
- Shafts are intersecting
 - Shafts are parallel
 - Transfer rotary motion to linear motion
- (ii) Discuss relative merits and demerits of belt and chain drive. **(4)**
11. (a) (i) How is the pumping action in positive displacement pumps **(12)**
accomplished? **(4)**.
Choose the suitable rotary pump to handle the thick liquids such as
chocolate, adhesive, etc. and explain it with neat sketch. **(8)**
- (ii) List five applications of fluid power in the automotive industry and **(4)**
explain anyone.

(OR)

- (b) (i) How to control the excess pressure in the hydraulic system in case of **(8)**
any blockage? List the device used to control the pressure and explain
any one device
- (ii) What hydraulic device creates a torque that can rotate a shaft? Explain **(8)**
any two such device with neat sketch.
12. (a) (i) Identify and explain the components required to generate fluid power **(8)**
using air and draw the circuit of the same.
- (ii) What pneumatic device creates a force that can push or pull a load? **(8)**
Explain any two such device with neat sketch.

(OR)

- (b) (i) Which machine tool is suitable for performing operation for **(8)**
cylindrical parts? Sketch and Explain the various components of that
machine.
- (ii) List out the various types of linear motion generator, Identify and **(8)**
Explain the linear motion generator used in the Automobile Steering
with neat sketch.