RRB TECHNICAL EXAM QUESTIONS

Fluid Mechanics

1. A single acting reciprocating pump, running at 60 r.p.m, delivers 0.01 m2/sec of water. The area of the piston is 0.05m2 and stroke length is 40 cm. Then theoretical discharge of the pump will be
(a) 0.015 m3/sec (b) 0.02 m3/sec
(c) 0.025 m3/sec (d) 0.03 m3/sec
Ans:- B

2.B. In question (A), the co-efficient of discharge would be

(a) 0.9 (b) 0.8 (c) 0.6 (d) 0.5

Ans:- D

3. In question (A), the slip of the pump would be

(a) 0.02 m3/sec (b) 0.01 m3/sec

(c) 0.005 m3/sec (d) 0.003 m3/sec

Ans:- B

4.The possibility of negative slip in reciprocating pump is when

(a) delivery pipe is short (b) suction pipe is long

(c) pump is running at high speed (d) all of the above

Ans:- D

5. The slip in the reciprocating pump will be negative if

(a) Qth > Qact (b) Qth < Qact

(c) Qth = Qact (d) none of the above

Ans:- B

6. The power required to drive a single acting reciprocating pump is equal to

(a) w.A.L.N / 4500 (b) w.A.L.N.(hs + hd)4500

(c) A.L.N. (hs + hd)/4500 (d) w.L.N/4500

where w = specific weight of water

Ans:- B

7. The rate of flow of water through a double acting reciprocating pump is equal to

(a) A.L.N /60 (b) 2 AL.N/60 (c) A.L.N./2Ã—60 (d) 3 A.L.N./60

Ans:- B

8. The rate of flow of water through a single acting reciprocating pump is equal to

(a) A.L.N /60 (b) 2 AL.N/60 (c) A.L.N./2Ã—60 (d) 3 A.L.N./60

Ans:- A

9. The pump, which works on the principle of water hammer, is known as

(a) centrifugal pump (b) reciprocating pump

(c) hydraulic ram (d) none of the above

Ans:- C

10. The pump which raises water without any external power for its operation, is known as

(a) centrifugal pump (b) reciprocating pump

(c) hydraulic ram (d) hydraulic intensifier

Ans:- C

11. The power at the shaft of a centrifugal pump is 100 KW, and the power available at the impeller is 900 KW. If water horse power is 720 KW, then overall efficiency of the centrifugal pump will be

(a) 90% (b) 80% (c) 75% (d) 72%

Ans:- D

12. In the question (A), the manometric efficiency would be

(a) 90% (b) 80% (c) 75% (d) 72%

Ans:- B

13. In question (A), the mechanical efficiency would be

(a) 90% (b) 80% (c) 75% (d) 72%

Ans:- A

14. The term W.Q.Hm / (75 S.H.P) for a centrifugal pump is known as

(a) mechanical efficiency (b) manometric efficiency

(c) overall efficiency (d) none of the above

Ans:- C

15. If a circular chamber is introduced between the casing and the impeller, then casing is known as

(a) vortex casing (b) volute casing

(c) casing with guide blades (d) none of the above

Ans:- A

16. The rotating part of a turbine is known as

(a) Impeller (b) Guide mechanism

(c) Runner (d) None of the above

Ans:- A

17. The rotating part of a turbine is known as

(a) Impeller (b) Guide mechanism

(c) Runner (d) None of the above

Ans:- C

18. In case of Kaplan turbine, velocity of flow at inlet is

(a) less than that at outlet

(b) more than that at outlet

(c) equal of that at outlet

(d) none of the above

Ans:- C

19.Francis turbine is a

(a) radially inward flow turbine

(b) radially outward flow turbine

(c) axial flow turbine

(d) none of the above

Ans:- A

20. The main advantage of the draft-tube is to convert

(a) pressure energy into kinetic energy

(b) kinetic energy into pressure energy

(c) pressure energy into electrical energy

(d) none of the above

Ans:- B

21. The pressure at the exist of the runner of a reaction turbine is generally

(a) more than atmospheric pressure

(b) equal to atmospheric pressure

(c) less than atmospheric pressure

(d) none of the above

Ans:- C

22.In case of draft tube, are of cross-section of the draft tube

(a) increases from inlet to outlet

(b) decreases from inlet to outlet

(c) remains constant

(d) none of the above

Ans:- A

23. Draft tube is used in case of

(a) Pelton turbine (b) Pelton and Francis turbine

(c) Kaplan and Pelton turbine (d) Francis and Kaplan turbine

Ans:- D

24.The pressure energy goes on changing into kinetic energy in case of

(a) Pelton turbine (b) Francis turbine

(c) Kaplan turbine (d) Francis and Kaplan

Ans:- D

25. A turbine is having specific speed of 400. Then the turbine would be

(a) Kaplan turbine (b) Francis turbine

(c) Pelton turbine (d) None of the above

Ans:- A

26.A turbine is having specific speed as 100. Then the turbine would be

(a) Kaplan turbine (b) Francis turbine

(c) Pelton turbine (d) Steam turbine

Ans:- B

27. The axial flow reaction turbine, in which vanes are fixed to the hub and they are not adjustable, is known as

(a) Kaplan turbine (b) Francis turbine

(c) propeller turbine (d) Pelton turbine

Ans:- C

28.In case reaction turbine, the total head at the inlet of a turbine consists of

(a) pressure energy and kinetic energy

(b) kinetic energy only

(c) pressure energy only

(d) none of the above

Ans:- A

29. In case of reaction turbine, the total head at the inlet of a turbine consists of

(a) pressure energy and kinetic energy

(b) kinetic energy only

(c) pressure energy only

(d) none of the above

Ans:- B

30. Kaplan turbine is a

(a) reaction turbine (b) impulse turbine

(c) radial flow turbine (d) none of the above

Ans:- A

31. Francis turbine is a

(a) reaction turbine (b) impulse turbine

(c) axial flow turbine (d) none of the above

Ans:- A

32. Pelton turbine is a

(a) reaction turbine (b) radial inward flow turbine

(c) impulse turbine (d) axial flow turbine

Ans:- C

33. The relation between overall efficiency. mechanical efficiency and hydraulic efficiency is given by

(a) h0 = hmech / hhyd (b) h0 = hmech / hhyd

(c) h0 = 1.0 / (hmech Ã— hhyd) (d) h0 = hhyd / hmech

Ans:- B

34.The ratio of power at the shaft of a turbine to the power supplied by water at inlet of a turbine is known as

(a) hydraulic efficiency (b) mechanical efficiency

(c) overall efficiency (d) none of the above

Ans:- C

35. The ratio of power available at the shaft of a turbine to the power developed by the runner of the turbine is known as

(a) hydraulic efficiency (b) mechanical efficiency

(c) overall efficiency (d) volumetric efficiency

Ans:- B

36. A jet water of area of cross-section 20 cm2, having a velocity of 20 m/sec strikes a curved plate which is moving with a velocity of 10 m/sec in the direction of the jet. The jet leaves the vane at an angle of 600 to the direction of motion of vane at outlet as shown in Fig. Z3. The relative velocity at inlet will be

(a) 20 m/sec (b) 10 m/sec (c) 15 m/sec (d) 16 m/sec

Ans:- B

37. The velocity of whirl at inlet in the question (A), will be

(a) 20 m/sec (b) 16 m/sec (c) 15 m/sec (d) 10 m/sec

Ans:- A

38. In the FIG Z3, angle f will be

(a) 300 (b) 450 (c) 600 (d) 750

Ans:- C

39. In Fig Z2 shows the velocity triangles triangles at inlet and outlet of a turbine, V1 represents the absolute velocity at inlet and u1 represents vane velocity at inlet. The relative velocity at inlet is represented by

(a) length BD (b) Length AD

(c) length CD (d) length CB

Ans:- D

40. In Fig. Z2 the velocity of whirl at inlet is given by

(a) length DB (b) length AD

(c) length CD (d) length CB

Ans:- B

41. In fig. Z2, angle BAC is known as

(a) vane angle at inlet (b) nozzle angle at inlet

(c) vane angle at outlet (d) none of the above

Ans:- B

42. In fig. Z2, angle BCD is known as

(a) vane angle at inlet (b) nozzle angle at inlet

(c) vane angle at outlet (d) none of the above

Ans:- A

43. A jet water of area 40 cm2 moving with a velocity of 10 m/sec strikes normally a fixed vertical plate. The force exerted by the jet on the plate in the direction of jet will be

(a) 500 N (b) 400 N (c) 300 N (d) 200 N

Ans:- B

44. Pump is a machine which converts

(a) hydraulic energy to mechanical energy

(b) mechanical energy to hydraulic energy

(c) mechanical energy to electrical energy

(d) none of the above

Ans:- B