ME - Design of Mechanical Drives

P. Pages : 2

Time : Four Hours

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4672

GUG/W/16/6620

Max. Marks : 80

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Notes :
1. All questions carry equal marks.
2. Answer Q. 1 or Q. 2, Q. 3 or Q. 4, Q. 5 or Q. 6, and Q. 7 or Q. 8.
3. Assume suitable data wherever necessary.
4. Illustrate your answers wherever necessary with the help of neat sketches.
5. Use of DDB By B.D. Shiwalkar is permitted.

1. a) Design a flexible bush-pin coupling to transmit the power of 35KW between two line shafts. The speed of shaft is 800 rpm. **14**

   b) Select a deep groove ball bearing for the radial load of 5kN and axial load of 1.5 kN. The speed of the shaft is 1200 rpm. The desirable life of the bearing should be 35000 Hours. **6**

OR

2. a) State various applications of flywheel. **4**

   b) Design the flywheel for the single cylinder four stroke I.C. Engine for the power of 85KW and speed of 900 rpm. The work done during the power stroke is 1.38 times the work done during whole cycle. The fluctuation in the speed is to be limited to 8% of mean speed. **16**

3. a) State the advantages of V-belt drive over flat belt drive. **4**

   b) Design the V-belt drive to transmit the power of 12KW between two line shafts. The driving line shaft is rotating at 900rpm. The driven shaft should rotate at 300 rpm. The drive is subjected to light shock load and it is operating for 8 hrs/day. **16**

OR

4. a) Explain the chordal action in case of chain drive. **4**

   b) Design the chain drive to transmit the power of 11 KW from electric motor to the line shaft. The electric motor speed is 750 rpm and line shaft is rotating at 250 rpm. This drive is subjected to medium shock load and it is operating in single shift. **16**

5. a) Compare spur & Helical gear drive. **4**

   b) Design the spur gear drive to transmit the power of 25KW between two line shafts. The driving line shaft is rotating at 1000 rpm and driven shaft should rotate at 500 rpm. The drive is subjected to light shock loads and it is operating for 24 hrs/day. **16**

OR

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6. a) Compare worm gear drive with Bevel gear drive. **4**

   b) Design a worm gear drive to transmit the power of 7.5 KW from electric motor to line shaft. The motor speed is 1500 rpm and line shaft has to rotate at 50 rpm. The drive is operating for 8 hrs/day. **16**

7. a) Compare single plate clutch with multiple plate clutch. **4**

   b) Explain uniform pressure & uniform wear condition in case of clutches. **6**

   c) Design a cone clutch to transmit the power of 20 KW at 800 rpm between I.C. Engine & line shaft. **10**

OR

8. a) State the applications of wire ropes. **4**

   b) Design wire rope, sheave & Drum to lift the load of 90kN through the height of 50 meters with the maximum velocity of 35 m/min. This speed is to be achieved within 6 seconds. Assume suitable data. **16**

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