Reg. No. : | | | | | | | | | | |

Question Paper Code: 56701

B.E./B.Tech. DEGREE EXAMINATION, DEC 2020

Sixth Semester

Mechanical Engineering

15UME601-DESIGN OF TRANSMISSION SYSTEMS

(Regulation 2015)

(Design data book permitted)

Duration: 1.15 hrs Maximum: 30 Marks

PART A - (6 x 1 = 6 Marks)

(Answer any six of the following questions)

1. Which one of the following is a positive drive? CO1-R

   (a) Crossed flat belt drive (b) Rope drive (c) V-belt drive (d) Chain drive

2. The wire rope make contact at CO1-R

   (a) Bottom of the grooved pulley (b) Side of the grooved pulley

   (c) Side and bottom of the grooved pulley (d) Anywhere in the grooved pulley

3. The size of gear is usually specified by CO2-R

   (a) Pressure angle (b) Pitch circle diameter

   (c) Circular pitch (d) diametrical pitch

4. A helical gear has normal module of 6 mm. What is the transverse module if helix angle is 25^{o}? CO2-R

   (a) 4.95 mm (b) 500 mm (c) 5.43 mm (d) 6.62 mm

5. When bevel gears having equal teeth and equal pitch angles connect two shafts whose axes intersect at right angles the they are known as CO3-R

   (a) Angular bevel gear (b) Crown bevel gear

   (c) Internal bevel gear (d) Mitre gear

6. What is the shortest distance between worm gear and axes of the worm for a worm gear pair designated as 2/40/10/8? CO3-R

(a) 50 mm (b) 200 mm (c) 320 mm (d) 360 mm

7. In the two stage gear box how may shaft will be there CO4-R

(a) 3 (b) 2 (c) 1 (d) 4

8. Name the series in which speeds of multispeed gear box are arranged CO4-R

(a) Arithmetic progression (b) Geometric progression

(c) Logarithmic progression (d) Harmonic progression

9. In case of multiple disc clutch if n_1 are the number of discs on the driving shaft and n_2 are the number of discs on the driven shaft, then the number of pairs of contacting surfaces will be CO5-R

(a) $n_1 + n_2$ (b) $n_1 + n_2 - 1$ (c) $n_1 + n_2 + 1$ (d) None of these

10. The cam follower extensively used in air-craft engines is CO5-R

(a) Knife edge follower (b) Flat faced follower

(c) Spherical faced follower (d) Roller follower

PART – B (3 x 8= 24 Marks)

(Answer any three of the following questions)

11. A compressor receives power from a motor rated at 30 kW at 22 rpm by means of V belts. The pulley diameters are 300 mm and 750 mm. Centre distance is 1.4 m. Design the belt drive. CO1-App (8)

12. Design spur gear to transmit 1.5 kW at 1440 rpm from an electric motor to an air compressor running at 720 rpm. Assume both the gear and pinion is made with Cast iron grade 25 material. The expected life of the gears are 10000Hours CO2-App (8)

13. Design a bevel gear drive to transmit 10 kW at 1440 rpm. Take Gear ratio as 3, material for pinion and gear – C45 steel and expected life as 10,000 hrs CO3-C (8)

14. Design the layout of a gear box for a milling machine to provide twelve output speeds ranging from 160 rpm to 2000 rpm. Input speed 1440 rpm Choose standard speed ratio and construct the structural diagram and kinematic arrangement. Show the number of teeth for all the gears in the kinematic arrangement. CO4-C (8)

15.	An automotive single plate clutch consists of two pairs of contacting surfaces. The inner and outer radii of friction plate are 120mm and 250mm respectively. The coefficient of friction is 0.25 and the total axial force is 15kN. Calculate the power transmitting capacity of the clutch plate at 500rpm using (i) uniform pressure theory (ii) uniform wear theory.	CO5-App	(8)