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DEPARTMENT OF MECHANICAL ENGINEERING

THIRD YEAR (TY)

SCHEME: I

SEMESTER: VI

**NAME OF SUBJECT: INDUSTRIAL HYDRUALICS
AND PNEUMATICS**

Subject Code: 22655

**UNIT WISE MULTIPLE CHOICE
QUESTIONS BANK**



Question Bank for Multiple Choice Questions

Program: Diploma in Mechanical Engineering	Program Code: - ME
Scheme: -I	Semester: - VI
Course: - Industrial Hydraulic and Pneumatics	Course Code: - 22655

01 – Introduction to Industrial Hydraulic and Pneumatics	Marks: -15
Content of Chapter: - 1.1 General layout of oil Hydraulic Maintain Pneumatic system. 1.2 Applications, Merits, limitations and oil hydraulic systems and Pneumatics systems 1.3 Properties of fluids, ISO and SAE grades of oi. 1.4 ISO Symbols used in Hydraulic, Pneumatic system 1.5 Hazard and Safety in Industrial hydraulics and pneumatics	

1. Heavy lifting work is often accomplished by shifting fluids in big machines. The power system of such machines can be described as
- a. Reciprocating
 - b. Hybrid
 - c. hydraulic
 - d. Pneumatic

Answer: C

Explanation: The power system of heavy and big machines can be described by hydraulic systems and heavy lifting work is often accomplished by shifting fluids in big machines.

2. The scientific principle that makes hydraulic systems possible is
- a. Pascal's principal
 - b. Boyle's law
 - c. Bernoulli's principle
 - d. the fluid flow principle

Answer: a

Explanation: Pascal's principle is the basis of hydraulic system which states that the water exerts pressure in all direction.

3. Pneumatic and other power systems can support three kinds of motion; they are
- a. Linear, reciprocating, and random motion
 - b. Linear, flowing, and rotary motion
 - c. Linear, zigzag, and spiral motion
 - d. Linear, reciprocating, and rotary motion

Answer: d

Explanation: Pneumatic systems are the systems that control the process where the motion is in air and can support linear, reciprocating, and rotary motion.

4. A single acting cylinder can be pressurized externally from one direction only.

- a) True
- b) False

Answer: a

Explanation: Pressure variation is possible only if the force is acting from one direction if the force will be acting from multiple directions, then the force cancellation is also possible.

5. **A one-way valve that lets air into the reservoir of a compressor, but doesn't let it out, is a**
- a. Check valve
 - b. Receiver valve
 - c. Control valve
 - d. Three-way valve

Answer: a

Explanation: Check valve is a one-way valve that lets air into the reservoir of a compressor, but doesn't let it out as the name indicates it allows air to enter as it has one entrance.

6. **Series circuits work on both hydraulic and pneumatic actuators.**
- a. True
 - b. False

Answer: a

Explanation: Series circuits are the circuits where the components are connected in series and the component is called lumped component and work for both hydraulic and pneumatic error detectors.

7. **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

Answer: b

Explanation: 5/2-way single solenoid valve is the valve in which the valve is in the shape of solenoid has 5 ports equally spaced and 2 flow positions.

8. **The converts the compressed air energy into mechanical energy in the form of linearmovement in one direction only.**
- a. Piston cylinders
 - b. double acting cylinders
 - c. Single acting cylinders
 - d. Hydraulic pumps

Answer: c

Explanation: Single acting cylinders converts the compressed air energy into mechanical energy in the form of linear movement in one direction only.

9. **A restricts air flow.**
- a. Throttle valve
 - b. Shuttle valve
 - c. Directional control valve
 - d. Single acting cylinder

Answer: a

Explanation: Air valve is restricted by the valve it allows only that entry as desired and throttle valve restricts the airflow.

10. When the piston area of the cylinder is connected to the atmosphere, the piston of the single-acting cylinder is pressed by the spring to the

- a. Cylinder center
- b. Cylinder down
- c. Cylinder bottom
- d. Cylinder upper

Answer: a

Explanation: Piston is the part in the cylinder that is used to create the pressure difference and in case of single-acting cylinder it is pressed by the spring to the cylinder center.

11. Fluid power circuits use schematic drawings to:

- a. Simplify component function details
- b. Make it so only trained persons can understand the functions
- c. Make the drawing look impressive
- d. Make untrained person to understand

Answer: a

Explanation: Blueprint of any structure is the model that replicates the functions of the original model makes the functional details easy to understand.

12. A pneumatic symbol is:

- a. Different from a hydraulic symbol used for the same function
- b. The same as a hydraulic symbol used for the same function
- c. Not to be compared to a hydraulic symbol used for the same function
- d. None of the mentioned

Answer: a

Explanation: The representation for hydraulic and pneumatic systems are different and for creating the easy readability and symbols for both used for the same function.

13. Pneumatic systems usually do not exceed:

- a. 1 hp
- b. 1 to 2 hp
- c. 2 to 3 hp
- d. 4 to 5 hp

Answer: a

Explanation: Pneumatic systems are the systems in which the control action is mainly controlling the flow of air and mostly do not exceed 1 hp where hp is the horse power unit of power.

14. Most hydraulic circuits:

- a. Operate from a central hydraulic power unit
- b. Use air-over-oil power units
- c. Have a dedicated power unit

- d. Does not have dedicated power unit

Answer: a

Explanation: Hydraulic circuits are the circuits where the operation involves conversion of the hydel power into the electrical energy so that it can be stored and used and these operate from a central hydraulic power unit.

15. Hydraulic and pneumatic circuits:

- a. Perform the same way for all functions
- b. Perform differently for all functions
- c. Perform the same with some exceptions
- d. Does not perform all the function

Answer: c

Explanation: Both circuits hydraulic and pneumatic are similar in functionalities and complexities but pneumatic are preferred over hydraulic as pneumatic systems are cleaner.

16. The lubricator in a pneumatic circuit is the:

- a. First element in line
- b. Second element in line
- c. Last element in line
- d. Third element in line

Answer: c

Explanation: The lubricator is the fluid that is used to lubricate the parts of the pneumatic circuits to reduce the friction and lubricator in a pneumatic circuit is the last element.

17. Series circuits work on both hydraulic and pneumatic actuators.

- a. True
- b. False

Answer: b

Explanation: Series circuits are the circuits that in which the elements are connected in series and do not work on both hydraulic and pneumatic actuators.

18. When comparing first cost of hydraulic systems to pneumatic systems, generally they are:

- a. More expensive to purchase
- b. Less expensive to purchase
- c. Cost is same
- d. Cost is not required

Answer: b

Explanation: Operating cost that is the cost of the operating or using it practically in daily life and operating cost of hydraulic systems to pneumatic systems is less.

19. When comparing operating cost of hydraulic systems to pneumatic systems, generally they are.

- a. More expensive to operate
- b. Less expensive to operate
- c. Cost is same to operate
- d. Cost is not required

Answer: b

Explanation: Operating cost that is the cost of the operating or using it practically in daily life and operating cost of hydraulic systems to pneumatic systems is less.

20. The most common hydraulic fluid is:

- a. Mineral oil
- b. Synthetic fluid
- c. Water
- d. Gel

Answer: c

Explanation: Hydraulic fluid is the fluid that is causing conversion process and used in control action which is chemically inert and readily available.

21. The cylinder having the larger diameter is called cylinder.

- a. Slave
- b. Master
- c. Cage
- d. Pump

Answer: b

Explanation: The cylinder with the larger diameter is called the master cylinder. The hydraulic press consists of 2 cylinders. These are classified as master and slave cylinder depending on their diameters.

22. A is a storage reservoir under pressure where a liquid is held under pressure.

- a. Hydraulic accumulator
- b. Hydraulic crane
- c. Hydraulic gear
- d. Hydraulic pump

Answer: a

Explanation: A hydraulic accumulator is a storage reservoir under pressure where a liquid is stored under pressure. The fluid is mostly a non-compressible hydraulic fluid. This pressure is usually applied by an external source.

23. The most frequently used accumulator type is

- a. Liquid accumulator
- b. Solid accumulator
- c. Compressed gas accumulator
- d. Plasma accumulator

Answer: c

Explanation: The most common accumulator type is compressed gas accumulator. It is also known as hydro-pneumatic accumulator. They have a wide range of application.

24. The first accumulators for Armstrong's hydraulic dock machinery were which is placed raised.

- a. Oil towers
- b. gas towers
- c. water towers

- d. plasma towers

Answer: c

Explanation: The first accumulators for Armstrong's hydraulic dock machinery were raised water towers. Water was pumped to a tank at the top of these towers by steam pumps. When dock machinery required hydraulic power, the hydrostatic head of the water's height above ground provided the necessary pressure.

25. is the simplest form of an accumulator.

- a. Air filled
- b. oil filled
- c. water filled
- d. gas filled

Answer: a

Explanation: Air filled accumulator is one of the simplest accumulators. It is an enclosed space. It is filled with air.

26. invented the compressed air accumulator.

- a. Reynold
- b. Braman
- c. Pascal
- d. Jean Mercier

Answer: d

Explanation: The compressed air accumulator was invented by Jean Mercier. It was invented for use in variable pitch propellers. It is the most commonly used accumulator.

27. The inert gas used in gas compressed accumulator is usually

- a. Sulphur
- b. Nitrogen
- c. Oxygen
- d. Carbon dioxide

Answer: b

Explanation: The inert gas used in a gas compressed accumulator is usually nitrogen. It generates the required compressive force for the liquid. The volume of this gas is inversely proportional to the pressure exerted by this gas.

28. Spring type accumulator works on the principle of

- a. Bernouille's law
- b. Charles' law
- c. Hooke's law³
- d. Pascal's law

Answer: c

Explanation: Spring type accumulator works on the principle of Hooke's law. Hooke's law states that the magnitude of the force exerted by a spring is linearly proportional to its length change. Hence, as the spring compresses, the force it exerts on the fluid is accelerated linearly.

29. A gear pump uses

- a) Petrochemical pumps
- b) meshing of gears
- c) Froth pumps
- d) Airlift pumps

Answer: b

Explanation: A gear pump uses meshing of gears. This meshing is done to pump fluid by displacement. Gear pumps are widely used in chemical installations.

30. A pump that has low suction and moderate discharge of liquid is called

- a. Airlift Pump
- b. Vacuum pump
- c. Turbine pump
- d. Draft tub

Answer: a

Explanation: A pump that has low suction and moderate discharge of liquid is called airlift pump. It plays an essential role in pumping high pressure fluids.

31. The most common pump used for hydraulic fluid power application is

- a. Centrifugal pumps
- b. Gear pump
- c. Froth pumps
- d. Airlift pump

Answer: b

Explanation: The most common pump used for hydraulic fluid power application is gear pump. A gear pump uses meshing of gears. This meshing is done to pump fluid by displacement. Gear pumps are widely used in chemical installations.

32. The main function of gear pumps are to

- a) Transfer speed
- b) Transfer pressure
- c) Transfer temperature
- d) Transfer energy

Answer: d

Explanation: The primary objective of a gear pump is to transfer energy. Gear pump is a turbo machinery. Turbo machines are machines that transfer energy between a rotor and a fluid, including both turbines and compressors. It is a mechanical device.

33. Centrifugal pumps transfer energy from

- a) Rotor to fluid
- b) Fluid to rotor
- c) Draft to rotor
- d) Rotor to draft

Answer: a

Explanation: Centrifugal pumps transfer energy from rotor to fluid. The primary objective of a centrifugal pump is to transfer energy. Centrifugal pump is a turbo machinery.

34. Gear pumps are mainly used in chemical installations because they pump

- a. High viscosity fluids
- b. High density fluids
- c. High pressure fluids
- d. High temperature fluid

Answer: a

Explanation: Gear pumps are mainly used in chemical installations because they pump high viscosity fluids. They use two external spur gears for this purpose.

35. Gear pumps convert rotational kinetic energy to hydrodynamic energy.

- a. True
- b. False

Answer: a

Explanation: Gear pumps are used to transport fluids. They transport fluids by conversion of energies. Gear pumps transport fluids by converting rotational Kinetic energy to hydrodynamic energy.

36. The injection pumps used in most diesel engines can create up to

- a. 300 psi
- b. 3000 psi
- c. 30000 psi
- d. 3 psi

Answer: c

Explanation: The injection pumps used in most diesel engines can create up to 30000 psi. It needs to maintain at this pressure in order to operate the fuel injectors.

37. A pneumatic sewage ejector includes a tank for holding

- a. Fluid sewage
- b. horizontally sewage
- c. Axial sewage
- d. Radial sewage

Answer: a

Explanation: A pneumatic sewage ejector includes a tank for holding fluid sewage.

38. Gear pumps are used to transport

- a. Pressure
- b. Speed
- c. Power
- d. Fluid

Answer: d

Explanation: Gear pumps are used to transport fluids. They transport fluids by conversion of energies. A gear pump uses meshing of gears. This meshing is done to pump fluid by displacement. Gear pumps are widely used in chemical installations.

39. Centrifugal pumps transport fluids by converting

- a. Kinetic energy to hydrodynamic energy
- b. Hydrodynamic energy to kinetic energy
- c. Mechanical energy to kinetic energy
- d. Mechanical energy to Hydrodynamic energy

Answer: a

Explanation: Centrifugal pumps are used to transport fluids. They transport fluids by conversion of energies. Centrifugal pumps transport fluids by converting rotational Kinetic energy to hydrodynamic energy.

40. Gear pumps are

- a. Tangential flow pumps
- b. Positive displacement pumps
- c. Negative displacement pumps
- d. Radial pumps

Answer: a

Explanation: Gear pumps are positive displacement pumps or fixed displacement pumps. This means that they pump at a constant amount of fluid each revolution.

41. The lubricator in a pneumatic circuit is the:

- a. First element in line
- b. Second element in line
- c. Last element in line
- d. Third element in line

Answer: Option 3 - Last element in line

42. Most hydraulic circuits:

- a. Operate from a central hydraulic power unit
- b. Use air-over-oil power units
- c. Have a dedicated power unit
- d. Does not have dedicated power unit

Answer: Option 1 - Operate from a central hydraulic power unit

43. Hydraulic and pneumatic circuits:

- a. Perform the same way for all functions
- b. Perform differently for all functions
- c. Perform the same with some exceptions
- d. Does not perform all the function

44. The scientific principle that makes hydraulic systems possible is

- a. Pascal's principle
- b. Boyle's law
- c. Bernoulli's principle
- d. The fluid flow principle

45. The most common hydraulic fluid is:

- a. Mineral oil
- b. Synthetic fluid

- c. Water
- d. Gel

46. One-way valve that lets air into the reservoir of a compressor, but doesn't let it out, is a

- a. Check valve
- b. Receiver valve
- c. Control valve
- d. Three-way valve

47. 5/2-way single solenoid valve has:

- a. 2 ports 2 positions
- b. 5 ports 2 positions
- c. ports 5 positions
- d. 2 ports 5 positions

48. Theconverts the compressed air energy into mechanical energy in the form of linear movement in one direction only.

- a. Piston cylinders
- b. Double acting cylinders
- c. Single acting cylinders
- d. Hydraulic pumps

49. Heavy lifting work is often accomplished by shifting fluids in big machines. The power system of such machines can be described as

- a. reciprocating
- b. Pneumatic
- c. Hydraulic
- d. Hybrid

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Question Bank for Multiple Choice Questions

Program: Diploma in Mechanical Engineering	Program Code: - ME
Scheme: -I	Semester: - VI
Course: - Industrial Hydraulic and Pneumatics	Course Code: - 22655

02 – Pumps and Actuators	Marks: -15
Content of Chapter: - 2.1 Classification of Pumps 2.2 Construction and working of Gear, Vane, Screw, piston pumps (axial and radial) 2.3 Performance characteristics and Selection of Pumps 2.4 Classification of Hydraulic and Pneumatic actuators 2.5 Construction and working of Linear and rotary actuators	

1. Gear pumps are _____
- Tangential flow pumps
 - Positive displacement pumps
 - Negative displacement pumps
 - Radial pumps

Answer: a

Explanation: Gear pumps are positive displacement pumps or fixed displacement pumps. This means that they pump a constant amount of fluid each revolution.

2. The lubricator in a pneumatic circuit is the:
- First element in line
 - Second element in line
 - Last element in line
 - Third element in line

Answer: Option 3 - Last element in line

3. Most hydraulic circuits:

- Operate from a central hydraulic power unit
- Use air-over-oil power units
- Have a dedicated power unit
- Does not have dedicated power unit

Answer: Option 1 - Operate from a central hydraulic power unit

4. The _____ converts the compressed air energy into mechanical energy in the form of linear movement in one direction only.

- a. Piston cylinders
- b. Double acting cylinders
- c. Single acting cylinders
- d. Hydraulic pumps

Answer: Option 3 - Single acting cylinders

5. A one-way valve that lets air into the reservoir of a compressor, but doesn't let it out, is a

- a. Check valve
- b. Receiver valve
- c. Control valve
- d. Three-way valve

Answer: Option 1 - Check valve

6. Assertion (A): Pneumatic actuators are not as messy as hydraulic ones. Reason (R): Pneumatics suffer from leakages and inherent inaccuracies.

- 1. Both A and R are true and R is correct explanation of A
- 2. Both A and R are true but R is not correct explanation of A
- 3. A is true but R is false
- 4. A is false but R is true

Answer: Option 2 - Both A and R are true but R is not correct explanation of A

7. A single acting cylinder can be pressurized externally from one direction only.

- a. True
- b. False

Answer: a. True

8. A pneumatic symbol is:

- a. Different from a hydraulic symbol used for the same function
- b. The same as a hydraulic symbol used for the same function
- c. Not to be compared to a hydraulic symbol used for the same function
- d. None of the mentioned

Answer: Option 1 - Different from a hydraulic symbol used for the same function

9. Which of the following logic valve is known as shuttle valve?

- a. OR gate
- b. AND gate
- c. NOR gate
- d. NAND

Answer: a. OR gate

10. In pneumatic systems, AND gate is also known as

- a. check valve
- b. shuttle valve
- c. dual pressure valve
- d. none of the above

Answer: c. dual pressure valve

11. What is a pressure sequence valve?

- a. it is a combination of adjustable pressure relief valve and directional control valve
- b. it is a combination of nonadjustable pressure relief valve and directional control valve
- c. it is a combination of adjustable pressure reducing valve and check valve
- d. it is a combination of adjustable pressure reducing valve and flow control valve

ANSWER: a. it is a combination of adjustable pressure relief valve and directional control valve

12. Which of the following is used to sense the initial and final positions of a piston rod?

- a. lever operated direction control valve
- b. limit switch
- c. roller lever valve
- d. all the above

ANSWER: all the above

13. Which valve gets activated only in one direction that is forward or backward movement of the piston rod?

- a. roller lever valve
- b. idle roller lever valve
- c. both a and b
- d. none of the above

ANSWER: b. idle roller lever valve

14. Which valve gets activated only in one direction that is forward or backward movement of the piston rod?

- a. roller lever valve
- b. idle roller lever valve
- c. both a and b
- d. none of the above

ANSWER: b. idle roller lever valve

15. Which numbers are used to denote retraction of a piston rod?

- a. even numbers
- b. odd numbers
- c. both even and odd numbers
- d. none of the above

ANSWER: b. odd numbers

16. Which of the following is an element of time delay valve?

- a. flow control valve
- b. direction control valve
- c. both a and b
- d. none of the above

ANSWER: c. both a and b

17. How is proximity switch differentiated from limit switch?

- a. proximity switch is activated when moving parts have physical contact with it
- b. proximity switch is activated when non-moving parts have physical contact
- c. proximity switch is activated when moving parts are close to it
- d. none of the above

ANSWER: c. proximity switch is activated when moving parts are close to it

18. Which of the following factors is/are considered while selecting a compressor?

- a. type of oil filter required
- b. volumetric efficiency
- c. viscosity of the liquids used
- d. all of the above

ANSWER: volumetric efficiency

19. Which of the following systems generate more energy when used in industrial applications?

- a. hydraulic systems
- b. pneumatic systems
- c. both systems generate same energy

d. cannot say

ANSWER: a. hydraulic systems

20. Which type of compressor requires a reservoir for compressed air and why?

- a. rotary compressor to avoid pulsating effect
- b. reciprocating compressor to avoid pulsating effect
- c. both rotary and reciprocating compressors to avoid pulsating effect
- d. none of the above

ANSWER: b. reciprocating compressor to avoid pulsating effect

21. Which of the following factors is considered while selecting a compressor?

- a. type of oil filter required
- b. volumetric efficiency
- c. viscosity of the liquids used
- d. all the above

ANSWER: b. volumetric efficiency

22. Which of the following is a component used in air generation system?

- a. pressure switch
- b. pressure gauge
- c. drier
- d. intercooler

ANSWER: c. drier

23. Where is an intercooler connected in a two stage compressor?

- a. intercooler is connected after the two-stage compressor
- b. intercooler is connected between the two stages of the compressor
- c. intercooler is connected before the two-stage compressor
- d. none of the above

ANSWER: b. intercooler is connected between the two stages of the compressor

24. Select the correct order of process occurring in pneumatic system

a.



order 1



order 2

b.



order 3

c.

d. none of the above

ANSWER: Option: c.

25. What is difference between regulator and pressure switch?

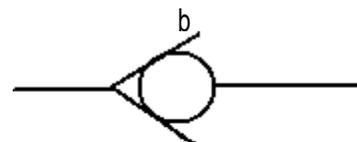
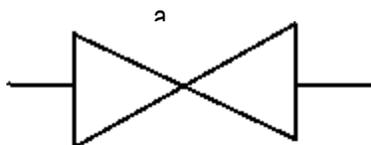
- a. regulator operates at set value pressure while pressure switch operates with slight fluctuation in pressure
- b. pressure switch operates at set value pressure while regulator operates with slight fluctuation in pressure

ANSWER: a. regulator operates at set value pressure while pressure switch operates with slight fluctuation in pressure

26. Select the correct standard symbols for the hydraulic elements given below.

Hydraulic elements

- 1. Check valve
 - 2. Hydraulic motor
 - 3. Shut-off valve
 - 4. pneumatic motor
- Standard symbols



standard symbol 2

- a. 1-C 2-A 3-B 4-D
- b. 1-A 2-C 3-B 4-D
- c. 1-B 2-D 3-A 4-C
- d. 1-A 2-D 3-B 4-C



standard symbol 4



standard symbol 3

ANSWER: c. 1-B 2-D 3-A 4-C

27. Which valve is also known as memory valve?

- a. single pilot signal valve
- b. double pilot signal valve
- c. roller lever valve
- d. logic valve

ANSWER: b. double pilot signal valve

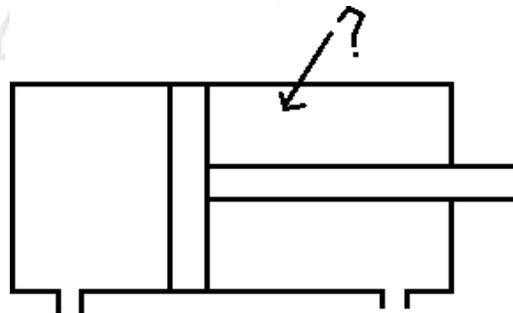
28. Why is pilot operated check valve used in clamping operation?

- a. to reduce leakage in spool valve
- b. to avoid decrease in pressure during clamping
- c. both a and b
- d. none of the above

ANSWER: c. both a and b

29. Which area does the part shown below indicate?

- a. rod area
- b. full bore area
- c. annulus area
- d. none of the above



ANSWER: c. annulus area

30. Which of the following statements is true?

- a. Meter-in feed circuits have speed control in two directions
- b. Standard block feed circuits have speed control in two directions
- c. Tank line feed control systems have speed control only in one direction
- d. all the above

ANSWER: b. Standard block feed circuits have speed control in two directions

31. Leakage in rotary chucks can be compensated by

- a. flow control valve
- b. pilot operated check valve
- c. accumulator
- d. all the above

ANSWER: c.
accumulator

32. Which valve is used to block the accumulator from the system for the purpose of safety?

- a. pilot valve
- b. needle valve
- c. detent valve
- d. all the above

ANSWER: b. needle
valve

33. Cylinder has a bore area of 300 cm² and velocity of 180 cm/min. Calculate the flowrate of a pump

- a. 55 l/min
- b. 50 l/min
- c. 54 l/min
- d. none of the
above

ANSWER: c. 54
l/min

34. Which of the following statements is true, for two pumps used in circuit when initially fast operation is performed to reach a job and feeding operation is done at a slow speed?

- a. initially to reach a job, a tool must be connected to a pump of high discharge and low pressure
- b. initially to reach a job, a tool must be connected to a pump of low discharge and high pressure
- c. for feeding operation low discharge low pressure pump is required
- d. none of the above

ANSWER: a. initially to reach a job, a tool must be connected to a pump of high discharge and low pressure

35. Which of the following pumps saves more power?

- a. single pump
- b. double pump
- c. single and double pump use same amount of power
- d. none of the above

ANSWER: b. double pump

36. Which of the following statements are true for accumulator used in hydraulic systems?

1. Accumulator stores fluid with pressure
2. Accumulator stores fluid without any pressure
3. Accumulator stores compressible liquid
4. spring is used as an external source to keep the fluid under hydraulic pressure

- a. 1, 3 and 4
- b. 2 and 3
- c. 1 and 4
- d. 2, 3 and 4

ANSWER: c. 1 and 4

37. Which of the following is a gas charged accumulator?

- a. bladder type
- b. spring loaded accumulator
- c. weighted accumulator
- d. all the above

ANSWER: a. bladder type

38. How is pressure of fluid under piston calculated in a weighted accumulator?

- a. pressure of fluid = (weight added / piston area)
- b. pressure of fluid = (piston area / weight added)
- c. pressure of fluid = (weight added / piston force)
- d. pressure of fluid = (piston force / weight added) **ANSWER:** a.

pressure of fluid = (weight added / piston area)

39. Which of the following gas is used in gas charged accumulator?

- a. oxygen
- b. nitrogen
- c. carbon dioxide
- d. all the above

ANSWER: b.
nitrogen

40. Accumulator used in gas charged accumulator is

- a. hydraulic
- b. pneumatic
- c. hydro pneumatic

d. none of the above

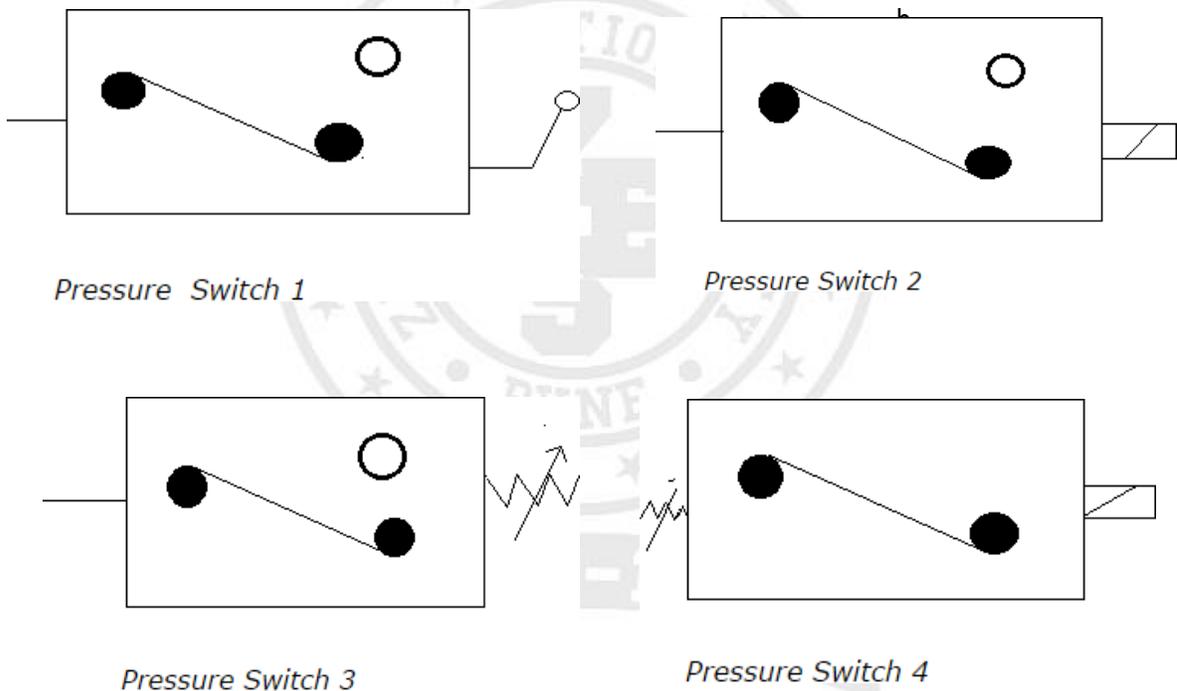
ANSWER: c. hydropneumatic

41. What is the function of pressure switch?

- a. pressure switch is used to start a motor
- b. pressure switch is used to stop a motor
- c. pressure switch is used to deenergize a solenoid
- d. all the above

ANSWER: d. all the above

42. Which symbol represents a pressure switch?



ANSWER: Option: c.

43. What is the function of unloading relief valve and can it be used as an accessory for accumulators?

- a. unloading relief valve is used to charge the accumulator by a pump when accumulator pressure falls below the set value and it can be used as an accessory.
- b. unloading relief valve is used to charge the accumulator by a pump when accumulator pressure falls below the set value but is not used as an accessory
- c. unloading relief valve is used to charge the accumulator by a pump when accumulator pressure rises above the set value but is not used as an accessory
- d. unloading relief valve is used to charge the accumulator by a pump when accumulator pressure rises above the set value and is used as an accessory

ANSWER: a. unloading relief valve is used to charge the accumulator by a pump when accumulator pressure falls below the set value and it can be used as an accessory.

44. What is the function of a flow control valve?

- a. flow control valve changes the direction of oil flow
- b. flow control valve can adjust the flow rate of hydraulic oil
- c. both a and b
- d. none of the above

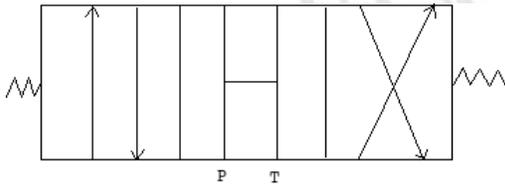
ANSWER: b. flow control valve can adjust the flow rate of hydraulic oil

45. What does the numbers in 4/2 valve mean?

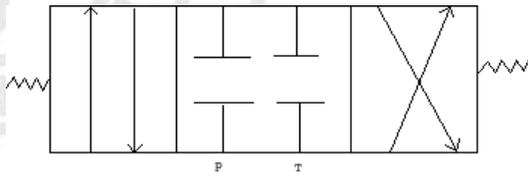
- a. 4 positions and 2 ways
- b. 4 ways and 2 positions
- c. none of the above

ANSWER: b. 4 ways and 2 positions

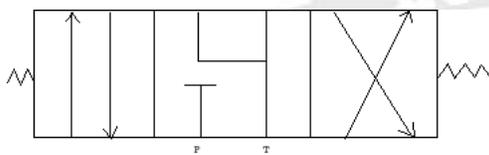
46. Which of the following circuits shows tandem connection?



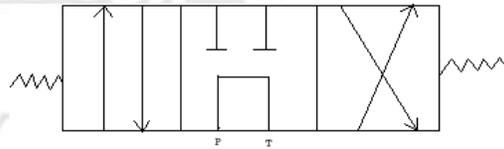
Direction Control Valve 1



Direction Control Valve 2



Direction Control Valve 3



Direction Control Valve 4

ANSWER: Option: d

47. Which type of solenoid has more chances of coil failure?

- a. AC solenoid
- b. DC solenoid
- c. both AC and DC solenoids
- d. none of the above

ANSWER: a. AC solenoid

48. Which stage in two stage direction control valve is solenoid operated?

- a. main stage direction control valve
- b. pilot stage direction control valve
- c. both stages in two stage direction control are solenoid operated
- d. none of the above

ANSWER: b. pilot stage direction control valve

49. Check valve is a type of

- a. pressure reducing valve
- b. pressure relief valve
- c. directional control valve
- d. none of the above

ANSWER: c. directional control valve

50. A pressure relief valve can be

- a. direct operated
- b. pilot operated
- c. solenoid operated
- d. all the above

ANSWER: d. all the above

51. Which of the following statements are true for throttle valve?

- 1. Reverse flow of fluid is not possible
 - 2. Input pressure for a throttle valve is more than output pressure
 - 3. The actuator speed can be reduced by a throttle valve
 - 4. Correct flow control valve for a particular application can be selected on the basis of pressuredrop specified
- a. 1, 2 and 3
 - b. 1, 3 and 4
 - c. 2, 3 and 4
 - d. all the above

ANSWER: c. 2, 3 and 4

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Question Bank for Multiple Choice Questions

Program: Diploma in Mechanical Engineering	Program Code: - ME
Scheme: -I	Semester: - VI
Course: - Industrial Hydraulic and Pneumatics	Course Code: - 22655

03 – Control Valves	Marks: -15
Content of Chapter: - 2.1 Classification of Control valves 2.2 Pressure control valves- relief, unloading, sequence, counter balance, pressure reducing valves 2.3 Direction control valves- Check valve, 2/2,3/2,4/2,4/3,5/2,5/3 D.C. Valves used in Hydraulics and Pneumatics 2.4 Standard center positions, Methods of actuation 2.5 Flow control valves- Non compensated, Pressure and temperature compensated	

1. A unidirectional valve that lets air into the reservoir of a mechanical device, however doesn't let it out, is a

- a. Check valve
- b. Receiver valve
- c. Control valve
- d. Three means valves

Ans: a) Check valve

2. 5/2 means single coil valve has:

- a. 2 ports a pair of positions
- b. 5 ports a pair of positions
- c. 5 ports five positions
- d. 2 ports five positions

Ans: b) five ports a pair of positions

3. What is the perform of a flow management valve?

- a. flow management valve changes the direction of oil flow

- b. flow management valve will alter the speed of flow of hydraulic oil
- c. both a and b
- d. none of the higher than

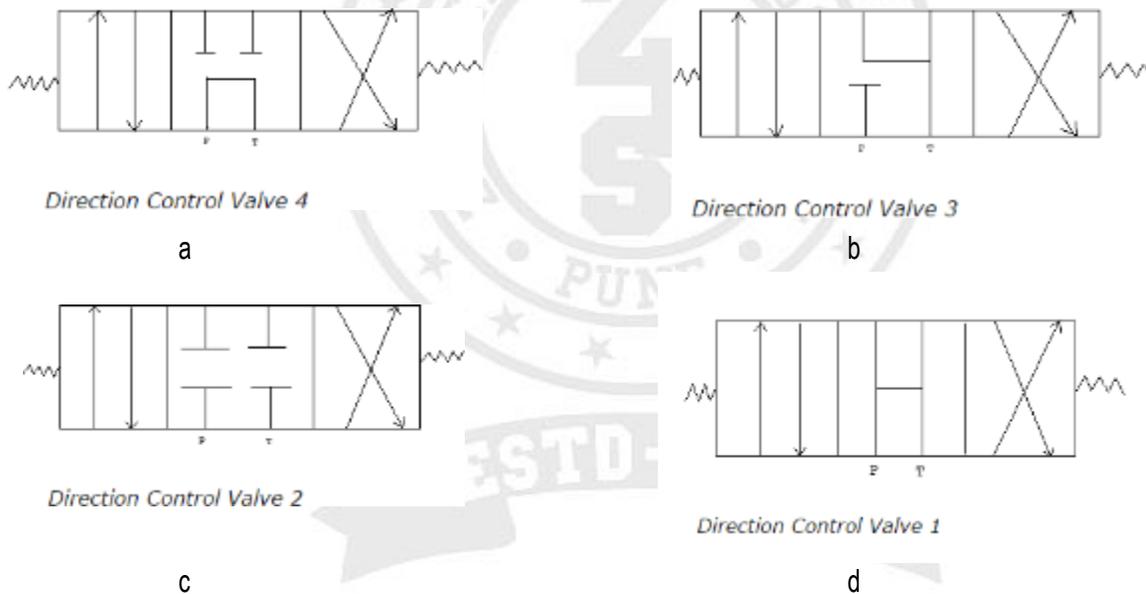
ANSWER: b. flow management valve will alter the speed of flow of hydraulic oil.

4. What will the numbers in 4/2 valve mean?

- a. Four positions and 2 ways that
- b. Four ways that and 2 position
- c. none of the higher than

ANSWER: b. Four ways that and 2 positions

5. Which of the following circuits shows tandem bicycle connection?



ANSWER: Option: d.

6. Check valve may also be known as

- a. pressure reducing valve
- b. pressure escape
- c. directional management valve
- d. none of the higher than

ANSWER: c. directional management valve

7. A pressure escape is.....operated.

- a. direct operated
- b. pilot operated
- c. solenoid operated
- d. all the higher than

ANSWER: d. all the higher than

8. Which of the following statements are correct for throttle valve?

1. Reverse flow of fluid is not potential
2. Input pressure of a throttle is quite output pressure 3. The mechanism speed will be minimized by a throttle
4. Correct FCV for hand-picked application will be selected on the premise of pressure drop such that
 - a. 1, 2 & 3
 - b. 1, 3 & 4
 - c. 2, 3 & 4
 - d. all the higher than

ANSWER: c. 2, 3 & 4

9. How is reverse flow created potential in pilot operated check valve?

- a. Spring force lifts the ball & attributable to that reverse flow created potential.
- b. Fluid pressure lifts the ball & attributable to that reverse flow created potential.
- c. Both
- d. None of the these

ANSWER: b. Fluid pressure lifts the ball thanks to that reverse flow is feasible

10. What is the distinction between Pressure escape & Pressure Reducing Valve?

- a. Pressure reducing valve is connected between pump and tank line whereas pressure escape is connected in between Direction management Valve and branch circuit
- b. Pressure relief valves are invariably ordinarily opened
- c. Pressure reducing valve is connected in between Direction management Valve and branch circuit whereas pressure relief valve is connected between pump and tank
- d. None of the these

ANSWER: c. Pressure reducing valve is connected in between Direction management Valve and branch circuit whereas pressure relief valve is connected between pump and tank

11. What is the perform of unloading escape & can it's used as an adjunct for accumulators?

- a. Unloading escape is employed to begin the accumulator by a pump once accumulator pressure goes below the bottom set price & it will be used as an adjunct.
- b. Unloading escape is employed to begin the accumulator by a pump once accumulator pressure goes below the bottom price however is won't be used as an adjunct
- c. Unloading escape is employed to begin the accumulator by a pump once accumulator pressure goes higher than the bottom price however won't be used as an adjunct
- d. Unloading escape is employed to begin the accumulator by a pump once accumulator pressure goes higher than the set price and it will be used as an adjunct

ANSWER: a. Unloading escape is employed to begin the accumulator by a pump once accumulator pressure goes below the bottom set price & it will be used as an adjunct.

12. Why is pilot operated check valve utilised in clamping operation?

- a. to reduce leak in spool valve
- b. to avoid decrease in pressure throughout clamping
- a. both a and b
- b. none of the higher than

ANSWER: c. each a and b

13. From the mentioned that isn't the strategy to actuate the Direction management Valve

- a. Push Button
- b. Solenoid Operated
- c. Pilot Operated
- d. Fixed Operated

Ans: d) mounted Operated

14. Tandem centre position is achieved during this form of Direction management Valve

- a. 4/2 Direction management Valve
- b. 4/3 Direction management Valve
- c. 3/2 Direction management Valve
- d. 5/2 Direction management Valve

Ans: b) 4/3 Direction management Valve

15. wherever Pressure paid FCV is used?

- a. to scale back the flow per modification is pressure modification
- b. to extend the flow per modification is pressure modification
- c. to stay the flow constant regardless of modification in pressure
- d. to regulate the pressure per flow

Ans: c) to stay the flow constant regardless of modification in pressure

16. The definition of split range control valves implies that they are

- a. calibrated with complementary ranges.
- b. easily re-ranged for different characteristics.
- c. equipped with quick-acting positioners.
- d. only used in sets of three.

Answer: calibrated with complementary ranges.

17. The proper “fail safe” status of a valve should always be dictated by

- a. economic savings
- b. the nature of the process
- c. the controller's tuning
- d. the controller's action (direct or reverse)

Answer: the nature of the process

20. Calculate the necessary Cv rating for a liquid service valve, given a pressure drop of 24 PSID, a specific gravity of 1.3, and a maximum flow rate of 140 GPM. Assume there will be no flashing or choked flow through the valve.

- a. 0.1319
- b. 32.58
- c. 7.583
- d. 2585

Answer: 32.58

21. When a valve is installed in a process with where the differential pressure (drop) across the valve decreases with increasing flow, the best trim characteristic to choose for the valve would be

- a. Ported
- b. Quick-opening
- c. Equal percentage
- d. Linear

Answer: Equal percentage

22. The main purpose of a control valve positioner is to

- a. Alter the fail-safe status of the valve
- b. Improve the precision of the valve
- c. Alter the characterization of the valve
- d. Increase transmitter accuracy

Answer: Improve the precision of the valve

23. The purpose of valve packing is to

- a. Help reduce cavitation in the valve trim
- b. Increase stiction
- c. Cushion the valve against harm during shipment
- d. Seal process fluid from escaping past the stem

Answer: Seal process fluid from escaping past the stem

24. An air-to-open valve assembly may be formed with which of these actuator/valve body combinations?

- a. Reverse-acting actuator, direct-acting valve body
- b. Direct-acting actuator, direct-acting valve body
- c. Direct-acting actuator, reverse-acting valve body
- d. A or C

Answer: a or c

25. Cavitation in a control valve is caused by

- a. process noise
- b. vibration in the piping
- c. pressure recovery
- d. a laminar flow regime

Answer: pressure recovery

26. Dual-ported globe valves typically enjoy the following advantage over single-ported globe valves

- a. Less actuating force required
- b. Longer service life
- c. Easier disassembly and maintenance
- d. Tighter shut-off

Answer: Less actuating force required

27. Leakage in rotary chucks can be compensated by

- a. flow control valve
- b. pilot operated check valve
- c. accumulator
- d. all the above

ANSWER: c. accumulator

28. What is the function of a pressure control valve?

- a. To control the force generated by actuators
- b. To perform two operations in sequence
- c. To control the direction of flow
- d. To avoid the development of excess of pressure

Answer: a

Explanation: The main function of the pressure control valve is to control the force generated by actuators. The other functions mentioned in the options are the functions of the Direction control valve, Sequence valve and hydraulic fuse respectively. The control valve is used to control different parameters of the fluid.

29. Which among the following fluid parameters are not controlled by the control valves?

- a. Pressure
- b. Rate of flow
- c. Speed
- d. Direction of flow

Answer:c

Explanation: Speed is not an important parameter controlled by the control valves. Control valves control the fluid parameters such as the pressure of the working fluid, Rate of flow of working fluid and direction of flow of the working fluid.

30. Pressure reducing valve is used to maintain constant reduced pressure.

- a. True
- b. False

Answer:a

Explanation: Pressure reducing valve is used to maintain constant reduced pressure in a system. It consists of a diaphragm, an adjusting screw, a spring, a conical poppet fit to the diaphragm. If the pressure of the outlet increases, the diaphragm deflects upwards due to which the conical poppet will also move upwards to close the passage of working fluid flow.

31. Once the pressure comes to normal, the diaphragm _____

- a. deflects downwards

- b. deflects upwards
- c. has no effect
- d. expands

Answer: a

Explanation: Once the pressure comes to normal, the diaphragm deflects downwards. If the pressure of the outlet increases, the diaphragm deflects upwards due to which the conical poppet will also move upwards to close the passage of working fluid flow. At normal pressure, it deflects downwards and the conical poppet moves downwards.

32. The function of the pressure relief valve is _____

- a. to open when the inlet pressure is more
- b. to control the force generated by actuators
- c. to control different parameters of the fluid
- d. to control the direction of flow

Answer: a

Explanation: The function of the pressure relief valve is that it opens when the inlet pressure which may be the system pressure or the pilot pressure becomes more than the pre-set value. In the other options, the main function of the pressure control valve is to control the force generated by actuators. The control valve is used to control different parameters of fluid by which the required specific task is completed in a proper way as desired.

33. The pressure relief valve is an important component which is required for every positive displacement pump.

- a. True
- b. False

Answer: a

Explanation: Pressure relief valve is an important component which is required for every positive displacement pump. This valve is connected to the outlet of the pump. Its main function is to release the oil back to the tank when the pressure increases beyond pre-set value.

34. What is the function of a pressure gauge?

- a. It controls the rate of flow of oil
- b. It shows the pressure reading
- c. Controls the direction of flow of oil
- d. It converts the mechanical energy to hydraulic energy

Answer: b

Explanation: The pressure gauge is used to give the pressure reading. Pressure settings are made into the pressure gauge. Without a pressure gauge, it is not possible to make the pressure relief valve settings, unloading valve settings etc.

35. What happens when the pressure increases its pre-set value?

- a. The pressure relief valve opens
- b. Deflects upwards
- c. Deflects downwards
- d. Has no effect

Answer: a

Explanation: If the pressure inside a system increases above the pre-set level, this valve opens to release the working fluid back to the reservoir tank, so that the system pressure comes to the normal value. The other mentioned options are not the correct choices.

36. What is the formula for the force of a cylinder?

- a. $F=(p*a)$
- b. $F=(p+a)$
- c. $F=(p/a)$
- d. $F=(p/ap)$

Answer:a

Explanation: The force of a cylinder is the product of the pressure of working fluid and area of the piston that is ($F=p*a$). To vary the force, we need to vary any of these two, either the pressure of working fluid or the area of the piston.

37. A gate valve is generally a poor choice for throttling fluid flow because...

- a. excessive stem leakage will result unless the gate valve is fully open or fully closed.
- b. the head loss from a throttled gate valve will result in an unacceptable reduction in system flow rate
- c. the tortuous path through a gate valve body can make flow control difficult.
- d. the turbulent flow created by a partially opened gate valve can cause extensive damage to the valve.

Answer: d

Explanation: the turbulent flow created by a partially opened gate valve can cause extensive damage to the valve.

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Question Bank for Multiple Choice Questions

Program: Diploma in Mechanical Engineering	Program Code: - ME
Scheme: -I	Semester: - VI
Course: - Industrial Hydraulic and Pneumatics	Course Code: - 22655

04 – Compressor, Pneumatic components and accessories in fluid system	Marks: -10
Content of Chapter: - 4.1 Types, construction, working principle of Reciprocating Maintain Rotary compressors 4.2 Construction, working principle of FRL unit, Dual (twin) pressure valve, Shuttle valve, Quicke exhaust valve, Time delay valve 4.3 Accessories: Oil reservoir, pipes, hoses, fittings, oil filters. air filters, seals and gaskets,intensifiers, accumulators, heat exchanger, muffler	

1. Which of the following systems generate more energy when used in industrial applications?

- a. hydraulic systems
- b. pneumatic systems
- c. both systems generate same energy
- d. cannot say

Answer: a. hydraulic systems

2. Which type of compressor requires a reservoir for compressed air and why?

- a. rotary compressor to avoid pulsating effect
- b. reciprocating compressor to avoid pulsating effect
- c. both rotary and reciprocating compressors to avoid pulsating effect
- d. none of the above

Answer: b. reciprocating compressor to avoid pulsating effect

3. Which of the following factors is considered while selecting a compressor?

- a. type of oil filter required
- b. volumetric efficiency
- c. viscosity of the liquids used
- d. all the above

Answer: b. volumetric efficiency

4. Which of the following is a component used in air generation system?

- a. pressure switch
- b. pressure gauge
- c. drier
- d. intercooler

Answer: c. drier

5. Where is an intercooler connected in a two-stage compressor?

- a. intercooler is connected after the two-stage compressor
- b. intercooler is connected between the two stages of the compressor
- c. intercooler is connected before the two-stage compressor
- d. none of the above

Answer: b. intercooler is connected between the two stages of the compressor

6. The ratio of work-done per cycle to the stroke volume of the compressor is known as.....

- a. Compressor capacity
- b. Compression ratio
- c. Compressor efficiency
- d. Mean effective pressure

Answer: D. Mean effective pressure

7. The capacity of a compression is 10 m³/minute. 10 m³/minute refers to.....

- a. Standard air
- b. Free air
- c. Compressed air
- d. Compressed air at delivery pressure

Answer: Free air

8. The multi stage compression as compared to single stage compression.....

- a. Improves volumetric efficiency for the given pressure ratio
- b. Reduces work done per kg of air
- c. Reduces cost of compressor
- d. Gives more uniform torque

Answer: E. All of the above

9. Compression efficiency is compared against.....

- a. Ideal compression
- b. adiabatic compression
- c. both isothermal and adiabatic compression
- d. Isentropic compression
- e. Isothermal compression

Answer: E. Isothermal compression

10. A rotary compressor is driven by an

- a. electric motor
- b. engine
- c. either A or B
- d. none of these

Answer: Option (c)

11. In the vane compressor, air is compressed by means of

- a. backflow from receiver only
- b. the reciprocating action of the plunger
- c. squeezing action and backflow from the receiver
- d. all of the above

Answer: Option (c)

12. The maximum delivery pressure in a rotary air compressor is

- a. 10 bar
- b. 20 bar
- c. 30 bar
- d. 50 bar

Answer: Option (a)

13. In a centrifugal compressor, the flow of air is _____ to the axis of the compressor.

- a. Parallel
- b. Perpendicular
- c. Inclined
- d. None of these

Answer: Option (b)

14. If the flow of air through the compressor is parallel to its axis, then the compressor is

- a. reciprocating compressor
- b. centrifugal compressor
- c. axial flow compressor
- d. turbo-compressor

Answer: Option (c)

- 15. compressor is a machine which is used to**
- a. lift liquid from low height to higher elevation
 - b. to store liquid
 - c. to compress liquid OR gas
 - d. none of the above

Answer: Option (c)

- 16. The compressor in which compression of air from suction pressure to delivery pressure takes place in more than one cylinder is called _____ compression.**
- a. single-acting
 - b. double acting
 - c. single stage
 - d. multi-stage

Answer: Option (d)

- 17. In hydraulic systems,**
- a. the mechanical energy is transferred to the oil and then converted into mechanical energy
 - b. the electrical energy is transferred to the oil and then converted into mechanical energy
 - c. the mechanical energy is transferred to the oil and converted into electrical energy
 - d. none of the above

Answer: a. the mechanical energy is transferred to the oil and then converted into mechanical energy

- 18. Which of the following is used as a component in hydraulic power unit?**

- a. pressure gauge
- b. filler gauge
- c. valve
- d. reservoir

Answer: c. valve

- 19. Rotary motion in a hydraulic power unit is achieved by using**

- a. hydraulic cylinder
- b. pneumatic cylinder
- c. both hydraulic and pneumatic cylinder
- d. none of the above

Answer: d. none of the above

Explanation: - A **rotational motor**, sometimes called a rotary hydraulic motor, produces a rotary motion. In such a motor the pressurized fluid supplied by a hydraulic pump act on the surfaces of the motor's gear teeth, vanes, or pistons and creates a force that produces a torque on the output shaft.

20. Accessories used in a hydraulic power unit adjust pressure and are used to generate flow and direction of the fluid.

- a. True
- b. False

Answer: b. False

21. Which of the following statements are true?

- 1. Bell housing connects motor and pump
 - 2. Centrifugal pump is a non-positive displacement pump
 - 3. Centrifugal pumps allow the back flow of fluid from delivery side to the suction side of the pump
 - 4. The function of vent plug used in a reservoir is to flush out oil
- a. 1, 2 and 4
 - b. 2, 3 and 4
 - c. 2 and 3
 - d. all the above

Answer: b. 2, 3 and 4

22. Which of the following is used as an accessory in hydraulic power unit?

- a. pumps
- b. valves
- c. motor
- d. reservoir

Answer: d. reservoir

23. Which type of pump is used for lifting water from the ground surface to the top of the building?

- a. centrifugal pump
- b. turbine pump
- c. submersible pump
- d. all the above

Answer: d. all the above

24. Pumps used in hydraulic applications are

- a. positive displacement pumps

- b. variable displacement pumps
- c. fixed displacement pumps
- d. all the above

Answer: d. all the above

25. Which of the following statements are true for accumulator used in hydraulic systems?

- 1. accumulator stores fluid with pressure
 - 2. accumulator stores fluid without any pressure
 - 3. accumulator stores compressible liquid
 - 4. spring is used as an external source to keep the fluid under hydraulic pressure
-
- a. 1, 3 and 4
 - b. 2 and 3
 - c. 1 and 4
 - d. 2, 3 and 4

Answer: c. 1 and 4

26. Which of the following is a gas charged accumulator?

- a. bladder type
- b. spring loaded accumulator
- c. weighted accumulator
- d. all the above

Answer: a. bladder type

27. How is pressure of fluid under piston calculated in a weighted accumulator?

- a. pressure of fluid = (weight added / piston area)
- b. pressure of fluid = (piston area / weight added)
- c. pressure of fluid = (weight added / piston force)
- d. pressure of fluid = (piston force / weight added)

Answer: a. pressure of fluid = (weight added / piston area)

28. Which of the following gas is used in gas charged accumulator?

- a. oxygen
- b. nitrogen
- c. carbon dioxide
- d. all the above

Answer: b. nitrogen

29. The relation for rapid change in pressure and volume adiabatically is given as

- a. $p_0 v_0 = p_1 v_1 = p_2 v_2$
- b. $p_0 v_0 = p_1 v_1^n = p_2 v_2^n$
- c. $p_0 v_0^n = p_1 v_1^n = p_2 v_2^n$
- d. none of the above

Answer: c. $p_0 v_0^n = p_1 v_1^n = p_2 v_2^n$

30. Accumulator used in gas charged accumulator is

- a. hydraulic
- b. pneumatic
- c. hydropneumatic
- d. none of the above

Answer: c. hydropneumatics

31. What is the function of pressure switch?

- a. pressure switch is used to start a motor
- b. pressure switch is used to stop a motor
- c. pressure switch is used to deenergize a solenoid
- d. all the above

Answer: d. all the above

32. Intensifier used in pneumatic systems has output pressure

- a. less than input pressure
- b. more than input pressure
- c. same as input pressure
- d. none of the above

Answer: b. more than input pressure

33. What are the reasons causing pressure drop in hydraulic systems?

- 1. long length of pipe
 - 2. friction
 - 3. type of fluid
 - 4. losses in valves and bends
-
- a. 1 and 4
 - b. only 1
 - c. 2 and 3
 - d. all the above

Answer: d. all the above

34. Calculate area of a pipe if, flow rate is 20 l/min and flow velocity is 5 cm/s.

- a. 66.66 cm²
- b. 60 cm²
- c. 62 cm²
- d. none of the above

Answer: a. 66.66 cm²

- **Explanation:-** 2. Calculate area of a pipe if, flow rate is 20 l/min and flow velocity is 5 cm/s. Given: Flow Rate = 20 litre/min.

Flow Velocity = 5 cm/s

Formula: Flow Rate = Velocity x Area
Solution:

Flow rate = 20 litre/min

= 20,000 cm³/60s

= 333.33 cm³/s

Flow Rate = Velocity x Area

333.33cm³/s = 5cm/s x Area

= 333.33cm³/s / 5 cm/s

= 66.66 cm²

Area of a pipe is 66.66 cm²

35. Which formula is used to calculate head loss in valves?

- a. $K^2 (v / 2 g)$
- b. $K (v / 2 g)$
- c. $K (v^2 / 2 g)$
- d. none of the above

Answer: c. $K (v^2 / 2 g)$

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Question Bank for Multiple Choice Questions

Program: Diploma in Mechanical Engineering	Program Code: - ME
Scheme: -I	Semester: - VI
Course: - Industrial Hydraulic and Pneumatics	Course Code: - 22655

05 – Oil Hydraulic Circuits	Marks: -10
Content of Chapter: - 5.1 Simple oil hydraulic circuits Single and Double acting Hydraulic cylinders, motors 5.2 Speed control Meter-in, Meter out, Bleed Off circuit 5.3 Regenerative, counterbalance, sequencing circuits, synchronizing, two pump unloading. 5.4 Hydraulic circuits for Milling machine, Grinding machine, Shaper machine, slotting machine 5.5 Remedies and fault detection in Pneumatic circuits	

1. Give significance of every digit used to denote a flow control valve 2.03

- A. 3 denotes the forward movement
- B. 3 denotes the backward movement
- C. 2 denotes the cylinder number
- D. 2 denotes the flow control valve number

- a. B and C
- b. A and C
- c. A and D
- d. B and D

ANSWER: a. B and C

2. Which of the following notations is used to represent a regulator unit?

- a. 3.0
- b. 0.3
- c. 3
- d. none of the above

ANSWER: b. 0.3

3. What is a pressure sequence valve?

- a. it is a combination of adjustable pressure relief valve and directional control valve

- b. it is a combination of nonadjustable pressure relief valve and directional control valve
- c. it is a combination of adjustable pressure reducing valve and check valve
- d. it is a combination of adjustable pressure reducing valve and flow control valve

ANSWER: a. it is a combination of adjustable pressure relief valve and directional control valve

- 4. In the circuit design, what is the function of a flow control valve?**
- a. Flow control valve changes the direction of flow
 - b. Flow control valve can adjust the flow rate of fluid
 - c. Both of the mentioned
 - d. None of the mentioned

Answer: Flow control valve can adjust the flow rate of fluid

- 5. What do the numbers in the 4/2 valve mean?**
- a. 4 positions and 2 ways
 - b. 4 ways and 2 positions
 - c. 4 ways and 4 positions
 - d. 4 positions and 3 ways

Answer: Option (b)

- 6. Which type of solenoid has more chances of coil failure?**
- a. AC solenoid
 - b. DC solenoid
 - c. Both AC and DC solenoids
 - d. None of the mentioned

Answer: Option (a)

- 7. Which type of solenoid has more chances of coil failure?**
- a. AC solenoid
 - b. DC solenoid
 - c. Both AC and DC solenoids
 - d. None of the mentioned

Answer: Option (a)

Explanation: - DC solenoid type of solenoid has more chances of coil failure

- 8. Most hydraulic circuits:**
- a. Operate from a central hydraulic power unit
 - b. Use air-over-oil power units
 - c. Have a dedicated power unit
 - d. Does not have dedicated power

Answer: a

Explanation: Hydraulic circuits are the circuits where the operation involves conversion of the hydraulic power into the electrical energy so that it can be stored and used and these operate from a central hydraulic power unit.

9. Why are bleed off circuits used?

- a. bleed off circuit is used to restrict the flow of fluid into the hydraulic cylinder
- b. bleed off circuit is used to restrict the flow of fluid out of the hydraulic cylinder
- c. bleed off circuits is used to reduce the speed of actuator
- d. all the above

10. What causes reduction in speed of the piston rod when the hydraulic cylinder is cushioned?

- a. oil flow through small space
- b. back pressure created in the system
- c. both a and b
- d. none of the above

Answer: c. both a and b

11. Which of the following is a type of cushioning in hydraulic cylinders?

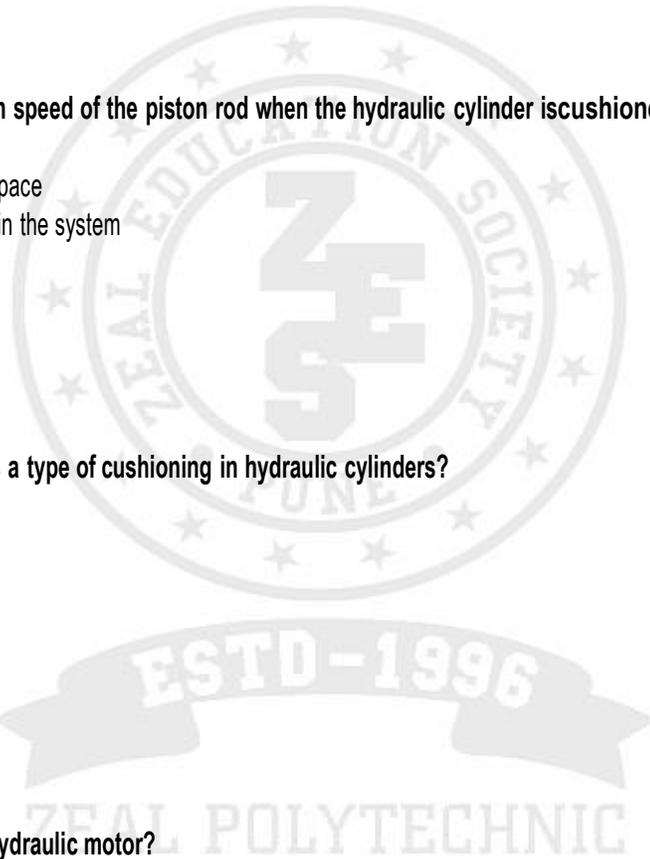
- a. trunnion cushioning
- b. adjustable cushioning
- c. clevis cushioning
- d. none of the above

Answer: b. adjustable cushioning

12. What is the function of hydraulic motor?

- 1. hydraulic motor converts hydraulic oil under pressure into torque and angular displacement
- 2. hydraulic motor converts hydraulic oil under pressure into force and linear displacement
- 3. hydraulic motor converts hydraulic energy into mechanical energy
- 4. hydraulic motor converts mechanical energy into hydraulic energy

- a. 1 and 4
- b. 1 and 3
- c. 2 and 3



d. 2 and 4

Answer: b. 1 and 3

13. Which of the following is a hydraulic cylinder based on application?

- a. welded
- b. bolted
- c. ram
- d. all the above

Answer: c. ram

14. What happens when supply of oil to a single acting cylinder is stopped?

- a. no pressure is exerted on the system
- b. more pressure is exerted on the piston
- c. less pressure is exerted on the piston
- d. none of the above

Answer: c. less pressure is exerted on the piston

15. When does expansion of spring and retraction of cylinder take place in spring typesingleacting cylinder?

- a. oil pressure exerted is less than spring compression pressure
- b. oil pressure exerted is more than spring compression pressure
- c. oil pressure exerted and spring compression pressure are same
- d. none of the above

Answer: a. oil pressure exerted is less than spring compression pressure

16. Which of the following is applicable for bleed off circuits?

- a. bleed off circuits develop heat in the system
- b. bleed off circuits are used for resistive loads
- c. bleed off circuits are used for runaway loads
- d. all the above

Answer: b. bleed off circuits are used for resistive loads

17. What is the function of sequence valve used in hydraulic circuits?

- a. sequence valves are used to perform number of operations one after the other after the set pressure is reached
- b. sequence valves are used to perform number of operations continuously before the set pressure is reached
- c. sequence valves after reaching set pressure oil is flown to the tank
- d. all the above

Answer: a. sequence valves are used to perform number of operations one after the other after the set pressure is reached

18. When does expansion of spring and retraction of cylinder take place in spring type single acting cylinder?

- a. oil pressure exerted is less than spring compression pressure
- b. oil pressure exerted is more than spring compression pressure
- c. oil pressure exerted and spring compression pressure are same
- d. none of the above

Answer: a. oil pressure exerted is less than spring compression pressure

19. Which factor decides the working pressure of a hydraulic cylinder?

- a. diameter of circular flange
- b. bore diameter of cylinder
- c. stroke length
- d. all the above

Answer: b. bore diameter of cylinder

20. Which of the following is a hydraulic cylinder based on construction?

- a. single acting cylinder
- b. double acting cylinder
- c. welded design cylinder
- d. all the above

Answer: c. welded design cylinder

21. Which energy is converted into mechanical energy by the hydraulic cylinders?

- a. hydrostatic energy
- b. hydrodynamic energy
- c. electrical energy
- d. none of the above

Answer: a. hydrostatic energy

22. What is the advantage of using a single acting cylinder?

- a. high cost and reliable
- b. honing inside the inner surface of pump is not required
- c. piston seals are not required
- d. all the above

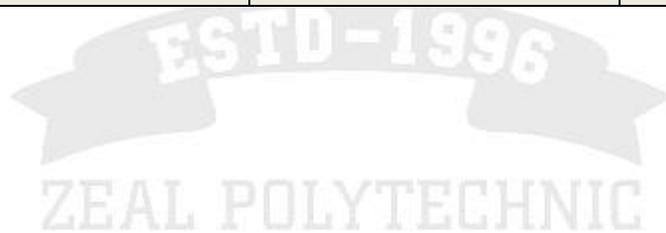
Answer: c. piston seals are not required

23. Which is/are important considerations in designing a hydraulic circuit?

- a. Safety of machines and personnel in the event of power failures
- b. Performance of given operation with minimum losses
- c. Cost of the component used in the circuit
- d. All of the mentioned

Answer: d. All of the mentioned

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Question Bank for Multiple Choice Questions

Program: Diploma in Mechanical Engineering	Program Code: - ME
Scheme: -I	Semester: - VI
Course: - Industrial Hydraulic and Pneumatics	Course Code: - 22655

06 – Pneumatic Circuits	Marks: -10
Content of Chapter: - 6.1 Direct/Indirect Control of Single and Double Acting Air cylinders, motors 6.2 Speed control circuit for cylinders and motors. 6.3 Sequencing circuits, Logic AND/OR circuits, Time delay circuits, piston continuous back and forth. 6.4. Simple Hydro-pneumatic applications. 6.5 Simple Electro-Pneumatic circuits. 6.6 Remedies and fault detection in Pneumatic circuits 6.7 Maintenance of hydraulic and Pneumatic systems	

1. Which sequential circuits generate the feedback path due to the cross-coupled connection from output of one gate to the input of another gate?
- a. Synchronous
 - b. Asynchronous
 - c. Both
 - d. None of the above

ANSWER: b. Asynchronous

2. What is/are the crucial function/s of memory elements used in the sequential circuits?
- a. Storage of binary information
 - b. Specify the state of sequential
 - c. Both a & b
 - d. None of the above

ANSWER: c. Both a & b

3. How are the sequential circuits specified in terms of time sequence?

- a. By Inputs
- b. By Outputs
- c. By Internal states
- d. All of the above

ANSWER: d. All of the above

4. The behavior of synchronous sequential circuit can be predicted by defining the signals at _____.

- a. discrete instants of time
- b. continuous instants of time
- c. sampling instants of time
- d. at any instant of time

ANSWER: a. discrete instants of time

5. Give significance of every digit used to denote a flow control valve 2.03

- A. 3 denotes the forward movement
- B. 3 denotes the backward movement
- C. 2 denotes the cylinder number
- D. 2 denotes the flow control valve number

- a. B and C
- b. A and C
- c. A and D
- d. B and D

ANSWER: a. B and C

6. Which of the following notations is used to represent a regulator unit?

- a. 3.0
- b. 0.3
- c. 3
- d. none of the above

ANSWER: b. 0.3

7. Which of the following logic valve is known as shuttle valve?

- a. OR gate
- b. AND gate
- c. NOR gate

d. NAND

ANSWER: a. OR gate

8. What is a pressure sequence valve?

- a. it is a combination of adjustable pressure relief valve and directional control valve
- b. it is a combination of nonadjustable pressure relief valve and directional control valve
- c. it is a combination of adjustable pressure reducing valve and check valve
- d. it is a combination of adjustable pressure reducing valve and flow control valve

ANSWER: a. it is a combination of adjustable pressure relief valve and directional control valve

9. What is the difference between signal air and control air?

- a. signal air actuates final control valve and control air flows to the cylinder through the final control valve for forward and backward movement of piston rod
- b. control air actuates final control valve and signal air flows to the cylinder through the final control valve for forward and backward movement of piston rod
- c. both a and b

ANSWER: a.

10. Explanation: signal air actuates final control valve and control air flows to the cylinder through the final control valve for forward and backward movement of piston rod

11. Which of the following is used to sense the initial and final positions of a piston rod?

- a. lever operated direction control valve
- b. limit switch
- c. roller lever valve
- d. all the above

ANSWER: d. all the above

12. Which valve gets activated only in one direction that is forward or backward movement of the piston rod?

- a. roller lever valve
- b. idle roller lever valve
- c. both a and b
- d. none of the above

ANSWER: b. idle roller lever valve

a. Which numbers are used to denote retraction of a piston rod?

- a. even numbers
- b. odd numbers
- c. both even and odd numbers
- d. none of the above

ANSWER: b. odd numbers

13. Which of the following logic valve is known as shuttle valve?

- a. OR gate
- b. AND gate
- c. NOR gate
- d. NAND

Answer: a

Explanation: - OR gate logic valve is known as shuttle valve

14. In pneumatic systems, AND gate is also known as

- a. Check valve
- b. Shuttle valve
- c. Dual pressure valve
- d. None of the above

Answer: c

Explanation: - In pneumatic systems, AND gate is also known as Dual pressure valve

15. Which of the following is used to sense the initial and final positions of a piston rod?

- a. Lever operated direction control valve
- b. Limit switch
- c. Roller lever valve
- d. All the above

Answer: d

Explanation: - To sense the initial and final positions of a piston rod, Lever operated direction control valve, Limit switch and Roller lever valve can be used

Q13. Which valve gets activated only in one direction that is forward or backward movement of the piston rod?

- a. Roller lever valve
- b. Idle roller lever valve
- c. Both a and b
- d. None of the above

Answer: b

Explanation: Idle roller lever valve gets activated only in one direction that is forward or backward movement of the piston rod

Q14. Which numbers are used to denote retraction of a piston rod?

- a. Even numbers
- b. Odd numbers
- c. Both even and odd numbers
- d. None of the above

Answer: b

Explanation: Odd numbers are used to denote retraction of a piston rod

Q15. Which of the following is an element of time delay valve?

- a. Flow control valve
- b. Direction control valve
- c. Both a and b
- d. None of the above

Answer: c

Explanation: Flow control valve and Direction control valve are an element of time delay valve

Q16. Overlapping of signals in pneumatic systems can be avoided by using

- a. Rolling lever valve
- b. Idle roller lever valve
- c. Both a and b
- d. None of the above

Answer: c

Explanation: Overlapping of signals in pneumatic systems can be avoided by using Rolling lever valve and Idle roller lever valve

Q17. How is proximity switch differentiated from limit switch?

- a. Proximity switch is activated when moving parts have physical contact with it
- b. Proximity switch is activated when non-moving parts have physical contact
- c. Proximity switch is activated when moving parts are close to it
- d. None of the above

Answer: c

Explanation:

Q18. In which circuits, relay of low voltage and low current is used to make open or close contact?

- a. High voltage and high current circuit
- b. Low voltage and low current circuit
- c. High voltage and low current circuit

- d. Low voltage and low current circuit

Answer: a

Explanation: In High voltage and high current circuit relay of low voltage and low current is used to make open or close contact

Q19. In electro pneumatic circuits

- a. Spool is shifted by signal air
- b. Spool is shifted by control air
- c. Spool is shifted by electromotive force
- d. All the above

Answer: c

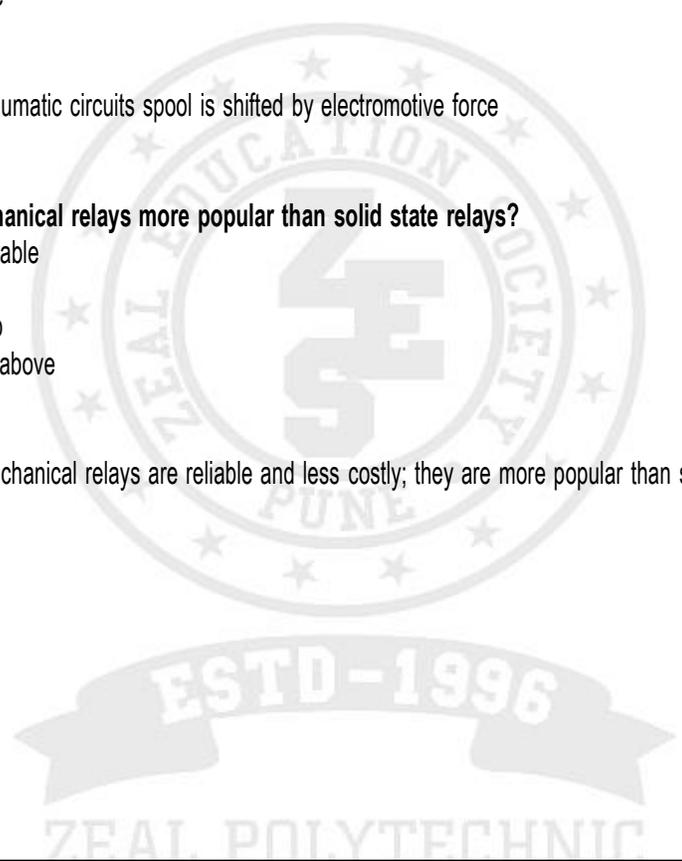
Explanation: In electro pneumatic circuits spool is shifted by electromotive force

Q20. Why are electromechanical relays more popular than solid state relays?

- a. They are reliable
- b. Less costly
- c. Both a and b
- d. None of the above

Answer: c

Explanation: As electromechanical relays are reliable and less costly; they are more popular than solid state relays.



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