Unit-III Worksheet

C3.1 A conical pivot bearing supports a vertical shaft of 200 mm diameter. It is subjected to a load of 30 KN. The angle of the cone is 120º and the coefficient of friction is 0.025.Find the power lost in friction when the speed is 140 r.p.m., assuming 1. Uniform pressure; and 2. Uniform wear.

C3.2 A conical pivot supports a load of 20 kN, the cone angle is 120º and the intensity of normal pressure is not to exceed 0.3 N/mm^2. The external diameter is twice the internal diameter. Find the outer and inner radii of the bearing surface. If the shaft rotates at 200 r.p.m. and the coefficient of friction is 0.1, find the power absorbed in friction. Assume uniform pressure.

1. The force of friction acts in a direction _____ to the direction of motion of object.

(a) Same (b)Opposite (c)Perpendicular (d)Downwards

Ans: b

2. The force of friction depends upon

(a) Nature of surface of contact (b) Material of objects in contact

(c) Both 'a' and 'b' (d) None of the above

Ans:c

3. The ratio of the limiting force of friction (F) to the normal reaction (R) is known as

(a) Coefficient of friction (b) Force of friction (c) Angle of friction

Ans: a

4. The coefficient of friction (μ) is equal to

(a) TanΦ (b) SinΦ (c) CotΦ (d) CosΦ

Where Φ = angle of friction

Ans:a

5. When the two surfaces in contact have a very thin layer of lubricant in between them, it is known as

(a) Solid friction (b) Rolling friction (c) Greasy friction (d) Film friction

Ans: d

6. The force of friction (F) is equal to

(a) μR/2 (b) μR (c) 2μR (d) μR/3

Ans: b

7. According to uniform wear theory, frictional torque transmitted in flat collar bearing is given as

a. 2/3 [μ W (R1 - R2)] b. 1/2 [μ W (R1 + R2)]

c. 2/3 μ W [(R1 + R2) / (R1 - R2)] d. none of the above

Ans: b

8. Which of the following condition is true for uniform wear theory?

a. p = constant b. p/r = constant c. p.r = constant d. none of the above

Ans: c

9. The frictional resistance (Tr) offered by the ring in flat pivot bearing is given as

a. 2 π μ p r δr b. 2 π μ p r2 δr c. 2/3 π μ p r δr d. 2/3 π μ p r2 δr

Ans: a

10. Which theory is used to determine safe design of bearings?

a. Uniform wear theory b. Uniform pressure theory

c. both a. and b. d. none of the above

Ans: b

11. Frictional torque transmitted by uniform wear theory is more than torque transmitted by uniform pressure theory

a. True b. False

Ans: b

12. Which of the following statements is/are true?

a. Friction clutches give positive engagement

b. Square shaped jaws in jaw clutch are driven in one direction

c. Spiral shaped jaws in jaw clutch are driven in one direction

d. All the above statements are true

Ans: c

13. Which clutch is known as wet clutch?

a. Single plate clutch b. multi plate clutch

c. both a. and b. d. none of the above

Ans: b

14. In centrifugal clutches, when is the contact between shoe friction lining and surface of drum observed?

a. When centrifugal force is less than spring force

b. When centrifugal force is equal to spring force

c. When centrifugal force is greater than spring force

d. None of the above

Ans: b

15. The brakes commonly used in railway trains is

a) shoe brake b) band brake

c) band and block brake d) internal expanding brake

Ans: a

16. When brakes are applied to all the four wheels of a moving car, the distance travelled by the

car before it is brought to rest, will be

a) maximum b) minimum c) equal d) none of the mentioned

Ans: b

17. Which of the following is an absorption type dynamometer?

a) prony brake dynamometer b) epicyclic-train dynamometer

c) torsion dynamometer d) none of the mentioned

Ans: a

18. The transmission type of dynamometer is a

a) prony brake dynamometer b) epicyclic-train dynamometer

c) torsion dynamometer d) none of the mentioned

Ans: c

19. The material used for the brake lining should have

a) It should have low wear rate. b) It should have high heat resistance.

c) It should have high heat dissipation capacity. d) All of the mentioned

Ans: d

20. The capacity of a brake depends upon

a) The unit pressure between the braking surfaces,

b) The coefficient of friction between the braking surfaces,

c) The peripheral velocity of the brake drum

d) All of the mentioned

Ans: d