Hydraulic & Pneumatic: Fundamental & Symbols
Session: 1 & 2

01.01 A push or pull applied against an object to move, it is called a……:
(a) Force (b) Pressure (c) Torque (d) Displacement

01.02 A hydraulic fluid must have enough force to do work of the system & overcome…….. in the system:
(a) Pressure (b) Resistance (c) Weight (d) None of these

01.03 The……..determines how much force is required to start, stop or cause a change in the movement of an object.
(a) Pressure (b) Weight (c) Inertia (d) Mass

01.04 The…… of a liquid is determined by comparing the weight of the fluid to the weight of an equal amount of water.
(a) Pressure (b) Force (c) Specific Gravity (d) None of these

01.05 ……is the amount of force exerted on an object divided by the area over which the force is exerted.
(a) Pressure (b) Hydraulic Force (c) Torque (d) None of these

01.06 …….takes place when a force is moved through a distance.
(a) Power (b) Work (c) Acceleration (d) None of these

01.07 Power is defined as an amount of ……..done in a given amount of time.
(a) Force (b) Displacement (c) Work (d) None of these

01.08 If a force of 1000kg is exerted against a piston having an area of $50cm^2$, the resulting pressure is……Kg/cm^2
(a) $10Kg/cm^2$ (b) $20Kg/cm^2$ (c) $50000Kg/cm^2$ (d) $200Kg/cm^2$

01.09 The ideal flow in a pipe is called-
(a) Laminar (b) Turbulence (c) Both ‘a’& ‘b’ (d) None of these

01.10 In accordance with Bernoulli’s Principle, when flow increases, pressure will……
(a) Increase (b) Decrease (c) No effect (d) Either a or b

01.11 The theory stating that pressure in a confined liquid is distributed equally throughout the fluid is……
(a) Bernoulli’s law (b) Boyle’s law (c) Pascal’s Law (d) Faraday’s law

01.12 In a hydraulic system, what must the force do?
(a) Perform work (b) Overcome system resistance (c) Both ‘a’& ‘b’ (d) None

01.13 If two different pistons have a force ratio of 4:1, the movement ratio is…….
(a) 4:1 (b) 1:4 (c) 1:6 (d) 16:1

01.14 Atmospheric pressure on the barometer scale is-
(a) 840mm (b) 76cm (c) 740mm (d) None of these

01.15 Liquid seeks a level depending on the-
(a) Force (b) Work (c) Pressure (d) Area

01.16 The relationship between Force, Pressure, Area-
(a) F = P x A (b) P = FxA (c) A = FxP (d) None

02.17 The basic symbol for a valve is a……
(a) Circle (b) Square (c) Triangle (d) Rectangle

02.18 ……is the basic symbol for rotating components such as pump & motor..
(a) Circle (b) Square (c) Triangle (d) Rectangle

02.19 Hydraulic returns lines are drawn as …..which carries out leakage oil back to the tank-
(a) Solid line (b) Long dashes (c) Short dashes (d) None

02.20 How many positions has the 4/3 way valve.
(a) 2 (b) 3 (c) 4 (iv) 5

02.21 How many envelops (squares) has the 4/2 way valve.
(a) 2 (b) 3 (c) 4 (iv) 5

02.22 …….line carries the main stream of flow in the system.
(a) Solid (b) Long dashes (c) Short dashes (d) Arrow

02.23 The arrow points out ◯ showing the…….. as a source.
(a) Hydraulic Pump (b) Hydraulic Motor (c) 4/3 way valve (d)Relief valve

02.24 The arrow points in ◯ showing the…….receive hydraulic energy.
(a) Hydraulic Pump (b) Hydraulic Motor (c) 4/3 way valve (d) Accumulator

02.25 The two arrows point out ◯ showing the pump can operate in……
(a) Forward (b) Reverse (c) Both ‘a’ & ‘b’ (d) None

02.26 The two arrow points in ◯ showing that the motor is……..
(a) Unidirectional (b) Bidirectional (c) Either ‘a’ or ‘b’ (d) None

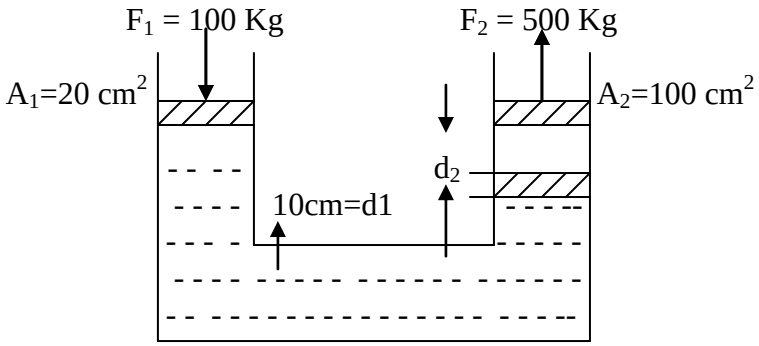
02.27 ……Positioning valves such as relief valve, proportional valve has any number of positions between fully open and fully closed.
(a) Finite (b) Infinite (c) Both ‘a’ & ‘b’ (d) None

02.28 ……..Positioning valves such as directional control valve can be operated in certain no. of positions.
(a) Finite (b) Infinite (c) Both ‘a’ & ‘b’ (d) None

02.29 In symbol of relief valve, the…….. line indicates operation by pressure.
(a) main (b) pilot (c) return (d) None

02.30 In symbol of relief valve, …….. indicates adjustable the pressure.
(a) main line (b) pilot line (c) return line (d) arrow with spring

02.31 …….. line i.e. pilot line carries the fluid that is used to control the operation of a valve or other component.
(a) solid (b) Long dashes (c) Short dashes (d) Arrow

1. 

If F_1 = 100kg, A_1 = 20cm^2, displacement, d_1 = 10cm then find displacement d_2 =?

2. State Pascal's law?

3. What is Bernoulli's principle?

4. Name several advantages of a hydraulic system.

5. In what two forms do we find energy in the hydraulic fluid?

6. Define the terms hydrodynamic & hydrostatic.

7. How pressure is created?

8. 1 gpm = 231 inch^3/min. convert it into cm^3/min.

Answer Sheet

Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.
1.	**a**	**9.**	**a**	**17.**	**b**	**25.**	**c**
2.	**b**	**10.**	**b**	**18.**	**a**	**26.**	**b**
3.	**c**	**11.**	**c**	**19.**	**c**	**27.**	**b**
4.	**c**	**12.**	**c**	**20.**	**b**	**28.**	**a**
5.	**a**	**13.**	**b**	**21.**	**a**	**29.**	**b**
6.	**b**	**14.**	**b**	**22.**	**a**	**30.**	**d**
7.	**c**	**15.**	**c**	**23.**	**a**	**31**	**b**
8.	**b**	**16.**	**a**	**24.**	**b**		

Hydraulic & Pneumatic: Hydraulic Oil, Tank & Filter
Session: 3

03.01 Name four primary purposes of the hydraulic oil

03.02 Name quality requirements of a hydraulic oil.

03.03 Define viscosity. What is the common unit of measuring viscosity?

03.04 How is viscosity affected by cold & by heat?

03.05 What are the three factors that determine the properties of a hydraulic oil?

03.06 What **is demulsibility?**

03.07 If viscosity is too low, what can happen to the system?

03.08 ……is the measure of the fluid's resistance to flow or an inverse measure of fluidity.
(a) Viscosity (b) Force (c) Temperature (d) Pressure

03.09 The unit of kinematic viscosity of VG68 is-
(a) ^{0}C (b) Centistoke (c) Kelvin (d) Pascal

03.10 In ISO VG68 viscosity 68 lies at temp-
(a) 40^0C (b) 0^0C (c) 100^0C (d) 15^0C

03.11 …….in the lowest temperature at which a fluid will flow-
(a) Flash point (b) Fire point (c) Pour point (d) None

03.12 A hydraulic fluid must also act as a ……between the contacting surfaces of the components.-
(a) Lubricant (b) Sealing agent (c) Cooling agent (d) None

03.13 The viscosity of a fluid measures its……..friction-
(a) External (b) Internal (c) both (d) None of these

03.14 A hydraulic fluid that has a low viscosity will flow ……..than a high viscous fluid.-
(a) Faster (b) Slower (c) Cannot flow (d) None

03.15 The change in fluid viscosity caused by a change in temp. is referred to as the fluids…….
(a) Viscosity (b) Viscosity Index (c) resistance (d) None

03.16 The property of a fluid to keep two surfaces separated under high pressure is referred to as its -
(a) Lubricity (b) Film strength (c) Viscosity (d) Viscosity Index

03.17 The chemical reaction between hydraulic fluid & air is called……
(a) Oxidation (b) Corrosion (c) No reaction (d) None

03.18 The term that describes the stability of fluid viscosity when it is heated is-
(a) Pour point (b) Vapour pressure (c) Viscosity index (d) Lubricity

03.19 Corrosion in a hydraulic system is generally caused by-
(a) Acids (b) Alkalis (c) Oxidation (d) All of the above

03.20 Air is usually introduced into a hydraulic system through leaks in the …….line.

(a) Outlet (b) Inlet (c) Pilot line (d) None

03.21 Any deterioration of a metallic surface can be said as……
(a) Oxidation (b) Rust (c) Corrosion (d) None

03.22 What are hydraulic fluids required to do?
(a) Lubricate (b) Remain Incompressible (c) Transmit Power (d) All of the above

03.23 Cleanliness level of hydraulic system is according to…….
(a) NAS 4-5 (b) NAS 15-16 (c) NAS 0-2 (d) NAS 8-9

03.24 The minimum & maximum viscosity of VG68 oil at 40^0C…….
(a) 61.2 & 74.8 (b) 68 (c) 15-100 (d) None

03.25 Flash point of petroleum base hydraulic oil (VG-68) is
(a) 40^0C (b) 90^0C (c) 150^0C (d) 210^0C

03.26 Pour point of VG-68 oil is-
(a) 0^0C (b) 10^0C (c) -21^0C (d) -4^0C

03.27 Water content in water glycol fluid used in RGM-
(a) 35-40% (b) 50% (c) 0% (d) 100%

03.28 The max. admissible concentration of water content in hydraulic oil is-
(a) 500ppm (b) 1000ppm (c) 1500ppm (d) 2000ppm

03.29 The maximum decrease in original value of viscosity of hydraulic oil is-
(a) 0% (b) 5% (c) 10% (d) 20%

Answer Sheet

Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.
1.		**9.**	**b**	**17.**	**a**	**25.**	**d**
2.		**10.**	**a**	**18.**	**c**	**26.**	**c**
3.		**11.**	**c**	**19.**	**d**	**27.**	**a**
4.		**12.**	**a**	**20.**	**b**	**28.**	**b**
5.		**13.**	**b**	**21.**	**c**	**29.**	**c**
6.		**14.**	**a**	**22.**	**d**		
7.		**15.**	**b**	**23.**	**d**		
8.	**a**	**16.**	**b**	**24.**	**a**		

Hydraulic Tank
Session: 4

04.01 The contaminants ……..better with slower movement of hydraulic oil in reservoir. -
(a) Separate or settle (b) Drain (c) Dissolve in oil (d) No effect

04.02 A baffle in a reservoirs keeps the oil in contact with the sides to…….the fluid-
(a) Heat (b) Pressurise (c) Settle (d) Cool

04.03 The bottom of a reservoir be designed-
(a) V-shaped (b) With a drain (c) Sloped (d) All of above

04.04 ……prevents pressure or suction buildups in a reservoir.
(a) Pump (b) Baffle plate (c) Filters (d) Air breather

04.05 Hydraulic tank in cleaned by a **lint** free cloth at-
(a) 200hrs (b) 500hrs (c) 1000hrs (d) IOH

04.06 Reservoir's capacity is kept……..times the pump capacity-
(a) Same as pump's capacity (b) 2 to 3 times (c) 100 times (d) None

04.07 Height of the baffle plate inside a reservoir is kept…….the ht. of the oil level.
(a) Same (b) 3/4 (c) 2/3 (d) None

04.08 The bottom portion of return lines terminate in the tank be at an angle of-.
(a) Same (b) 45^0 (c) 60^0 (d) None

04.09 The baffle plate separates the inlet line from the……..line.
(a) Pressure (b) Return (c) Drain (d) None

04.10 Inlet & return lines must be terminate …….the fluid level.
(a) High (b) Below (c) Same (d) None

04.11 Name three function of the reservoir.

04.12 What is the purpose of air breather at the reservoir?

04.13 Why is a return line often cut at 45^0 angle?

04.14 What are the functions of baffle plate?

04.15 Name the parts of a reservoir.

Answer Sheet

Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.
1.	a	4.	d	7.	c	10	b
2.	c	5.	c	8.	b		
3.	d	6.	b	9	b		

Filter
Session: 5

05.01 When a filter is specified as so many microns, it usually refers to the filters……rating.
(a) Nominal (b) Absolute (c) Performance (d) None

05.02 Pressure line filters can trap much……particles than inlet line filters.
(a) Bigger (b) Smaller (c) Either (a) & (b) (d) None

05.03 Filter is……than strainer.
(a) Finer (b) Coarser (c) Either (a) & (b) (d) None

05.04 ……..filters are used for most minute filtration in hydraulic systems.
(a) Adsorbent (b) Absorbent (c) Mechanical (d) None

05.05 Inlet strainers should be mounted far enough below the fluid level of a reservoir to prevent a …….from forming.
(a) Whirlpool (b) Laminar (c) No effect (d) None

05.06 When replacing a filter always check the condition of the filter housing.
(a) Nuts bolt (b) Tightness (c) Size (d) Gasket

05.07 Filters (10-25µ) provided in return line generally have a ……..
(a) Check valve as a bypass (b) Throttle valve as a bypass valve
(c) Gate valve as a by pass valve (d) None of these.

05.08 A simple screen or a wire strainer is rated for filtering fineness by a ……. No. or its near equivalent standard seine no.
(a) Mesh (b) Micron (c) Porosity (d) None

05.09 149 microns=100 mesh.Find 200mesh =.. µ(higher the mesh or sieve no.,finer the screen)
(a) 210 (b) 149 (c) 105 (d) 74

05.10 Pressure line filter provided for proportional valve is of……..
(a) 3µ (b) 10µ (c) 25µ (d) 150µ

05.11 Suction filter provided for fixed displacement pump is of-
(a) 10µ (b) 25µ (c) 150µ (d) None

05.12 Pressure line & return line filters are replaced at-
(a) 150hrs (b) 100hrs (c) 200hrs (d) 500hrs

05.13 Suction filter is replaced at-
(a) 50hrs (b) 100hrs (c) 200hrs (d) 500hrs

05.14 Filters not only function more effectively than strainers do, they also maintain a …….pressure drop.
(a) Low (b) High (c) Nil (d) None of these

05.15 Filters are usually furnished with ……..type mediums.
(a) Surface (b) Depth (c) Adsorbent (d) None of these

05.16 Define filter?

05.17 Name three possible locations for a filter.

05.18 What does full-flow filter mean?

05.19 How many filters are provided on 09-CSM in different circuit?

05.20 What is meant by nominal & absolute micron rating?

Answer Sheet

Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.
1.	**a**	**6.**	**d**	**11.**	**c**	**16.**	
2.	**b**	**7.**	**a**	**12.**	**c**	**17.**	
3.	**a**	**8.**	**a**	**13.**	**d**	**18.**	
4.	**b**	**9.**	**d**	**14.**	**a**	**19.**	
5.	**a**	**10.**	**b**	**15.**	**b**	**20.**	

Hydraulic & Pneumatics
Session: 6 Hydraulic Hoses

06.01 When selecting a pipe for hydraulic lines always make sure it will withstand the system……
(a) Flow (b) Pressure (c) Force (d) None

06.02 Pressure loss in a pipe is determined by the fluid flow, the factor for the area of the pipe & the fluid…….
(a) Temperature (b) Viscosity (c) Viscosity index (d) None

06.03 A bend in tubing should be smooth and have a ……..cross section.
(a) Sharp (b) twisted (c) round (d) None

06.04 If a hydraulic line has high fluid velocity, the flow will be……...
(a) Turbulent (b) Laminar (c) Both (d) None

06.05 Bursting pressure of hose is kept ……times the working pressure.
(a) Same (b) 2 (c) 4 (d) 8

06.06 The pump inlet line is usually ……. than the outlet.
(a) Larger (b) Smaller (c) Has more strength (d) None

06.07 Flexible hose is used when the hydraulic lines are subjected to…….
(a) Movement (b) Fixed (c) Both (d) None

06.08 Two wire braided hoses permit…….pressure.
(a) Lower (b) Higher (c) Zero (d) None

06.09 SAE $100R_2$ standard is applicable for……..hose.
(a) Suction (b) Pressure (c) Return (d) Leakage line

06.10 DIN 20022 standard is used for…….hose.
(a) Suction (b) Pressure (c) Return (d) None

06.11 DIN 20023 standard is used for…….hose.
(a) 4 Spiral wire wrapped (b) Single wire braid (c) Textile braided (d) None

06.12 EN853 2SN standard is used for…….hose.
(a) Single wire braid (b) Double wire braid (c) 4 Spiral wire wrapped (d) None

06.13 Hydraulic hoses have …….absorption coefficient .
(a) Low (b) Medium (c) High (d) None

06.14 The inner layer of hose should……..compatible with the hydraulic oil being used.
(a) be (b) not be (c) both (d) none

06.15 The hydraulic hose can with stand temperatures…….
(a) 0^0F to 100^0F (b) 10^0F to 200^0F (c) -40^0F to 200^0F (d) 80^0C

06.16 The recommended velocity range in pump inlet line……
(a) 1-3 ft/sec (b) 2-4 ft/sec (c) 7-20 ft/sec (d) None

06.17 The recommended velocity range in working line……

(a) 1-3 ft/sec (b) 2-4 ft/sec (c) 7-20 ft/sec (d) None

06.18 Doubling the inside diameter of a line, the velocity is……
(a) quadruples (b) double (c) one half (d) one fourth

06.19 Halving the inside dia of a line ……the oil velocity.
(a) quadruples (b) double (c) one half (d) one fourth

06.20 The I.D. of a flexible hose in inch is generally given by-
(a) Pipe no./4 (b) Pipeno./8 (c) Pipeno./12 (d) Pipeno./16

06.21 The angle on the end of flared tube is either……..^{0} or ……^{0}. -
(a) 37^0 or 45^0 (b) 20^0 or 30^0 (c) 60^0 or 75^0 (d) flareless ends

06.22 The type of pipe threaded recommended for hydraulic fittings is commonly called a……thread.
(a) dry seal (b) welded connections(c) deburr threaded (d) none

06.23 Radius of bend is measured from…… of hose
(a) either end (b) centre Line of hose(c) either a or b (d) none

06.24 Hydraulic hose & fittings are either the crimp (permanent) or……..types.
(a) reusable (b) welded (c) brazed (d) none

06.25 Write the specification of hoses?

06.26 Write the reasons of hose failure?

06.27 Why is pipe reinforced?

Answer Sheet

Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.
1.	**b**	**6.**	**a**	**11.**	**a**	**16.**	**b**	**21**	**a**
2.	**b**	**7.**	**a**	**12.**	**b**	**17.**	**c**	**22**	**a**
3.	**c**	**8.**	**b**	**13.**	**a**	**18.**	**d**	**23**	**b**
4.	**a**	**9.**	**b**	**14.**	**a**	**19.**	**a**	**24**	**a**
5.	**c**	**10.**	**b**	**15.**	**c**	**20.**	**d**		

Hydraulic & Pneumatics
Session: 7 Hydraulic Seals

07.01 A positive seal…….. even a minute amount of fluid from getting past.
(a) prevents (b) permits (c) either (a) & (b) (d) None

07.02 A non positive seal…….. a small amount of internal leakage.
(a) prevents (b) permits (c) both a&b (d) None

07.03 ……..seals are installed between parts which move relative to one another.
(a) Positive (b) Non positive (c) Dynamic (d) Static

07.04 'O' ring is a pressure actuated seal as well as …….. seal.
(a) Compression (b) Tension (c) Non positive (d) None

07.05 Lip seals are……seals & used principally to…….. rotating shafts.
(a) Positive, seal (b) Non positive, Cover (c) Static, seal (d) None

07.06 T-ring is…….seal for reciprocating parts.
(a) Dynamic (b) Static (c) Non positive (d) None

07.07 Cup seal are …….seals & used on cylinder piston.
(a) Positive (b) Non positive (c) Static (d) None

07.08 The seal used in D.C. Valve is……...
(a) Positive (b) Non positive (c) Dynamic (d) Static

07.09 Piston Rings are fabricated from……or steel
(a) Pig iron (b) Wrought iron (c) Cast Iron (d) None

07.10 Dia of seal on piston & rod in tamping unit UP/DN cylinder is…….
(a) 100/50 (b) 100/45 (c) 125/50 (d) 80/40

07.11 Track lifting cylinder seal dia on piston & rod…….
(a) 100/50 (b) 100/45 (c) 125/50 (d) 50/36

07.12 Dia of seal on piston & rod of lining cylinder is…….
(a) 100/45 (b) 100/50 (c) 80/30 (d) 125/50

07.13 In the cylinder piston main seal used is…….
(a) Glide Ring (b) Slide Ring (c) Strap Seal (d) None

07.14 In the cylinder rod main seal used is…….
(a) Glide Ring (b) Slide Ring (c) Wiper Seal (d) None

07.15 The temperature limit for a seal…….
(a) -40^0F to 200^0F (b) 0^0 to 200^0F (c) 20^0F to 200^0F (d) None

07.16 Write type of seals used

07.17 What is meant by dynamic seal?

07.18 What factors are considered during selection of a seal?

07.19 Write functions of seal?

07.20 Which seals are provided on big squeezing cylinder?

07.21 Name three operating factors that affect seal life?

Answer Sheet

Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.
1.	**a**	**4.**	**a**	**7.**	**a**	**10.**	**d**	**13.**	**a**
2.	**b**	**5.**	**a**	**8.**	**b**	**11.**	**c**	**14.**	**b**
3.	**c**	**6.**	**a**	**9.**	**c**	**12.**	**a**	**15.**	**a**

Hydraulic & Pneumatics
Session: 8 Hydraulic Pumps

08.01 A hydraulic pump converts……energy into…….energy.
(a) Mechanical, Hydraulic (b) Hydraulic, Mechanical
(c) Hydraulic, Electromech (d) None

08.02 A hydraulic pumps are either fixed displacement or…….displacement.
(a) Constant (b) Variable (c) Non positive (d) None

08.03 The vanes of a pump that are not spring loaded are held in contact with the cam ring by both the combination of…….and……pressure.
(a) Centrifugal & Oil (b) Centripetal & oil (c) Reciprocating & Oil (d) None

08.04 In most of the hydraulic system……displacement pumps are used.
(a) Positive (b) Non positive (c) Fixed (d) Variable

08.05 The capacity a pump can be specified by which of the following.
(a) Gallons per minutes (b) Cubic centimeter per revolution
(c) litre per minute (d) All of the above.

08.06 The vane tips of a vane pump are usually constructed with a groove to permit…….
(a) Longer vane life (b) Better lubrication
(c) Free movement of vanes (d) All of the above.

08.07 The fluid flow in a fixed displacement vane pump is changed by changing the…….
(a) Shifting the cam ring (b) Off centre rotor (c) rpm of prime mover (d) None

08.08 The fluid flow in a variable displacement vane pump is changed by-…….
(a) Changing the discharge port (b) Shifting the cam ring
(c) Shifting the housing (d) Changing the inlet port

08.09 Internal gear pumps are used due to following characteristics.
(a) Low pressure (b) Slow speeds (c) Small capacities (d) All of the above.

08.10 The pumps in a hydraulic system, creates-.
(a) Fluid pressure (b) Fluid flow (c) Flow resistance (d) All of the above

08.11 A vane pump in which the rotor is placed off centre is said to be -.
(a) Unbalanced (b) Balanced (c) Fixed (d) None

08.12 The delivery or flow rating of a pump is referred to its -.
(a) Pressure (b) Efficiency (c) Capacity (d) None

08.13 The service life of a pump is specified in terms of operating-.
(a) Flow rate (b) Speed (c) Hours (d) Fluid pressure

08.14 In internal gear pump, both gears rotate in……..direction-.
(a) Same (b) Opposite (c) One Gear is stationary (d) None

08.15 In external gear pump, both gears rotate in……direction-.
(a) Same (b) Opposite (c) One Gear is stationary (d) None

08.16 Pressure is reduced at pump inlet due to-.
(a) Less oil in tank (b) Pump speed is less (c) Partial vacuum (d) None

08.17 Pump caters oil for Tamping Unit lifting-lowering in 09-CSM-.
(a) 90lpm (b) 38 & 17 GPM (c) 25 & 25 GPM (d) 38 & 22 GPM

08.18 38 & 17 GPM pump is mounted on …….gear box in 09-CSM. -.
(a) Z.F. (b) Funk (c) Reduction (d) Distributor

Answer Sheet

Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.
1.	**a**	**5.**	**d**	**9.**	**d**	**13.**	**c**	**17.**	**d**
2.	**b**	**6.**	**d**	**10.**	**b**	**14.**	**a**	**18.**	**b**
3.	**a**	**7.**	**c**	**11.**	**a**	**15.**	**b**		
4.	**a**	**8.**	**b**	**12.**	**c**	**16.**	**d**		

Hydraulic & Pneumatics
Session: 9 Hydraulic Pumps

09.01 ……pump caters flow for work drive motor in 09-CSM, 09-3X.-.
(a) Variable axial piston pump (b) Vane pump (c) Gear Pump (d) Radial piston pump

09.02 Swash plate in axial piston pump tilted by -.
(a) Manually Control (b) Pilot pressure control (c) Electronic control(d) All of the these

09.03 Charge pump pressure is set at-.
(a) 30 bar (b) 110 bar (c) 210 bar (d) 380 bar

09.04 Variable pump contains cross relief valves because it is ……pump-.
(a) LHS Pump (b) Reversible (c) RHS Pump (d) None

09.05 More the angle of tilting of swash plate, …….flow we get-.
(a) Less (b) More
(c) Does not depend on angle of swash plate (d) None

09.06 Flushing valve is provided in work drive/travel drive closed loop circuit for …….of oil.
(a) Cooling (b) Heating (c) Does not effect (d) None

09.07 ……displacement can be get by axial piston variable pump-.
(a) 250cm^3+ (b) 500cm^3+ (c) 750cm^3+ (d) 1000cm^3+

09.08 Pump does not give flow due to……..-.
(a) Direction of rotation is wrong (b) Pump shaft broken (c) Both a&b (d) None

Answer Sheet

Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.
1.	**a**	**4.**	**b**	**7.**	**c**
2.	**d**	**5.**	**b**	**8.**	**c**
3.	**a**	**6.**	**a**		

Hydraulic & Pneumatics
Session: 10 Hydraulic Pumps

10.01 Pump's bearing failure is caused due to-.
(a) Inadequate lubrication (b) Contaminants in pump (c) Both a & b (d) None

10.02 Pump making abnormal sound due to-.
(a) More viscous oil (b) Air entrapped (c) Filter clogged (d) All of the above

10.03 Excess foaming can be created due to -.
(a) Entrapping excess air (b) Pump's speed too less (c) Oil more viscous (d) None

10.04 ……is a sort of vacuum created in the hydraulic oil -.
(a) Aeration (b) Cavitation (c) Emulsification (d) None

10.05 Write difference between fixed & variable displacement pump.

10.06 What are the reasons of abnormal sound giving by pump?

10.07 How direction of rotation is changed in vane pump?

10.08 Give the classification of pump?

10.09 Name the parts of Axial piston pump.

10.10 What causes the pistons to reciprocate in a axial piston pump?

10.11 How can displacement be varied in an axial piston pump.

Answer Sheet

Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.
1.	c	4.	b		
2.	d				
3.	a				

Hydraulic & Pneumatics
Session: 11

11.01 Pressure control valves are used to control fluid …….and……...
(a) Flow & pressure (b) Force & pressure (c) Speed & Pressure (d) None

11.02 Relief valves normally remain in…… position
(a) opened (b) closed (c) either 'a' or 'b' (d) None

11.03 The pressure at which relief valve opens is its……pressure-
(a) Override (b) Cracking (c) Pilot Pressure (d) None

11.04 Functioning of a pressure control valve in a hydraulic system is to-
(a) Regulate flow rate (b) Regulate pressure (c) Limit pressure (d) All of these

11.05 Most unloading valves are ……..operated rather than pressure operated- .
(a) Pilot (b) Direct (c) Mechanical (d) None.

11.06 When a poppet relief valve is controlled from a remote point, the main valve is usually a ……..stage valve.
(a) One (b) Two (c) Three (d) None

11.07 The difference in area between the plunger & poppet seat is approximately…..in unloader valve.
(a) 15% (b) 40% (c) 70% (d) None

11.08 Reasons of no pressure in the system-
(a) Orifice in main spool choked up (b) Vent open to tank
(c) Safety valve at zero setting (d) All of the above.

11.09 Safety valve is set…….than the setting of unloading valve..
(a) Less (b) Equal (c) More (d) None.

11.10 …….is provided in accumulator charging circuit-.
(a) Relief valve (b) Unloader valve (c) Pressure reducing valve (d) Sequence valve

11.11 When pressure drops to about……% of the valve setting, the ball (poppet) & piston reseat and the cycle is repeated -.
(a) 15% (b) 50% (c) 85% (d) None

11.12 The …….has closed permitting the accumulator to maintain pressure in the system during unloading-.
(a) Check valve (b) Ball (c) Piston (d) None

Answer Sheet

Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.
11.01	**a**	**11.04**	**d**	**11.07**	**a**	**11.10**	**b**
11.02	**b**	**11.05**	**a**	**11.08**	**d**	**11.11**	**c**
11.03	**b**	**11.06**	**b**	**11.09**	**c**	**11.12**	**a**

Hydraulic & Pneumatics
Session: 12

12.01 Pressure reducing valves are used to reduce or limit the pressure in……circuit of the system.
(a) Primary (b) Secondary (c) Testing (d) None

12.02 Pressure reducing valves are provided for……
(a) Squeezing circuit (b) Booster circuit (c) Brake circuit (d) All of these

12.03 Pressure reducing valves are normally remains in …….position.-
(a) Opened (b) Closed (c) Both (d) None

Q. Where are the ports of a relief valve connected?

Q. What is difference between pressure relief valve and pressure reducing valve?

Q. Justify the need of pressure control valve?

Q. What is the function of unloader valve?

Answer Sheet

Q. No.	Ans.	Q. No.	Ans.
12.01	b	12.03	a
12.02	d		

Hydraulic & Pneumatics
Session: 13

13.01 A …..can start, stop or change direction of fluid flow.
(a) Directional control valve (b) Pressure control valve
(c) Flow control valve (d) Pump

13.02 4/3 way valve have……..positions.
(a) 2 (b) 3 (c) 4 (d) 5

13.03 4/2 way valve have……..positions.
(a) 2 (b) 3 (c) 4 (d) 5

13.04 Spring centered valve have…… spring on each end.
(a) 1 (b) 2 (c) 3 (d) 4

13.05 Spring offset valve have…….spring on one end only- .
(a) 1 (b) 2 (c) 3 (d) 4

13.06 D.C. valves are operated by.
(a) Solenoid (b) Manually (c) Hydraulic power (d) All of the above

13.07 In lifting circuit of 09-CSM, the normal condition of 4/3 way valve is…….
(a) Floating condition (b) Closed position (c) Tandem Centre (d) None

13.08 D.C. valves have…….spool.
(a) Sliding (b) Rotary (c) Both a & b (d) None

13.09 In lining circuit on tamping machine,……. is used as bypass valve-
(a) Check valve (b) Spring off set valve (c) Spring centered valve (d) None.

13.10 A 4-way valve has……..primary working ports.-.
(a) 1 (b) 2 (c) 3 (d) 4

13.11 A four way spool valve which does not shift linearly is a -.
(a) Rotary valve (b) Reciprocating valve (c) Both (d) None

13.12 The pressure at which check valve will start to open is called its-.
(a) Override pressure (b) Cracking pressure (c) Seating pressure (d) None

13.13 A three position, 4-way valve is also called as a-.
(a) cross over valve (b) Check valve (c) 3/2 way valve (d) 2/2 way valve

13.14 …….are identified by their name and the no. of piping connections-.
(a) D.C. valve (b) Relief valve (c) Flow control valve (d) Pressure reducing valve

13.15 Double Decker solenoid operated D.C. valves are referred as -.
(a) Directed Operated valve (b) Pilot operated valve
(c) Manually Operated valve (d) None

13.16 ……..allows hydraulic fluid to flow in one direction -.
(a) Check valve (b) 4/2way valve (c) 4/3way valve (d) None

13.17 Ball or poppet checks are held against the check valve seat by a…….. -.
(a) Hydraulic force (b) Solenoid force (c) Spring (d) None

13.18 ……..is generally used as a bypass with filter -.
(a) Check valve (b) D.C. valve (c) Flow control valve (d) None

13.19 ……..is used as anti cavitations valve in vibration circuit of Tamping Unit. -.
(a) Relief valve (b) 3/2 valve (c) Check valve (d) None

13.20 The cracking pressure is determined by the strength of the……in a check valve. -.
(a) Spring (b) Hydraulic pressure (c) Mechanical power(d) None

Answer Sheet

Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.
13.01	**a**	**13.06**	**d**	**13.11**	**a**	**13.16**	**a**
13.02	**b**	**13.07**	**c**	**13.12**	**b**	**13.17**	**c**
13.03	**a**	**13.08**	**b**	**13.13**	**a**	**13.18**	**a**
13.04	**a**	**13.09**	**b**	**13.14**	**a**	**13.19**	**c**
13.05	**a**	**13.10**	**d**	**13.15**	**b**	**13.20**	**a**

Hydraulic & Pneumatics
Session: 14

14.01 …..…..is used to hold a load in mid position-
(a) Pilot operated check valve (b) Simple check valve
(c) Pressure control valve (d) Flow control valve

14.02 Reverse flow is possible through a check valve in…….
(a) Pilot operated check valve (POC) (b) Pilot operated DC valve
(c) Pressure control valve (d) None

14.03 The normal position of 4/3 way valve is generally….provided with pilot operated check valve.
(a) Neutral position (b) Tandem Centre (c) Opened condition (d) Floating condition

14.04 POC valves are used in……circuit-
(a) Tool tilting (b) Tamping unit lateral sliding
(c) Work drive of 08 DUO & UNO (d) Both a & b

14.05 ….valve is used in hook lifting-lowering circuit is Unimat- .
(a) Logic valve (b) POC valve (c) Pilot operated D.C. Valve (d) None

14.06 The normal position of 4/3 way valve used to control logic calve (Cartridge valve) is..
(a) P ⟶ A, B (b) P ⟶ T (c) A, B ⟶ T (d) Closed position

14.07 In construction, there are ……..poppet valves are provided in logic valve manifold.
(a) 1 (b) 2 (c) 3 (d) 4

Answer Sheet

Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.
14.01	**a**	**14.04**	**d**	**14.07**	**d**
14.02	**a**	**14.05**	**a**		
14.03	**d**	**14.06**	**a**		

Hydraulic & Pneumatics
Session: 15

15.01 Spool is stuck up in D.C. valve due to-
(a) Coil ineffective (b) Body parts defective (c) Spool stressed (d) All of these

15.02 Spool is not shifting due to-
(a) No electric supply (b) Coil burnt (c) Both 'a' & 'b' (d) None

15.03 Valve overheating takes place due to-
(a) System pressure too high (b) Wrong oil grade
(c) Faulty electric circuit (d) All of the above

15.04 Leakage at D.C. Valve is due to……-
(a) Connections not sealed (b) Wrong seals (c) Defective valves (d) All

Answer Sheet

Q. No.	Ans.	Q. No.	Ans.
15.01	**d**	**15.03**	**d**
15.02	**c**	**15.04**	**d**

Q.1 What is the function of a D.C. valve?

Q.2 Write the types of D.C. valve.

Q.3 What is the function of a check valve?

Q.4 Why is pilot operated D.C. valve used?

Q.5 Explain the working of P.O.C valve.

Q.6 Name the three ways to operate a four way valve.

Q.7 Write the reasons of spool sticking in D.C. valve.

Q.8 What is pilot choke?

Q.9 What is meant by pilot pressure & pilot drain?

Hydraulic & Pneumatics
Session: 16

16.01 ……..control & vary pressure, flow direction, acceleration & deceleration-
(a) Proportional valve (b) Relief valve (c) D.C. Valve (d) Flow control valve

16.02 In proportional valve output flow is…….to input signal.
(a) Proportional (b) Inversely Proportional (c) Double (d) Quadruple

16.03 Current range for proportional valve is-
(a) 0-15mA (b) 250-750mA (c) 0-650mA (d) 0-600mA

16.04 In 09-CSM, the current for tamping unit lowering & lifting respectively is-
(a) 0 & 250mA (b) 650mA & 600mA (c) 250mA & 750mA (d) None

16.05 To get a……..movement, ramp function is made which means gradually increasing or decreasing signal.
(a) Sudden & jerk (b) Smooth & shock free (c) Fast (d) Slow

16.06 ……..is used to operate tamping unit UP/DN cylinder and satellite drive motor-
(a) D. C. Valve (b) Servo Valve (c) Proportional Valve (d) Flow valve control

16.07 …….is used to pass neat & Clean oil to pilot stage of proportional valve-
(a) Suction filter (b) Return Filter (c) Servo filter (d) Proportional Filter

16.08 Proportional valve does not function due to……..
(a) Proportional solenoid defective (b) Electric circuit faulty
(c) Proportional filter clogged (d) All of the above.

Answer Sheet

Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.
16.01	**a**	**16.05**	**b**		
16.02	**a**	**16.06**	**c**		
16.03	**b**	**16.07**	**d**		
16.04	**c**	**16.08**	**d**		

Hydraulic & Pneumatics
Session: 17

17.01 In a……..small input signal causes a large output of hydraulic power.
(a) Servo valve (b) D.C. valve (c) Relief Valve (d) None

17.02 A low power control signal can produce output of several hundred horse power in a-
(a) Relief valve (b) D.C. Valve (c) Servo valve (d) Proportional valve

17.03 Maximum current is fed in servo valve-
(a) 15mA (b) 250mA (c) 650mA (d) 750mA

17.04 Servo valves are used for…….-
(a) Tamping unit lifting lowering (b) Track lifting-lining (c) Rail clamp (d) Work drive

17.05 …….filters are used for all the three servo valves used in track lifting-lining in tamping machines-
(a) Servo (b) Proportional (c) Return line (d) Suction line

17.06 Button type filters are also provided to cater neat & clean oil…….the servo valve-
(a) Inside (b) Out side (c) No filter (d) None

17.07 Oil cleanliness class NAS……should be maintained for servo valve.
(a) 1 (b) 5 (c) 8 (d) None

17.08 Before the fitment of……. flushing should be done.
(a) Servo filter (b) Proportional filter (c) Return filter (d) None

17.09 Spool shifts in servo valve is due to-
(a) Mechanical shifting (b) Hydraulic pressure difference (c) Electric current (d) None

17.10 Pressure difference is caused due to ……..in nozzle in servo valve-
(a) Area difference (b) Equal area (c) Current difference (d) None

17.11 Null is disturbed due to…….. is created in nozzles in servo valve by contaminants.
(a) Area difference (b) Current difference (c) Pressure difference (d) None

Q.1 How is the servo valve spool actuated?
Q.2 Explain ‘null adjustment’ in servo valve.
Q.3 Name the parts of a servo valve.
Q.4 Explain ‘Ramp function’ in proportional valve

Answer Sheet

Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.
17.01	**a**	**17.05**	**a**	**17.09**	**b**
17.02	**c**	**17.06**	**a**	**17.10**	**a**
17.03	**a**	**17.07**	**b**	**17.11**	**a**
17.04	**b**	**17.08**	**a**		

Hydraulic & Pneumatics
Session: 18

18.01 Flow control valves are used to control the…….. of actuator.
(a) Pressure (b) Direction (c) Speed (d) None

18.02 A flow control valve regulates fluid flow by many ways-
(a) Meter-in (b) Meter-out (c) Bleed off (d) All of the above

18.03 Fluid flow is regulated on the outlet side of the actuator by…….-
(a) Meter in (b) Meter-out (c) Bleed off (d) None

18.04 Fluid flow is regulated on the inlet side of the actuator by…….-
(a) Meter in (b) Meter-out (c) Bleed off (d) None

18.05 ……..is used where only a portion of the main flow is required to control the actuator- .
(a) Meter in (b) Meter-out (c) Bleed off (d) None

18.06 Flow control valves controls the flow by…….-
(a) Fixed orifice (b) Variable orifice (c) Both 'a' & 'b' (d) None

18.07 As the area of an orifice increases, the pressure drop …….
(a) Increases (b) Decreases (c) No effect (d) None

18.08 Fluid velocity decreases when area of an orifice……..
(a) Increases (b) Decreases (c) No effect (d) None

18.09 One way flow control valve has a ……for return flow of an actuator-
(a) Check valve (b) Fixed orifice (c) Variable orifice (d) None

18.10 In Duomatic……flow control valve is used in squeezing circuit-
(a) One way (b) two Way . (c) Fixed (d) None

18.11 …….flow control valve is provided in work drive circuit of 08-Duomatic & Unimat-3S-
(a) One way (b) two Way . (c) Fixed (d) None

Q.1 Why is flow control valve used?
Q.2 What is one way flow control valve?
Q.3 What is the differences between fixed & variable flow control valve.

Answer Sheet

Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.
18.01	**c**	**18.05**	**c**	**18.09**	**a**
18.02	**d**	**18.06**	**c**	**18.10**	**a**
18.03	**a**	**18.07**	**b**	**18.11**	**a**
18.04	**b**	**18.08**	**a**		

Hydraulic & Pneumatics
Session: 19 (Accumulator)

19.01 An ……..stores hydraulic fluid for the system under pressure.
(a) Accumulator (b) Pump (c) Relief valve (d) None

19.02 When charging a bladder accumulator charge the ……side first.
(a) Oil (b) Gas (c) both a&b (d) None

19.03 The type of gas charged accumulator used in tamping machine-
(a) Bladder (b) Diaphragm (c) Both (d) None

19.04 Function of an accumulator in a hydraulic circuit is-
(a) To store pressurized fluid (b) Absorb hydraulic shocks
(c) Supply fluid on demand (d) All of the above

19.05 Diaphragm accumulator is used in……
(a) Small squeezing circuit (b) Big squeezing circuit (c) Rail clamp circuit (d) None

19.06 Diaphragm accumulator should not be used for……..because the diaphragm flexes during operation-
(a) Low pressure (b) High pressure (c) Low flow T (d) None

19.07 Gas charged accumulators depend on the compression of a …. for their fluid capacity & pressure level.
(a) Oil (b) Gas (c) Both (d) None

19.08 A gas charged accumulator should be pre-charged while…….. of hydraulic oil
(a) Empty (b) Full (c) Both (d) Same as pressure

19.09 The gas pressure in accumulator is …….of maximum working pressure-
(a) 1/2 (b) 1/4 (c) 2/3 (d) Same as pressure

19.10 In 09-CSM, the N_2 Pressure & Oil capacity of accumulator provided for system circuit-
(a) 20bar, 1.6ltrs. (b) 100bar, 25ltrs. (c) 85bar, 32ltrs. (d) None

19.11 ……may be installed in a system to absorb shock or pressure surges due to the sudden stopping or reversing of oil flow-
(a) Accumulator (b) Relief valve (c) Pump . (d) None

Q. 1 Name three functions of an accumulator.
Q.2 Write types of accumulator.
Q.3 Write the N_2 pressure and oil capacity of accumulators used in 09-CSM.

Answer Sheet

Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.
19.01	**a**	**19.05**	**a**	**19.09**	**c**
19.02	**b**	**19.06**	**b**	**19.10**	**c**
19.03	**c**	**19.07**	**b**	**19.11**	**a**
19.04	**d**	**19.08**	**a**		

Hydraulic & Pneumatics
Session: 20 (Accumulator)

20.01 The device and to convert fluid pressure into straight line mechanical force is-
(a) Cylinder (b) Motor (c) Pump (d) None

20.02 A cylinder in which power strokes is in only one direction is -
(a) Single acting cylinder (b) Double acting cylinder
(c) Double rod cylinder Gas (d) None

20.03 Power stroke is in both directions, it is-
(a) Single acting cylinder (b) Double acting cylinder
(c) Double rod cylinder Gas (d) None

20.04 Double rod cylinder is double acting & have…….piston…….rods-
(a) 2, 3 (b) 1, 1 (c) 1, 2 (d) 2, 2

20.05 Double rod cylinder is also know as non-differential cylinder because it has …… areas on both sides of piston.
(a) Different (b) Equal (c) Both (d) None

20.06 Cushioning is provided in cylinder to……..-
(a) Decreased the speed of cylinder (b) Increase the speed of cylinder
(c) Prevent shock T (d) None

20.07 ……is used in motorized trolley of T-28 where collapsed length must be shorter.
(a) Double acting cylinder (b) Double rod cylinder
(c) Ram type cylinder (d) Telescopic cylinder

20.08 Ram type cylinder used in elevators, jacks & automobile hoists is a…….
(a) Single Acting cylinder (b) Double acting cylinder (c) Double rod cylinder (d) None

20.09 Ram type cylinder retracts by the force of …….on the load.
(a) Hydraulic (b) Gravity (c) Pneumatic (d) None

20.10 Track lifting cylinder in tamping machine is a-
(a) Single acting cylinder. (b) Double acting cylinder.
(c) Double rod cylinder. (d) None

20.11 ……is used in lining device in RM-80 BCM.-
(a) Single acting cylinder. (b) Double rod cylinder. (c) Ram type cylinder. (d) None

20.12 Cylinder mountings are-
(a) Trunnion mount (b) Clevis mount (c) Square flange mount. (d) all of the above

20.13 In Tamping Unit lifting lowering cylinder…….mounting used.
(a) Trunnion . (b) Clevis (c) Square flange (d) None

20.14 In track lifting cylinder……mounting used-
(a) Trunnion. (b) Clevis. (c) Square flange. (d) None

20.15 The formula, speed (inch/min) = GPM x $\frac{231}{\text{Effective piston area in inch}^2}$ is applied to get cylinder's-

(a) Speed. (b) Flow (c) Both. (d) None

Q. 1 What is cylinder?.
Q.2 How cylinder is tested before providing on machine?
Q.3 What are the cylinder mountings?
Q.4 What is the formula for calculating speed of cylinder.
Q.5 Name kinds of cylinder provided in machine & their uses.

Answer Sheet

Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.
20.01	**a**	**20.05**	**b**	**20.09**	**b**	**20.13**	**a**
20.02	**a**	**20.06**	**c**	**20.10**	**a**	**20.14**	**b**
20.03	**b**	**20.07**	**d**	**20.11**	**b**	**20.15**	**c**
20.04	**c**	**20.08**	**a**	**20.12**	**d**		

Hydraulic & Pneumatics
Session: 21

21.01 The torque of a hydraulic motor in a result of the fluid-
(a) Pressure (b) Flow (c) Speed (d) None

21.02 Hydraulic motors convert the…….. energy into……energy.
(a) Mechanical, Hydraulic (b) Hydraulic, Mechanical
(c) Hydraulic, Pneumatic (d) None

21.03 The kinetic energy of the fluid is converted into the……..of the fluid-
(a) Potential energy (b) Kinetic energy (c) Torque output (d) None

21.04 The pressure of the fluid admitted to the motor determines its…….output-
(a) Kinetic energy (b) Force or torque (c) Potential energy (d) None

21.05 The …..of a motor is the rotational force that it exerts on an object, causing the object to rotate.
(a) Speed (b) Flow (c) Torque (d) rpm

21.06 Rotation in gear motor is caused by……..acting on the gear teeth-
(a) Fluid flow (b) Fluid speed (c) Fluid pressure (d) None

21.07 A vane motor having two motor chambers is-
(a) Balanced (b) Unbalanced (c) Variable (d) None

21.08 Hydraulic motor need a starting torque……enough to start rotation while fully loaded-
(a) Small (b) Large (c) Equal (d) None

21.09 Rotation in vane motor is caused by…….acting on the exposed surfaces of rectangular vanes-
(a) Fluid flow (b) Fluid speed (c) Fluid pressure (d) None

21.10 …….torque is the turning force the motor exerts from a dead stop-
(a) Starting. (b) Running (c) Stalling. (d) None

21.11 ……torque is exerted when the motor is running & changes whenever there is a change in fluid pressure.
(a) Starting . (b) Running (c) Stalling (d) None

21.12 ……torque is the force necessary to stop the motor-
(a) Starting (b) Running (c) Stalling (d) None

21.13 Hydraulic motor is ……..actuator-
(a) Linear. (b) Rotary (c) Both (a) & (b). (d) None

21.14 Hydraulic motor are rated according to displacement (size), torque capacity and maximum ……..limitations-
(a) Flow (b) Pressure (c) Speed . (d) None

21.15 ……is the amount of fluid which the motor will accept in turning one revolution-
(a) Displacement (b) Pressure (c) Torque (d) None

21.16 Increase the pressure setting, the effect on torque available on motor shaft…….
(a) No effect (b) Decreases (c) Increases (d) None

21.17 Increase GPM, the effective torque available on motor shaft……..
(a) No effect (b) Increases (c) Decreases (d) None

21.18 High pressure at the inlet & low pressure at the outlet result in……..side loading on the shaft & gears in gear motor-
(a) High (b) Low (c) Equal (d) None

21.19 Hydraulic motor may be……-
(a) Unidirectional (b) Bidirectional (c) Variable (d) All of the above

21.20 ……motor is used for vibration in tamping unit-
(a) Unidirectional (b) Bidirectional (c) Variable (d) None

21.21 ……motor is used on work drive motor in 09-CSM & DUO.……-
(a) Unidirectional (b) Bidirectional (c) Variable (d) None

21.22 In the …….vane motor the pressure buildup at either port is directed to two interconnected chambers within the motor located 180^0 apart. Any side loads which are generated oppose & cancel each other -
(a) Balanced (b) In balanced (c) Both ‘a’ & ‘b’ (d) None

21.23 The……..is provided to hold the rotating unit (rotor) tightly sealed through pressure on its outer surface in a vane motor-
(a) Cam Ring (b) Pressure Plate (c) Rotor (d) None

Answer Sheet

Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.
21.01	**a**	**21.07**	**a**	**21.13**	**b**	**21.19**	**d**
21.02	**b**	**21.08**	**b**	**21.14**	**b**	**21.20**	**a**
21.03	**b**	**21.09**	**c**	**21.15**	**a**	**21.21**	**b**
21.04	**b**	**21.10**	**a**	**21.16**	**c**	**21.22**	**a**
21.05	**c**	**21.11**	**b**	**21.17**	**a**	**21.23**	**b**
21.06	**c**	**21.12**	**c**	**21.18**	**a**		

Hydraulic & Pneumatics
Session: 22

22.01 ……generate torque through pressure on the ends of reciprocating pistons operating in a cylinder block-
(a) Gear Motor (b) Vane Motor (c) Piston Motor (d) None

22.02 In axial piston motor the motor drive shaft and …….are centered on the same axis-
(a) Cylinder block (b) D.C. Valve (c) Swash plate (d) None

22.03 Pressure at the ends of the pistons in axial piston motor causes a reaction against a canted……. & drive the cylinder block & motor shaft-
(a) D.C. Valve (b) Swash plate (c) Cross relief valve (d) None

22.04 Oil under pressure at……exerts force on pistons, forcing them out of the cylinder block-
(a) Inlet (b) Outlet (c) Both 'a' & 'b' (d) None

22.05 ……..the swash plate angle increases the torque capability but reduces the drive shaft speed.
(a) Increasing (b) Decreasing (c) No angle (d) None

22.06 Variable displacement axial piston motor is provided in driving circuit of-
(a) RM-80 (b) FRM-80 (c) Kershaw BRM (d) All of the above

22.07 In…… motor the cylinder block & drive shaft are not in true alignment to each other-
(a) Axial piston (b) Bent axis piston (c) Vane (d) None

22.08 Oil at required pressure at inlet causes a thrust on piston in bent axis piston motor. Piston thrust on drive shaft flange results in……..on shaft.-
(a) Torque (b) Speed (c) Both 'a' & 'b' (d) None

22.09 Universal link maintains alignment so shaft and ……..always turn together in bent axis piston motor.-
(a) Pistons (b) Drive shaft flange (c) Cylinder block (d) None

22.10 ……. is used for vibration in screen in RM-80-
(a) Axial piston motor (b) Vane motor (c) Gear Motor (d) Bent axis motor

Q.1 Name type of hydraulic motors used in track machines.
Q.2 Define displacement & torque of a hydraulic motor.
Q.3 Why is bidirectional hydraulic motor externally drained?
Q.4 Name three kinds of motor torque.
Q.5 What is the reason of slow operation of a hydraulic motor?

Answer Sheet

Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.
22.01	**c**	**22.04**	**a**	**22.07**	**b**	**22.10**	**d**
22.02	**a**	**22.05**	**a**	**22.08**	**a**		
22.03	**b**	**22.06**	**d**	**22.09**	**c**		

Hydraulic & Pneumatics
Session: 23

23.01 Less input pressure in motor results in……vibration pressure in Tamping Unit-
(a) Less . (b) High (c) Moderate (d) None

23.02 Speed loss on motor output shaft is due to-
(a) Less pressure difference (b) High pressure difference
(c) Less incoming pressure (d) Both ‘a’ & ‘c’

Answer Sheet

Q. No.	Ans.	Q. No.	Ans.
23.01	**a**	**23.02**	**d**

Hydraulic & Pneumatics
Session: 24

24.01 ……may either heat or cool the hydraulic, fluid-
(a) Cooler (b) Heater (c) Heat Exchanger (d) None

24.02 Heat exchanger is called as……-
(a) Heater (b) Water cooler (c) Air cooler (d) All of above

24.03 In Track Machines……. is used to cool the oil-
(a) Air cooler (b) Water cooler (c) Heater (d) None

24.04 The……is pumped through tubes that bounded to fins made of aluminium or other metal
(a) Air (b) Fluid (c) Either 'a' or 'b' (d) None

24.05 The……cooler has a blower to increase the heat transfer-
(a) Water (b) Air (c) No angle (d) None

24.06 In.....hydraulic fluid is circulated through the unit & around the tubes containing the water-
(a) Water cooler (b) Air cooler (c) Heater (d) None

24.07 Thermostat or thermometer are used to check the operating-
(a) Pressure (b) Flow (c) Temperature (d) None

24.08 In Kershaw BRM, thermostat valve opens above 48.9^0C & oil goes to…….for cooling-
(a) Air cooler (b) Water cooler (c) Both 'a' & 'b' (d) None

24.09 Cooler is generally provided with ……..as a by pass valve-
(a) Relief valve (b) 4/2 way valve (c) Check valve (d) None

24.10 Cooler fins should be cleaned by-
(a)Compressed Air (b) Diesel oil (c) Water (d) None

24.11 These are…….. ..hyd. oil coolers provided in 09-CSM, 08-275-3S, 08 DUO-
(a) 2 . (b) 3 (c) 4 (d) none

24.12 Friction causes energy losses when the hydraulic fluid flows through the lines & components. This causes the hydraulic fluid to…….. -
(a) Cool (b) Heat up (c) No effect (d) None

Q.1 Define heat exchanger.
Q.2 What is the necessity of cleaning of air cooler?.
Q.3 Define thermostat.
Q.4 What is the pressure setting to run a cooler from motor?.
Q.5 What is the reason of slow operation of a hydraulic motor?

Answer Sheet

Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.
24.01	c	24.04	b	24.07	c	24.10	a
24.02	d	24.05	b	24.08	a	24.11	a
24.03	a	24.06	a	24.09	c	24.12	b

Pneumatics
Session: 01

01.01 The fluid in a fluid power system can be either a……or a……..
(a) Gas or liquid (b) Liquid only (c) Gas only (d) None

01.02 A system that uses a gas for transmitting force is called a……system-
(a) Hydraulic (b) Pneumatic (c) Either 'a' or 'b' (d) Both 'a' & 'b'

01.03 Work is performed by……..under pressure in the pneumatic system-
(a) Hydraulic fluid (b) Compressed air (c) Mechanical Power (d) None

01.04 The word……is derived from the Greek word for unseen gas-
(a) Pneumatic (b) Hydraulic (c) Either 'a' or 'b' (d) None

01.05 In a pneumatic system, force must be present at all times for the system to function. This force is……...
(a) Compressed air (b) Hydraulic fluid (c) (d) Both 'a' & 'b' (d) None

01.06 The pneumatic energy in compressed air system is produced by the…….
(a) Hydraulic pump (b) Compressor (c) Both 'a' & 'b' (d) None

01.07 The rapid intermingling of the molecules of one……with another is called diffusion-
(a) Gas (b) Oil (c) Either 'a' or 'b' (d) None

01.08 To prevent ……from rapid diffusing into surrounding air, they must be stored in closed containers- -
(a) Compressed gases (air) (b) Hydraulic fluid (c) both a& b (d) None

01.09 The property of a……that allows it to be stored in small spaces is its compressibility.-
(a) Gas (b) Oil (c) Either 'a' or 'b' (d) None

01.10 The pressure of a confined gas acting on the container wall is ……..in all directions-
(a) Different (b) Equal (c) Both 'a' & 'b' (d) Either 'a' or 'b'

01.11 Unlike liquids which are virtually incompressible air is readily…….& can be stored in large quantities in relatively small containers-
(a) Compressible. (b) Incompressible (c) Either 'a' or 'b' (d) None

01.12 The more the air is compressed, the high its…….becomes-
(a) Pressure (b) Temperature (c) Both 'a' & 'b' (d) None

01.13 ……..law states that the absolute pressure of a confined quantity of gas varies inversely as its volume, if its temp does not change.-
(a) Gas law (b) Charle's law (c) Boyle's law (d) None

01.14 $P_1V_1 = P_2V_2$ shows that even though the pressure and volume of a gas change, their total product is always…… -
(a) Equal or same (b) Different (c) Higher (d) None

01.15 ……law states that if the volume of a confined quantity of gas remains the same, the change in pressure of the gas varies with the charge in temperature of the gas" -
(a) Boyle's (b) Charle's (c) Gas (d) None

01.16 The ……..of air is a measure of its internal friction-
(a) Viscosity (b) Temperature (c) Pressure (d) None

01.17 In a compressed air system, the total energy (Kinetic and potential) always remains -
(a) Different (b) Constant (c) Either 'a' or 'b' (d) None

01.18 The amount of work done by a cylinder having a $50cm^2$ piston area & a 30cm stroke when operated at $4kg/cm^2$ equals…… -
(a) 6000Kg m (b) 6000kg cm (c) 600 Kg cm (d) None

01.19 The amount of force required to more an object is determined by the objects…… -
(a) Friction (b) Weight (c) Inertia (d) None

01.20 …… is defined as the amount of work done in a given length of time-
(a) Force (b) Kinetic energy (c) Potential energy (d) Power

01.21 …… energy is produced by an air compressor-
(a) Electrical (b) Kinetic (c) Pneumatic (d) Dynamic

01.22 Which of the following factors determines the amount of work done by a pneumatic cylinder?-
(a) Cylinder stroke (b) Air pressure (c) Cylinder bore (d) All of the above

01.23 What happens when heat is applied to gas contained in a cylinder?-
(a) Pressure increase (b) Volume increase (c) Cylinder expands (d) All of the above

01.24 The ideal air flow in a pneumatic system is called-
(a) Laminar flow (b) Turbulent flow (c) Either 'a' or 'b' (d) None

01.25 The force that permits a small amount of pressure to move a larger object is called-
(a) Power differential (b) Power ratio (c) Pneumatic leverage(d) Pneumatic power

01.26 …..Symbol shows the compressor-
(a) Circle (b) Square (c) Either 'a' or 'b' (d) None

01.27 Following components consist …….. a square symbol-
(a) Water separator (b) Air dryer (c) Air-oiler (d) All of the above

01.28 4/3 way valve has……position-
(a) 1 (b) 2 (c) 3 (d) 4

01.29 4/2 way valve has……position-
(a) 1 (b) 2 (c) 3 (d) 4

01.30 D.C. valve symbols are made in……-
(a) Square (b) Circle (c) Triangle (d) None

01.31 Pneumatic power is used in……-
(a) Chord tension (b) Application of datum
(c) Application of brakes (d) All of the above

01.32 Satellite pinion is engaged with gear by……..power in 09-CSM & 09-3x-
(a) Hydraulic (b) Pneumatic (c) Electrical (d) None

01.33 Engine rpm is raised by ……..power-
(a) Pneumatic (b) Hydraulic (c) Electrical (d) None

01.34 Tamping unit & lifting unit is locked/unlocked by……..power-
(a) Hydraulic (b) Pneumatic (c) Electrical (d) Mechanical

01.35 Bogies (FB, LB, MB, RB) are locked/unlocked & lifted/lowered by…….-
(a) Pneumatic (b) Hydraulic (c) Mechanical (d) Electrical

01.36 Dog clutch is engaged by pneumatic power in 09-CSM, 09-3X, Unimat during…….-
(a) Travel drive (b) Work Drive (c) Either 'a' or 'b' (d) None

01.37 The greasing in corner rollers on BCM is done by……..operated pump…….-
(a) Electrical (b) Hydraulic (c) Pneumatics (d) None

01.38 Pneumatic power is used for application of…….-
(a) Horn (b) Clapper cylinder (c) Either 'a' or 'b' (d) None

01.39 The word pneumatic (Greek Word) means…….-
(a) Oil (b) Unseen gas (c) Either 'a' or 'b' (d) None

Q.1 Define Boyle's law & Charle's law.
Q.2 Define 'diffusion'.
Q.3 Define gas law.
Q.4 What does the pneumatic mean?.
Q.5 What are the uses of air in track machine?
Q.6 Make the symbol of water separator, air oiler, air dryer, air compressor, cooling coil.

Answer Sheet

Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.
01.01	**a**	**01.11**	**a**	**01.21**	**c**	**01.31**	**d**
01.02	**b**	**01.12**	**c**	**01.22**	**d**	**01.32**	**b**
01.03	**b**	**01.13**	**c**	**01.23**	**a**	**01.33**	**a**
01.04	**a**	**01.14**	**a**	**01.24**	**a**	**01.34**	**b**
01.05	**a**	**01.15**	**b**	**01.25**	**c**	**01.35**	**a**
01.06	**b**	**01.16**	**a**	**01.26**	**a**	**01.36**	**b**
01.07	**a**	**01.17**	**b**	**01.27**	**d**	**01.37**	**c**
01.08	**a**	**01.18**	**b**	**01.28**	**c**	**01.38**	**c**
01.09	**a**	**01.19**	**c**	**01.29**	**b**	**01.39**	**b**
01.10	**b**	**01.20**	**d**	**01.30**	**a**		

Pneumatics
Session: 02

02.01 As a compressor increases the air pressure, it also reduces the air……-
(a) Volume (b) Temperature (c) Speed (d) None of the above

02.02 The cooling of compressor is done by the use of …….-
(a) Air (b) Water (c) Both 'a' or 'b' (d) None

02.03 ……compressors are commonly used in pneumatic system-
(a) Positive displacement (b) Non positive displacement (c) Either 'a' or 'b' (d) None

02.04 A compressor that draws in air at atmospheric pressure & compresses it to its final pressure in one stroke, is called a ……..compressor-
(a) Single stage (b) Multistage (c) Both 'a' or 'b' (d) None

02.05 A…compressor compresses air in more than one step.
(a) Single stage (b) Multi Stage (c) Either 'a' or 'b' (d) None

02.06 A ……..compressor compresses air in more than one step-
(a) Single stage (b) Multi stage (c) Either 'a' or 'b' (d) None

02.07 …….compressors are more economical for pressures higher than 100PSI.-
(a) Single stage (b) Multi stage (c) Either 'a' or 'b' (d) None

02.08 The prime mover for the compressor is……in track machine-
(a) Hydraulic pump (b) Electrical motor (c) Engine (d) None

02.09 ……compressor are used for pneumatic power system in track machine.-
(a) Reciprocating (b) Rotary (c) Both 'a' or 'b' (d) None

02.10 The…….efficiency of an air compressor is improved by cylinders that have fins-
(a) Cooling (b) Heating (c) Both 'a' & 'b' (d) None

02.11 Air cooled compressors are usually constructed with-
(a) Oversized pistons. (b) Large oil reservoirs (c) Cooling fins (d) Positive fan cooling

02.12 ……can be used to lubricate a compressor-
(a) Splash lubrication (b) Pressurized lubrication(c) Both 'a' & 'b' (d) None

02.13 ……..is used to cool down the compressed air-
(a) Safety valve (b) Air dryer (c) Cooling coil (d) None

02.14 Cooling coil is a helical…….tube-
(a) Copper (b) Aluminium (c) Brass (d) None

02.15 Excess air is released to atmosphere when air pressure is exceeded the setting value of -
(a) Pressure reducing valve (b) Safety valve (c) Brake valve (d) None

02.16 Air pressure is set ……bar at safety valve-
(a) 3.8 (b) 7-8 (c) 20 (d) 100

02.17 ……enters into the air network through the air intake of the compressor-
(a) Water (b) Lub. Oil (c) Air (d) None

02.18 The accumulation of condensate (water) depends largely on the…….. -
(a) Absolute humidity (b) Relative air humidity (c) Either ‘a’ or ‘b’ (d) None

02.19 The …… is dependent on the air temperature and the weather condition-
(a) Absolute Humidity (b) Relative air humidity(c) Both ‘a’ or ‘b’ (d) None

02.20 The…… is the mass of water vapour, actually contained in $1m^3$ of air-
(a) Absolute humidity (b) Relative air humidity(c) Both ‘a’ or ‘b’ (d) None

02.21 The..…is the mass of water vapour, which $1m^3$ of air can absorb at the respective temperature-
(a) Relative humidity (b) Absolute humidity (c) Solution quantity (d) None

02.22 Say about the formula- Relative humidity = $\frac{\text{absolute humidity}}{\text{Saturation quantity}}$ X 100%
(a) Correct (b) Incorrect (c) Cannot say (d) None

02.23 The dew point temperature is the temperature at which relative humidity is-
(a) 0% (b) 50% (c) 100% (d) 200%

02.24 The……..the dew point the more water will condense and reduce the amount entrapped in the air-
(a) Lower (b) Higher (c) Either ‘a’ or ‘b’ (d) None

02.25 The service life of pneumatic system is considerably…….if excessive moisture is carried through the air system to the components-
(a) Increased (b) Reduced (c) No effect (d) None

02.26 ……dehumidifies the air by means of a granulate material (gel) consisting almost entirely of…….-
(a) Silicon dioxide (b) Clay (c) Calcium oxide (d) None

02.27 The drying agent in air dryer is a granular material (gel) consisting almost entirely of-
(a) Silicon dioxide (b) Clay (c) Calcium oxide (d) None

Answer Sheet

Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.
02.01	**a**	**02.08**	**c**	**02.15**	**b**	**02.22**	**a**
02.02	**c**	**02.09**	**a**	**02.16**	**b**	**02.23**	**c**
02.03	**a**	**02.10**	**a**	**02.17**	**a**	**02.24**	**a**
02.04	**a**	**02.11**	**c**	**02.18**	**b**	**02.25**	**b**
02.05	**b**	**02.12**	**c**	**02.19**	**b**	**02.26**	**b**
02.06	**a**	**02.13**	**c**	**02.20**	**a**	**02.27**	**a**
02.07	**b**	**02.14**	**a**	**02.21**	**c**		

Pneumatics
Session: 03

03.01 Moisture and iron from rust because of a ……..reaction-
(a) Chemical (b) Physical (c) No reaction (d) None

03.02 The most common method used to remove……..from compressed air is by condensation-
(a) Contaminants (b) Water vapour (c) Solid substance (d) None

03.03 Condensed moisture is usually removed from the system by a…….-
(a) Air dryer (b) Water separator (c) Air oiler (d) None

03.04 ……cause the air to swirl or make sharp changes in the direction of flow to separate the water particles from the air-
(a) Water separator (b) Air dryer (c)) Air dryer (d) None

03.05 The swirling action causes the heavier moisture & oil particles to be deposited on outside wall. The particles then flow down into the moisture trap at the bottom of the…….
(a) Water separator (b) Air dryer (c)) Air oiler (d) None

03.06 As the pressure of the air increases, the ability of the air to retain moisture…….if temperature remains constant -
(a) Increases (b) Decreases (c) No effect (d) None

03.07 If the temperature increases as the pressure increases then the ability of the compressed air to hold moisture also……...
(a) Increases (b) Decreases (c) Either ‘a’ or ‘b’ (d) None

03.08 Most pneumatic components such as valves, cylinders require……air to reduce wear & corrosion-
(a) Dry (b) Lubricated (c) Either ‘a’ or ‘b’ (d) None

03.09 The dry air is lubricated through…….-
(a) Air oiler (b) Air dryer (c) Water separator (d) None

03.10 The…….. used to lubricate pneumatic equipments must be free of contaminants i.e. dirt & moisture.-
(a) Air (b) Oil (c) Either ‘a’ & ‘b’ (d) None

03.11 …….Valves in a pneumatic system direct the air flow in compressed air lines to start, stop or reverse the direction of motion of pneumatic cylinders & other equipment -
(a) Direction control (b) Pressure control (c) Flow control (d) None

03.12 D. C. valves can be operated manually or automatically by-
(a) Mechanically (b) Electrical signals (c) Compressed air (d) All of the above

03.13 D.C. valves have…..connecting ports in pneumatics system-
(a) 2 Way (b) 3 Way (c) 4 Way (d) 5 Way (e) All of the above

03.14 D.C. valves have…..type of control element -
(a) Poppet (b) Spool (c) Rotary (d) all of the above

03.15 Check valves use balls, poppets etc. & are used to ensure air flow in…….direction -
(a) One (b) Both (c) Both ‘a’ & ‘b’ (d) None

03.16 The lowest pressure that opens check valve is called the…….& is determined by the force of the spring-
(a) Overriding pressure (b) Cracking pressure (c)Excess pressure (d) None

03.17 A…….valve is used where cylinder makes short, quick strokes & has to be returned quickly-
(a) Safety valve (b) Check valve (c) Quick release valve (d) None

03.18 Pneumatic……convert the pressure & movement of compressed air ito straight line mech. Force & motion-
(a) Cylinders (b) Motors (c) D.C. Valve (d) None

03.19 The ….the air pressure on the piston, the higher the output mechanical force-
(a) Higher (b) Lower (c) Either 'a' or 'b' (d) None

03.20 The pneumatic cylinders used in track machines are mostly-
(a) Single acting (b) Double Acting (c) Both 'a' & 'b' (d) None

03.21 The …….cylinder has a power stroke in one direction only-
(a) Single acting (b) Double Acting (c) Double rod (d) None

03.22 In single acting cylinder, a small air vent should be installed in the……..side of the cylinder to allow air at atmospheric pressure to fill the space as the cylinder operates
(a) Power (b) Dead (c) Both 'a' & 'b' (d) None

03.23 Small air vent, provided in…….acting cylinder, prevent the piston seals & packings from drying out and also prevents an air lock from occurring-
(a) Single acting (b) Double Acting (c) Double rod (d) None

03.24 The brake cylinder in track machine is……..acting cylinder with spring-
(a) Single acting (b) Double Acting (c) Double rod (d) None

03.25 The spring is only strong enough to overcome internal friction and exhaust the air from the……cylinder.-
(a) Single acting with spring (b) Double Acting (c) Double rod (d) None

03.26 The speed of the cylinder in determined by the……in pressure system-
(a) Air pressure (b) Air flow (c) Air temperature (d) None

03.27 Pneumatic cylinders resemble hydraulic cylinders but do not require……..lines-
(a) Inlet (b) Return (c) Pilot (d) None

03.28 Air should flow through a pipe in a ……..flow-
(a) Laminar (b) Turbulent (c) Both 'a' & 'b' (d) None

03.29 The size of an air line should be selected so only a small…….drop occurs-
(a) Pressure (b) Temperature (c) Velocity (d) None

03.30 ……affect the pressure drop-
(a) Volume of air (b) Air pressure (c) Length of pipe
(d) No. of fittings (e) All of the above.

03.31 Hoses are used in pneumatic system to provide……..connections between equipment-
(a) Flexible (b) Rigid (c) Either 'a' or 'b' (d) No. of fitting

03.32 The…….. used in pneumatic system are of 6.3 & 12.6 mm dia-
(a) Hoses (b) Steel pipe (c) Either ‘a’ or ‘b’ (d) None

03.33 The pneumatic hoses are reinforced with-
(a) Steel wire braids (b) Synthetic yarn (c) Spiral wire wrapped (d) None

Answer Sheet

Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.
03.01	**a**	**03.10**	**b**	**03.19**	**a**	**03.28**	**a**
03.02	**b**	**03.11**	**a**	**03.20**	**c**	**03.29**	**a**
03.03	**b**	**03.12**	**d**	**03.21**	**a**	**03.30**	**e**
03.04	**a**	**03.13**	**e**	**03.22**	**b**	**03.31**	**a**
03.05	**a**	**03.14**	**d**	**03.23**	**a**	**03.32**	**a**
03.06	**b**	**03.15**	**a**	**03.24**	**a**	**03.33**	**b**
03.07	**a**	**03.16**	**b**	**03.25**	**a**		
03.08	**b**	**03.17**	**c**	**03.26**	**b**		
03.09	**a**	**03.18**	**a**	**03.27**	**b**		

Pneumatics
Session: 04

04.01 ……..Air is used in pneumatic system-
(a) Atmospheric (b) Compressed (c) Water laiden (d) None

04.02 Brake pressure (approx 4 bar) is set at……-
(a) Safety value (b) Pressure reducing value (c) Air compressor (d) None

04.03 The circuits used in brake circuit are-
(a) Series circuit (b) Parallel circuit (c) Both 'a' & 'b' (d) None

04.04 In normal condition brake is…….-
(a) Applied (b) Released (c)) Either 'a' or 'b' (d) None

04.05 Parking brake/hand brake is applied by…….
(a) Pneumatic power (b) Manually (c)) Hydraulic power (d) None

04.06 Brake cylinders are operated by……power in running mode in tamping machines -
(a) Pneumatic (b) Hand wheel (c) Hydraulic (d) None

04.07 ……...valve is provided for quick return of brake cylinder.
(a) Quick release (b) Safety valve (c) Pressure reducing valve (d) None

04.08 The pointer shows the brake pressure in dual pressure gauge-
(a) Red (b) White (c) Either 'a' or 'b' (d) Both 'a' or 'b'

04.09 Brakes can be applied by……-
(a) Pneumatic power (b) Manually (c)) Hydraulic power (d) All of the above

04.10 The gap between brake shoe and wheel tread shall be maintained…….
(a) 10-12mm (b) 13mm (c) 3-5mm (d) None

04.11 Brake linings are changed when their thickness of 35mm (new) has diminished to…..mm.
(a) 10mm (b) 5mm (c) 2mm (d) None

04.12 Change worn brake shoe at any points for minimum thickness of……
(a) 5mm (b) 10mm (c) 13mm (d) None

04.13 Brake valve should be checked regularly for its-
(a) Leakages (b) Spring (c) Back pressure disc (d) All of the above

04.14 …….braking is applied on satellite axle in 09-CSM & the brake pressure is ….. &…..bar.
(a) hyd, 30,70 (b) pneumatic, 2.5, 3.5 (c) manual, 35, 110 (d) None

Answer Sheet

Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.
04.01	**b**	**04.05**	b	**04.09**	**d**	**04.13**	**d**
04.02	**b**	**04.06**	a	**04.10**	**c**	**04.14**	**b**
04.03	**c**	**04.07**	a	**04.11**	**b**		
04.04	**a**	**04.08**	a	**04.12**	**c**		

Pneumatics
Session: 05

05.01 The circuits used in pneumatic working system are…….-
(a) Series Circuit (b) Parallel circuit (c) Both ‘a’ & ‘b’ (d) None

05.02 The normal condition of D.C. Valve used to blow horn is-
(a) closed (b) opened (c) Both ‘a’ & ‘b’(d) None

05.03 The valve is operated……to blow pneumatic horn-
(a) Manually (b) By solenoid (c) By pneumatic power (d) None

05.04 Pneumatic power is applied for different uses such as chord tension, engine rpm acceleration/deceleration etc through……..
(a) D.C. Valve (b) Direct (c)) Either ‘a’ or ‘b’ (d) None

Answer Sheet

Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.
05.01	**b**	**05.02**	**b**	**05.03**	**a**	**05.04**	**a**

Pneumatics
Session: 06

06.01 The causes of insufficient air volume are-
(a) System leakage excessive (b) Compressor too small
(c) Clogged intake filters (d) All of the above

06.02 Low air pressure is caused due to-
(a) System leakage excessive (b) Compressor discharge pressure is low
(c) Both 'a' & 'b' (d) None

06.03 A planned maintenance programme ensures that equipment checks are carried out on a……..basis-
(a) Regular (b) Need (c) Frequently (d) None

06.04 Early failure of pneumatic components is due to-
(a) Less air pressure (b) Lock of lubrication (c) Excessive moisture (d) Both 'a' & 'b'

06.05 The component in a reciprocating compressor which require the most maintenance are the…….
(a) Intake valve (b) Discharge valve (c)) Crank shaft (d) Both 'a' & 'b'

06.06 Intake air filter should be checked for blockage at-
(a) Daily (b) 50hrs (c) 100hrs (d) 200hrs

06.07 Check the oil level in the compressor at-.
(a) Daily (b) 50hrs (c) 100hrs (d) 200hrs

06.08 Check lubricating oil level in the air oiler at-
(a) Daily (b) 50hrs (c) 100hrs (d) 200hrs

06.09 The causes of excess oil in the pneumatic system are-.
(a) Oil coming from air compressor (b) Malfunctioning air lubricator
(c) Both 'a' & 'b' (d) None

06.10 Reasons of moistures in the pneumatic system are-
(a) Defective moisture separator (b) Defective drip cup
(c) Defective Air dryer (d) All of the above

06.11 The methods are used to cool a compressor……
(a) Lubrication (b) Conduction through cylinder walls & fins
(c) Incoming air (d) All of the above

06.12 Burned……..in a reciprocating compressor are the result of heat and the accumulation of carbon deposits-
(a) Intake valve (b) Discharge valve (c) Piston (d) None of the above.

06.13 If a D.C.valve is not receiving air, the reasons are-
(a) Compressor not supplying air (b) Plugged ports (c) Leaked hose (d) All of the above

06.14 The reasons for sticky & inoperative control valves are-.
(a) Inoperative solenoid (b) Contaminants (c) Improper lubrication (d) All

06.15 The types of misalignment occur in pneumatic cylinder are-
(a) External (b) Internal (c) Both ‘a’ & ‘b’ (d) None

06.16 The part which is replaced most frequently in a cylinder is-
(a) Seal (b) Gland bush (c) Piston ’ (d) None

06.17 The purpose of plating the inside of cylinder tubes are-
(a) Improve the wear life (b) Reduce corrosion (c) Both ‘a’ & ‘b’ (d) None

06.18 When troubleshooting a cylinder for external misalignment, first disconnect the-
(a) Load (b) Piston rod (c) Air supply (d) None

06.19 Good cylinder performance depends on accurate mounting and……of the cylinder-
(a) Air pressure (b) Alignment (c) Lubrication (d) All of the above

06.20 Pneumatic pipes get damaged easily due to-
(a) Excessive moisture (b) Twisting (c) Faulty connection (d) All of the above

Answer Sheet

Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.
06.01	**d**	**06.06**	a	**06.11**	**d**	**06.16**	**a**
06.02	**c**	**06.07**	a	**04.12**	**b**	**06.17**	**c**
06.03	**a**	**04.08**	a	**06.13**	**d**	**06.18**	**a**
04.04	**d**	**06.09**	**c**	**06.14**	**d**	**06.19**	**d**
06.05	**d**	**06.10**	**d**	**06.15**	**c**	**06.20**	**d**

Track Machines & Working Principle
(B.R.M. Kershaw Make)
Session: 33

33.01 ……..makes ballast profile & transfers ballast from one end of the track to the other end & centre of the track-
(a) BRM (b) BCM (c) SBCM (d) UTV

33.02 ……collects the ballast towards sleeper end-
(a) Wings (b) Centre Plough (c) Broom (d) None

33.03 ……..Transfers ballast from one end to other end of track-
(a) Wings (b) Centre plough (c) Broom (d) None

33.04 ……..sweeps the excess ballast from fastenings & crib-
(a) Wings (b) Centre plough (c) Broom (d) None

33.05 ……..……can work in both directions-
(a) BCM (b) SBCM (c)) BRM (d) None

33.06 The wings template can be turned by extending & retracting the cylinder at-
(a) 30^0 (b) 45^0 (c) 60^0 (d) None

33.07 The broom is rotated by……giving hydraulic energy by……..pump-.
(a) Hydraulic motor, 45GPM (b) Cylinder, 45GPM
(c) Hydraulic motor, 21 GPM (d) None

33.08 The RPM of broom motor is-
(a) 1000 (b) 550 (c) 244 (d) None

33.09 The length of solid cylindrical rubber pieces of broom is-.
(a) 256mm (b) 356mm (c) 456mm (d) None

33.10 Wing angle can vary from-
(a) 70^0 to 0^0 (b) 35^0 to 0^0 (c) 180^0 to 0^0 (d) None

33.11 Centre plough templates are operated independently by-
(a) Motor (b) Cylinder (c) Either ‘a’ & ‘b’ (d) None

33.12 The engine provided on Kershaw BRM is……-
(a) KT1150 (b) NTA855L (c) NT743 (d) HA694

33.13 The rated HP @1800rpm is……
(a) 265 (b) 273 (c) 453 (d) None

33.14 The length of Kershaw BRM over buffers is……..mm.
(a) 13313 (b) 10389 (c) 15000 (d) None

33.15 Double vane pump’s flow rate is……..GPM pump in Kershaw BRM.-
(a) 45 & 21 (b) 38 & 17 (c) 20 & 14 (d) None

33.16 Emergency pump is provided for……..-
(a) Operating of wings (b) To run broom (c) for backup (d) None

33.17 Broom drive pressure is set at……bar-
(a) 379 (b) 138 (c) 172 (d) None

33.18 Wings & centre plough pressure is set at……bar-
(a) 379 (b) 138 (c) 172 (d) None

33.19 Driving pressure is set at ……..bar--
((a) 379 (b) 138 (c) 172 (d) None

33.20 The capacity of hydraulic tanks is……ltrs.
(a) 511 (b) 617 (c) 1000 (d) None

33.21 The capacity of HSD oil tank is…….ltrs..
(a) 511 (b) 617 (c) 1000 (d) 1200

33.22 The capacity of pump drive gear box is……..ltrs.
(a) 4.2 (b) 5.2 (c) 11.3 (d) None

33.23 The capacity of transmission gear box is……..ltrs.
(a) 4.2 (b) 5.2 (c) 19 (d) None

33.24 The capacity of engine sump is……..ltrs.
(a) 4.2 (b) 42 (c) 19 (d) None

33.25 2 Nos. batteries of 205A.H. connected in……
(a) Series (b) Parallel (c) both 'a' & 'b' (d) None

33.26 Alternator (01 No.) of……ampere is provided in Kershaw BRM.
(a) 10 (b) 30 (c) 50 (d) None

33.27 ……cylinder air compressor is provided in BRM which capacity is 0.38m^3/min.
(a) Single (b) Double (c) Tripple (d) None

33.28 The wing can be adjusted for making slope from……-
(a) 1:1 to 2½:1 (b) 1:1 to 4:1 (c) 1:1 to 1½ :1 (d) None

33.29 The displacement of engine model No. NTA 743 provided in BRM is …….cubic inch-
(a) 822 (b) 743 (c) 1150 (d) None

33.30 ……. is provided to pull material in or plow away material upto 203mm below bottom of tie-
(a) Wing (b) Centre plough (c) Broom (d) None

33.31 The distance between centre of track & outer edge of……..is 3150mm-
(a) Wing (b) Centre plough (c) Broom (d) None

33.32 Max. toe line with……templates extended out of 45^0 is 3658mm from the centre of track.
(a) Centre plough (b) Wing (c) either 'a' & 'b' (d) None

33.33 The volume of …….is 01 cubic metre.
(a) Broom (b) Centre Plough (c) Wing (d) None

33.34 Lower ……templates to within 6.4mm of the top of the rails.

(a) Wing (b) Centre Plough (c) either 'a' & 'b' (d) None

33.35 The clear distance between top of the rail &…….. should remain 5mm.
(a) Wing (b) Centre Plough (c) Broom (d) None

33.36 …….engine's bore dia is 130mm & stroke length is 152mm provided in Kershaw BRM -
(a) NT 743 (b) NTA855L (c) KT1150 (d) None

33.37 The total……..of BRM is 3617mm above rail level-
(a) Length (b) Width (c) Height (d) None

33.38 The total……..of machine is 3200mm-
(a) Length (b) Width (c) Height (d) None

33.39 The total……..of Plasser BRM is 11020mm-
(a) Length (b) Width (c) Height (d) None

33.40 The total……..of Plasser BRM with AC is 3530mm & without AC is 3220mm.-
(a) Length (b) Width (c) Height (d) None

33.41 The ……..of Plasser BRM with AC is 3185mm.-
(a) Length (b) Width (c) Height (d) None

33.42 The wheel dia of Plasser BRM is ……mm.-
(a) 838 (b) 730 (c) 1230 (d) None

33.43 The engine model No. of Plasser BRM is …….-
(a) NT743 (b) NTA855 (c) KT1150 (d) 6CTA 8.3.L

33.44 …….. engine's bore dia is 114mm and length of stroke is 135mm.-
(a) 6CTA8.3-L (b) NT743 (c) NTA855 (d) None

33.45 The displacement of engine model No. ….is 8.27 ltr i.e. 504.7 cubic inch. `-
(a) NT743 (b) NTA855 (c) KT1150L (d) 6CTA8.3-L

33.46 The H.P of Engine Model No. ….is 194KW @ 2200rpm.-
(a) 6CTA8.3-L (b) MWMTBD232 (c) Deutz Engine (d) NT743

33.47 The cooling system of engine 6CTA8.3L is…...-
(a) Air cooled (b) Water cooled (c) either 'a' & 'b' (d) None

33.48 The pumps provided on Plasser BRM are.-
(a) Tipple pump 20, 14 & 10GPM (b) Variable displacement pump 125c.c/rev.
(c) Double pump 45 & 21GPM (d) Both 'a' & 'b'

33.49 Variable displacement pump is provided in Plasser BRM to operate-
(a) Driving Motor (b) Cooler fan motor (c) Brush unit motor (d) Shoulder plough

33.50 10 GPM pump in Plasser BRM is provided to operate-
(a) Shoulder Plough UP/DN (b) Front plough UP/DN
(c) Brush unit UP/DN (d) All of the above

33.51 ……GPM pump is provided to run rotary brush unit motor-
(a) 20 GPM (b) 14 GPM (c) 10 GPM (d) 125cc/rev.

33.52 The rpm of…….motor is 300 in Plasser BRM-
(a) Cooler fan (b) Cross conveyor belt (c) Brush unit (d) None

33.53 The capacity of both…tanks is 450 ltr. In Plasser BRM-
(a) Fuel (b) Hydraulic oil (c) Engine Pump (d) Both 'a' & 'b'

33.54 The capacity of…… is 4.0ltr in Plasser BRM-
(a) Pump drive gear box (b) Engine sump (c) Engine radiator (d) Axle gear box

33.55 The capacity of…… is 25ltr in Plasser BRM-
(a) Engine radiator (b) Engine sump (c) Both 'a' & 'b' (d) Axle gear box

33.56 The capacity of…… is 5.5ltr in Plasser BRM-
(a) Engine sump (b) Engine radiator (c) Each axle gear box d) None

33.57 The alternator rating is……amp. in Plasser BRM-
(a) 30 (b) 55 (c) 75 (d) None

33.58 The batteries rating provided in Plasser BRM is……connected in series-
(a) 120AH (b) 180AH (c) 205AH (d) None

Answer Sheet

Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.
33.01	**a**	**33.16**	**c**	**33.31**	**a**	**33.46**	**a**
33.02	**a**	**33.17**	**b**	**33.32**	**b**	**33.47**	**b**
33.03	**b**	**33.18**	**c**	**33.33**	**c**	**33.48**	**d**
33.04	**c**	**33.19**	**a**	**33.34**	**b**	**33.49**	**a**
33.05	**c**	**33.20**	**a**	**33.35**	**c**	**33.50**	**d**
33.06	**b**	**33.21**	**b**	**33.36**	**a**	**33.51**	**a**
33.07	**a**	**33.22**	**a**	**33.37**	**c**	**33.52**	**c**
33.08	**c**	**33.23**	**b**	**33.38**	**b**	**33.53**	**d**
33.09	**b**	**33.24**	**b**	**33.39**	**a**	**33.54**	**a**
33.10	**a**	**33.25**	**a**	**33.40**	**c**	**33.55**	**b**
33.11	**b**	**33.26**	**b**	**33.41**	**b**	**33.56**	**c**
33.12	**c**	**33.27**	**a**	**33.42**	**b**	**33.57**	**b**
33.13	a	**33.28**	**a**	**33.43**	**d**	**33.58**	**b**
33.14	**b**	**33.29**	**b**	**33.44**	**a**		
33.15	**a**	**33.30**	**a**	**33.45**	**d**		

Track Machines & Working Principle
(B.R.M.)
Session: 34

34.01 AA4V is the model no. of ……in Kershaw BRM-
(a) Hydrostatic pump (b) Hydrostatic Motor (c) Fixed displacement pump (d) None

34.02 AA6VM is the model no. of ……in Kershaw BRM-
(a) Hydrostatic pump (b) Hydrostatic Motor (c) Broom Motor (d) None

34.03 ……..drive is used in Kershaw BRM.-
(a) Mechanical (b) Hydrostatic (c) Electromech (d) None

34.04 The……..is mounted on pump drive gear box in Kershaw BRM-
(a) Variable displacement pump (b) Variable displacement propelling motor
(c) Fixed displacement pump (d) Both 'a' & 'b'

34.05 The…….…….is mounted on two speed transmission gear box in Kershaw BRM-
(a) Variable displacement pump (b) Variable displacement propelling motor
(c) Broom motor (d) Fixed displacement pump.

34.06 The hydrostatic propelling system is a ……loop system in Kershaw BRM.
(a) Open (b) Closed (c) Either 'a' & 'b' (d) None

34.07 ……..pump, which is mounted on the rear of the variable displacement pump, supplies oil to the hydrostatic loop to keep it charged.-.
(a) Charge (b) Vane pump (c) Variable displacement pump (d) None

34.08 In hydrostatic propelling system, the oil leakage from the hydrostatic loop is carried by the case drains of the hydrostatic pump & motor back to the…….-
(a) Pump (b) Motor (c) Reservoir (d) None

34.09 The……has a pressure compensated control which automatically changes motor displacement when pressure in the system increases or decreases in Kershaw BRM-.
(a) Variable displacement pump (b) Fixed displacement pump
(c) Variable displacement motor (d) Either 'a' & 'b'

34.10 The system pressure at which the……in displacement starts is referred to as the motor threshold pressure.
(a) Increase (b) Decrease (c) Either 'a' & 'b' (d) None

34.11 Pressure above the motor threshold pressure cause the motor to shift towards full displacement which will give the machine……tractive effort-
(a) Min (b) Max. (c) Either 'a' & 'b' (d) None

34.12 Max. Torque control valve is switched on to hold the……..at max. displacement giving the machine max. tractive effort in Kershaw BRM-
(a) Hydrostatic motor (b) Variable displacement pump (c) Broom Motor (d) None

34.13 Hydraulic power from……is required to operate the transmission disconnect cylinder during towing of Kershaw BRM.-
(a) Emergency pump (b) Hydrostatic transmission charge pump
(c) Either 'a' & 'b' (d) None

34.14 …….is provided one on each axle in Plasser BRM-.
(a) Variable pump (b) Drive Motor (c) Broom Motor (d) None

Answer Sheet

Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.
34.01	**a**	**34.05**	**b**	**34.09**	**c**	**34.13**	**c**
34.02	**b**	**34.06**	**b**	**34.10**	**a**	**34.14**	**b**
34.03	**b**	**34.07**	**a**	**34.11**	**b**		
34.04	**d**	**34.08**	**c**	**34.12**	**a**		

Hydraulic & Pneumatics
Session: 35-40

35.01 When some hydraulic lines are tapped from main pressure line in parallel, they are called parallel circuit as well as circuit-
(a) Constant pressure (b) Series (c) Open loop (d) None

35.02 Pump's volume is distributed for Tamping Unit UP/DN, satellite drive, lifting-lining of track on 09-CSM & 09-3X. They are provided in circuit -
(a) Series (b) Parallel (c) Either 'a' & 'b' (d) None

35.03 Satellite lateral sliding, rail clamp, axle support/wheel support circuits in 09-CSM & 09-3X, is also part of ……..circuit-
(a) Constant pressure (b) Closed loop (c) Series (d) None

36.04 On 08-DUO the circuits such as tamping unit UP/DN lifting lining, work drive, rail clamp, tamping unit lateral displacement, axle/wheel support are called……circuit.-
(a) Constant pressure (b) Parallel (c) Both 'a' & 'b' (d) None

36.05 On Unimat,…….circuit consisting of Tamping Unit UP/DN, lifting-lining, work drive, rail clamp, Tamping Unit lateral displacement, Hook lifting-lowering-
(a) Series (b) Parallel (c) Constant Pressure (d) Both 'a' & 'b'

36.06 The screen drive, chain guide UP/DN circuit is a part of……..circuit.-
(a) Closed loop (b) Constant Pressure (c) Either 'a' & 'b' (d) None

37.07 In…….circuit, exhaust oil from the motor is returned directly to the pump inlet-
(a) Open loop (b) Closed loop (c) Either 'a' & 'b' (d) None

37.08 In……..circuit, the pump drains its supply from the tank. Its output is directed to a actuator & discharged from the actuator back into the tank-
(a) Open loop (b) Closed loop (c) Either 'a' & 'b' (d) None

37.09 On 09-CSM & 09-3X, the work drive circuit is an-example of…..circuit.-
(a) Open loop (b) Closed loop (c) Either 'a' & 'b' (d) None

37.10 Variable displacement pump and…….displacement motor is used in workdrive circuit of 09-CSM & 09-3X.-
(a) Variable (b) Fixed (c) Either 'a' & 'b' (d) None

37.11 On 09-CSM & 09-3X the variable pump delivery is controlled…….in work drive circuit-
(a) Electronically (b) Manually (c) By pilot pressure (d) None

37.12 Cross relief valve is used in……circuit.-
(a) Squeezing (b) Work drive (c) Lining (d) None

38.13 The driving circuit in BCM, SBCM & BRM is …….circuit-
(a) Open loop (b) Closed loop (c) Either 'a' & 'b' (d) None

38.14 On new BCM & SBCM, the variable pump (driving pump) volume is controlled by-
(a) Manual power (b) Pilot pressure (c) Electronic power (d) None

38.15 On Kershaw BRM, the flow of variable pump (driving pump) is controlled by…….
(a) Manual power (b) Pilot pressure (c) Electronic power (d) None

38.16 Maximum torque valve is switched-on in Kershaw BRM in driving circuit to …..torque during working drive.
(a) Increase (b) Decrease (c) Either 'a' & 'b' (d) None

39.17 In ……..circuit oil from the cylinder rod end of the cylinder is directed into the cap. End to increase speed-.
(a) Open loop (b) Closed loop (c) Regenerative (d) None

39.18 Squeezing circuit in tamping machine is ……circuit-.
(a) Regenerating (b) Open loop (c) Closed loop (d) None

Q.1 Which hydraulic circuits are used in 09-CSM & 09-3X ?

Q.2 What is closed loop circuit?

Q.3 What is regenerating circuit & where is it used in tampers?

Q.4 Define open loop circuit?

Q.5 Define series & parallel circuit?

Q.6 What is maximum torque valve in BRM?

Q.7 What does flushing valve do used in driving circuit of BCM ?

Answer Sheet

Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.
35.01	**a**	**36.05**	**d**	**37.09**	**b**	**38.13**	**b**	**39.17**	**c**
35.02	**b**	**36.06**	**b**	**37.10**	**b**	**38.14**	**c**	**39.18**	**a**
35.03	**a**	**37.07**	**b**	**37.11**	**a**	**38.15**	**a**		
36.04	**c**	**37.08**	**a**	**37.12**	**b**	**38.16**	**a**		

Track Machines & Working Principle
Session: 41 & 42 (T-28)

41.01 T-28 is deployed for the renewal of-
(a) Points & Crossing (b) Plain Track (c) Either 'a' or 'b' d) None

41.02 ……..can move on rail as well as on ground surface.
(a) PQRS (b) T-28 (c) TRT (d) None

41.03 T-28 has ……cross cylinders for lateral shifting.
(a) 1 (b) 2 (c) 3 (d) None

41.04 T-28 has …….vertical cylinders for lifting of complete bridge as well as crawlers.
(a) 1 (b) 2 (c) 3 (d) 4

41.05 T-28 has …… wheels/wheel cylinders.-
(a) 1 (b) 2 (c) 3 (d) 4

41.06 …… Wheels are run by hydraulic motor in T-28-
(a) 2 (b) 3 (c) 4 (d) None

41.07 The maximum speed of T-28 on rail is……kmph-.
(a) 10 (b) 40 (c) 60 (d) 80

41.08 The lifting capacity of each portal crane (T-28) is…….-
(a) 05T (b) 15T (c) 30T (d) None

41.09 Crawlers are run by……..in T-28 -.
(a) Mechanical power (b) Electrical Motor (c) Hydraulic Motor (d) None

41.10 The no. of crawlers provided in T-28-
(a) 1 (b) 2 (c) 3 (d) None

41.11 The maximum speed of T-28 on crawler is …….-
(a) 0.8 KMPH (b) 3 KMPH (c) 10 KMPH (d) None

41.12 ……..drive is provided in T-28-
(a) Hydraulic (b) Mechanical (c) Cannot be drivers (d) None

41.13 The models no. of 6 cylinder 172H.P. air cooled engine in T-28 is…….-
(a) SUN 6105 I (b) NTA 855L (c) HA 694 (d) None

41.14 The wheel dia of T-28 portal crane is-.
(a) 200mm (b) 400mm (c) 700mm (d) None

41.15 The pumps provided for driving of rail wheels & crawlers in T-28 are……..-.
(a) Fixed displacement (b) Variable displacement (c) Both 'a' & 'b' (d) None

41.16 The pumps provided for other than driving such as crawlers lifting-lowering, rail wheel lifting-lowering, crawler lateral shifting etc. in T-28 are……..-.
(a) Fixed displacement (b) Variable displacement (c) Both 'a' & 'b' (d) None

41.17 ……..is provided to unload the sleepers from wagons and to keep the sleepers at proper space for assembly of turnout.

(a) T-28 (b) Trolley (c) Jib Crane (d) None

41.18 The assembled turn out loaded on……for transportation-.
(a) Trolley (b) Jib Crane (c) T-28 portal crane (d) None

41.19 The wooden sleepers of length……..cm. are provided for facilitating passage of crawler on ground surface-.
(a) 10 (b) 30 (c) 60 (d) None

41.20 4 Nos. of rail pieces each……..cm. long is provided for lowering of rail wheels-.
(a) 10 (b) 20 (c) 40 (d) 70

41.21 The lateral shift of trolley table is-.
(a) ±100mm (b) ± 200mm (c) ± 400mm (d) ± 500mm

41.22 The trolley table can be lifted upto-.
(a) 200mm (b) 300mm (c) ± 300mm (d) None

41.23 The angular rotation of trolley table is-.
(a) $\pm 5^0$ (b) $\pm 10^0$ (c) $\pm 15^0$ (d) $\pm 20^0$

41.24 The capacity of non-motorized trolley is …….tonnes-.
(a) 15 (b) 20 (c) 25 (d) 35

41.25 The capacity of motorized trolley is …….tonnes-.
(a) 15 (b) 20 (c) 25 (d) 35

41.26 The engine provided on motorized trolley of T-28 is-.
(a) HA 694 diesel engine (b) NT 743 Cummins engine
(c) Lombardini petrol engine (d) None

41.27 The engine (93 Kw) provided on jib crane of T-28 is-.
(a) HA 694 (b) Diesel Engine DIN 6271 (c) NT 743 (d) None

41.28 The trolley table is laterally shifted and lifted by-.
(a) Hydraulic Power (b) Pneumatic power (c) Mechanical Power (d) None

41.29 The capacity of hydraulic tank on T-28 petrol crane is-.
(a) 400 Liter (b) 1000 Liter (c) 1700 Liter (d) None

41.30 The capacity of diesel tank on T-28 is-.
(a) 70 Liter (b) 120 Liter (c) 400 Liter (d) None

41.31 The rail wheel is……..for maintenance of rail wheel cylinder-.
(a) Removed (b) Overturned (c) Both ‘a’ & ‘b’ (d) None

41.32 When engine is ‘off’ the brakes are…….automatically-.
(a) Applied (b) Released (c) Either ‘a’ & ‘b’ (d) None

41.33 For replacement of wheel bearing, the motor pinion is …….with wheel pinion-.
(a) engaged (b) disengaged (c) either ‘a’ & ‘b’ (d) None

41.34 Extra lifting cylinder is provided to lift the-.
(a) turnout (b) crawler (c) rail wheel (d) None

Answer Sheet

Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.
41.01	a	41.10	b	41.19	c	41.28	a
41.02	b	41.11	b	41.20	d	41.29	a
41.03	b	41.12	a	41.21	c	41.30	b
41.04	b	41.13	a	41.22	b	41.31	b
41.05	d	41.14	b	41.23	b	41.32	a
41.06	a	41.15	b	41.24	c	41.33	b
41.07	a	41.16	a	41.25	d	41.34	a
41.08	c	41.17	c	41.26	c		
41.09	c	41.18	a	41.27	b		

Track Machines & Working Principle
Session: 42 (T-28)

42.01 There is……drive in T-28-
(a) Hydrostatic (b) Mechanical (c) Electromechanical d) None

42.02 The crawler drive motor and rail wheel drive motor are driven by ……..
(a) fixed displacement pump (b) variable displacement pump (c) either a or b
(d) None

42.03 Can crawler & rail wheel run altogether?
(a) Yes (b) No (c) Either 'a' & 'b' (d) None

42.04 Crawler & rail wheel move -
(a) Altogether (b) Alternately (c) Either 'a' & 'b' (d) None

42.05 During working drive, the speed of crawler with load is …….KMPH-
(a) 0.8 (b) 3 (c) 10 (d) None

Answer Sheet

Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.
42.01	**a**	**42.03**	**b**	**42.05**	**a**
42.02	**b**	**42.04**	**b**		

Track Machines & Working Principle
(B.R.M. Kershaw Make)
Session: 33

33.01 ……..makes ballast profile & transfers ballast from one end of the track to the other end & centre of the track-
(a) BRM (b) BCM (c) SBCM (d) UTV

33.02 ……collect the ballast towards sleeper end-
(a) Wings (b) Centre Plough (c) Broom (d) None

33.03 ……..Transfers ballast from one end to other end of track-
(a) Wings (b) Centre plough (c) Broom (d) None

33.04 ……..sweeps the excess ballast from fastenings & crib-
(a) Wings (b) Centre plough (c) Broom (d) None

33.05 ……..……can work in both directions-
(a) BCM (b) SBCM (c) BRM (d) None

33.06 The wings template makes angle of ……when the cylinder is fully extended & retracted.
(a) 30^0 (b) 45^0 (c) 60^0 (d) None

33.07 The broom is rotated by…… by……..pump in BRM.
(a) Hydraulic motor, 45GPM (b) Cylinder, 45GPM
(c) Hydraulic motor, 21 GPM (d) None

33.08 The RPM of broom is kept……in Kershaw BRM.
(a) 1000 (b) 2100 (c) 244 (d) None

33.09 The length of solid cylindrical rubber pieces of broom is-.
(a) 256mm (b) 356mm (c) 456mm (d) None

33.10 Centre plough templates are operated independently by-
(a) Motor (b) Cylinder (c) both 'a' & 'b' (d) None

33.11 The engine provided on Kershaw BRM is……-
(a) KT1150 (b) NTA855L (c) NT743 (d) HA694

33.12 The rated HP @1800rpm is……
(a) 265 (b) 273 (c) 453 (d) None

33.13 The length of Kershaw BRM over buffers is……..mm.
(a) 13313 (b) 10389 (c) 31800 (d) None

33.14 Double vane pump's flow rate is……..GPM pump in Kershaw BRM.-
(a) 45 & 21 (b) 38 & 17 (c) 20 & 14 (d) None

33.15 Broom drive pressure is set at……bar-
(a) 379 (b) 138 (c) 172 (d) None

33.16 Wings & centre plough pressure is set at……bar-
(a) 379 (b) 138 (c) 172 (d) None

33.17 Driving pressure is set at ……..bar--
(a) 379 (b) 138 (c) 172 (d) None

33.18 The capacity of hydraulic tank in Kershaw BRM is……ltrs.
(a) 511 (b) 617 (c) 750 (d) None

33.19 The capacity of HSD oil tank in Kershaw BRM is…….ltrs..
(a) 511 (b) 617 (c) 1000 (d) 1200

33.20 The capacity of pump drive gear box is……..ltrs.
(a) 4.2 (b) 5.2 (c) 11.3 (d) None

33.21 The capacity of transmission gear box is……..ltrs.
(a) 4.2 (b) 11.3 (c) 19 (d) None

33.22 The capacity of engine sump is……..ltrs.
(a) 4.2 (b) 42 (c) 19 (d) None

33.23 2 Nos. batteries of 205A.H. connected in……
(a) Series (b) Parallel (c) both 'a' & 'b' (d) None

33.24 Alternator (01 No.) of……ampere is provided in Kershaw BRM.
(a) 10 (b) 30 (c) 50 (d) None

33.25 ……cylinder air compressor is provided in Kershaw BRM which capacity is 0.38m^3/min.
(a) Single (b) Double (c) Tripple (d) None

33.26 The wing can be adjusted for making slope from……-
(a) 1:1 to 2½:1 (b) 1:1 to 4:1 (c) 1:1 to 1½ :1 (d) None

33.27 The displacement of engine model No. NTA 743 provided in Kershaw BRM is …….cubic inch-
(a) 855 (b) 743 (c) 1150 (d) None

33.28 …….. has a volume of 01 cubic metre.
(a) Broom (b) Centre Plough (c) Each Wing (d) None

33.29 …….engine's bore dia is 130mm & stroke length is 152mm provided in Kershaw BRM -
(a) NT 743 (b) NTA855L (c) KT1150 (d) None

33.30 The total……..of Kershaw BRM is 3617mm.
(a) Length (b) Width (c) Height (d) None

33.31 The total……..of Kershaw BRM machine is 3200mm-
(a) Length (b) Width (c) Height (d) None

33.32 The total……..of Plasser BRM is 11020mm-
(a) Length (b) Width (c) Height (d) None

33.33 The total……..of Plasser BRM with AC is 3530mm & without AC is 3220mm.-
(a) Length (b) Width (c) Height (d) None

33.34 The ……..of Plasser BRM with AC is 3185mm.-
(a) Length (b) Width (c) Height (d) None

33.35 The wheel dia of Plasser BRM is ……mm.-
(a) 838 (b) 730 (c) 1230 (d) None

33.36 The engine model No. of Plasser BRM is …….-
(a) NT743 (b) NTA855 (c) KT1150 (d) 6CTA 8.3.L

33.37 …….. engine's bore dia is 114mm and length of stroke is 135mm.-
(a) 6CTA8.3-L (b) NT743 (c) NTA855 (d) None

33.38 The displacement of engine model No. ..…is 8.27 ltr i.e. 504.7 cubic inch. `-
(a) NT743 (b) NTA855 (c) KT1150L (d) 6CTA8.3-L

33.39 The H.P of Engine Model No. ….is 194KW @ 2200rpm.-
(a) 6CTA8.3-L (b) MWMTBD232 (c) Deutz Engine (d) NT743

33.40 The cooling system of engine 6CTA8.3L is…...-
(a) Air cooled (b) Water cooled (c) both 'a' & 'b' (d) None

33.41 The pumps provided on Plasser BRM are.-
(a) Tipple pump 20, 14 & 10GPM (b) Variable displacement pump 125c.c/rev.
(c) Double pump 45 & 21GPM (d) Both 'a' & 'b'

33.42 Variable displacement pump is provided in Plasser BRM to operate-
(a) Driving Motor (b) Cooler fan motor (c) Brush unit motor (d) Shoulder plough

33.43 10 GPM pump in Plasser BRM is provided to operate-
(a) Shoulder Plough UP/DN (b) Front plough UP/DN
(c) Brush unit UP/DN (d) All of the above

33.44 ……GPM pump is provided to run rotary brush unit motor-
(a) 20 GPM (b) 14 GPM (c) 10 GPM (d) 125cc/rev.

33.45 The rpm of…….motor is 300 in Plasser BRM-
(a) Cooler fan (b) Cross conveyor belt (c) Brush unit (d) None

33.46 The capacity of both…tanks is 450 ltr. In Plasser BRM-
(a) Fuel (b) Hydraulic oil (c) Engine Sump (d) Both 'a' & 'b'

33.47 The capacity of…… is 4.0 ltr in Plasser BRM-
(a) Pump drive gear box (b) Engine sump (c) Engine radiator (d) Axle gear box

33.48 The capacity of…… is 25 ltr in Plasser BRM-
(a) Engine radiator (b) Engine sump (c) Both 'a' & 'b' (d) Axle gear box

33.49 The capacity of…… is 5.5 ltr in Plasser BRM-
(a) Engine sump (b) Engine radiator (c) Each axle gear box d) None

33.50 The alternator rating is……amp. in Plasser BRM-
(a) 30 (b) 55 (c) 75 (d) None

33.51 The batteries rating provided in Plasser BRM is……connected in series-
(a) 120AH (b) 180AH (c) 205AH (d) None

Answer Sheet

Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.
33.01	**a**	**33.16**	**c**	**33.31**	**b**	**33.46**	**d**
33.02	**a**	**33.17**	**a**	**33.32**	**a**	**33.47**	**a**
33.03	**b**	**33.18**	**a**	**33.33**	**c**	**33.48**	**b**
33.04	**c**	**33.19**	**b**	**33.34**	**b**	**33.49**	**c**
33.05	**c**	**33.20**	**a**	**33.35**	**b**	**33.50**	**b**
33.06	**b**	**33.21**	**b**	**33.36**	**d**	**33.51**	**b**
33.07	**a**	**33.22**	**b**	**33.37**	**a**		
33.08	**c**	**33.23**	**a**	**33.38**	**d**		
33.09	**b**	**33.24**	**b**	**33.39**	**a**		
33.10	**b**	**33.25**	**a**	**33.40**	**b**		
33.11	**c**	**33.26**	**a**	**33.41**	**d**		
33.12	**a**	**33.27**	**b**	**33.42**	**a**		
33.13	b	**33.28**	**c**	**33.43**	**d**		
33.14	**a**	**33.29**	**a**	**33.44**	**a**		
33.15	**b**	**33.30**	**c**	**33.45**	**c**		

Track Machines & Working Principle
(B.R.M.)
Session: 34

34.01 AA4V is the model no. of ……in Kershaw BRM-
(a) variable pump (b) Hydrostatic Motor (c) Fixed displacement pump (d) None

34.02 AA6VM is the model no. of ……in Kershaw BRM-
(a)variable pump (b) Hydrostatic Motor (c) Broom Motor (d) None

34.03 ……..drive is used in Kershaw BRM.-
(a) Mechanical (b) Hydrostatic (c) Electromech (d) None

34.04 The……...is mounted on pump drive gear box in Kershaw BRM-
(a) Variable displacement pump (b) Variable displacement propelling motor
(c) Fixed displacement pump (d) Both 'a' & 'c'

34.05 The…….…….is mounted on two speed transmission gear box in Kershaw BRM-
(a) Variable displacement pump (b) Variable displacement propelling motor
(c) Broom motor (d) Fixed displacement pump.

34.06 The hydrostatic propelling system is a ……loop system in Kershaw BRM.
(a) Open (b) Closed (c) both 'a' & 'b' (d) None

34.07 ….. which is mounted on the rear of the variable displacement pump, supplies oil to the hydrostatic loop.-.
(a) Charge pump (b) Vane pump (c) Variable displacement pump (d) None

34.08 In hydrostatic propelling system, the oil leakage from the hydrostatic loop is carried by the case drains of the hydrostatic pump & motor back to the…….-
(a) Pump (b) Motor (c) Reservoir (d) None

34.09 Pressure above the motor threshold pressure cause the motor to shift towards full displacement which will give the machine……tractive effort-
(a) Min (b) Max. (c) both 'a' & 'b' (d) None

34.10 ……can be held at max. displacement by switching on the Max. Torque control valve in Kershaw BRM.
(a) Hydrostatic motor (b) Variable displacement pump (c) Broom Motor (d) None

34.11 Hydraulic power from……is required to operate the transmission disconnect cylinder during towing of Kershaw BRM.-
(a) Emergency pump (b) Hydrostatic transmission charge pump
(c) Either 'a' & 'b' (d) None

34.12 …….is provided one on each axle in Plasser BRM-.
(a) Variable pump (b) Driving Motor (c) Broom Motor (d) None

Answer Sheet

Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.
34.01	a	34.05	b	34.09	b
34.02	b	34.06	b	34.10	a
34.03	b	34.07	a	34.11	c
34.04	d	34.08	c	34.12	b

Track Machines & Working Principle
Session: 41 & 42 (T-28)

41.01 T-28 is designed generally for the renewal of-
(a) Points & Crossing (b) Plain Track (c) both 'a' or 'b' d) None

41.02 ……..can move on rail as well as on ground surface.
(a) PQRS (b) T-28 (c) TRT (d) None

41.03 T-28 has ……cross cylinders for lateral shifting.
(a) 1 (b) 2 (c) 3 (d) None

41.04 T-28 has …vertical cylinders for lifting-lowering of complete bridge as well as crawlers.
(a) 1 (b) 2 (c) 3 (d) 4

41.05 T-28 has …… wheels/wheel cylinders.-
(a) 1 (b) 2 (c) 3 (d) 4

41.06 …… Wheels are run by hydraulic motor in T-28-
(a) 2 (b) 3 (c) 4 (d) None

41.07 The maximum speed of T-28 on rail is……kmph-.
(a) 10 (b) 40 (c) 60 (d) 80

41.08 The lifting capacity of each portal crane (T-28) is…….-
(a) 25T (b) 35T (c) 30T (d) None

41.09 Crawlers are run by……..in T-28 -.
(a) Mechanical power (b) Electrical Motor (c) Hydraulic Motor (d) None

41.10 The no. of crawlers provided in T-28-
(a) 1 (b) 2 (c) 3 (d) 4

41.11 The maximum speed of T-28 on crawler is …….-
(a) 0.8 KMPH (b) 3 KMPH (c) 10 KMPH (d) None

41.12 ……..drive is provided in T-28-
(a) Hydraulic (b) Mechanical (c) Both 'a' & 'b' (d) None

41.13 The models no. of 6 cylinder 172H.P. air cooled engine in T-28 is…….-
(a) SUN 6105 I (b) NTA 855L (c) HA 694 (d) None

41.14 The wheel dia of T-28 portal crane is-.
(a) 200mm (b) 400mm (c) 700mm (d) None

41.15 The pumps provided for driving of rail wheels & crawlers in T-28 are……..-.
(a) Fixed displacement (b) Variable displacement (c) Both 'a' & 'b' (d) None

41.16 The pumps provided for other than driving such as crawlers lifting-lowering, rail wheel lifting-lowering, crawler lateral shifting etc. in T-28 are……..-.
(a) Fixed displacement (b) Variable displacement (c) Both 'a' & 'b' (d) None

41.17 ……..is provided to unload the sleepers from wagons and to keep the sleepers at proper space for assembly of turnout.
(a) T-28 (b) Trolley (c) Jib Crane (d) None

41.18 The assembled turn out loaded on…….for transportation-.
(a) Trolley (b) Jib Crane (c) T-28 portal crane (d) None

41.19 The wooden sleepers of length……..cm. are provided for facilitating passage of crawler on ground surface-.
(a) 10 (b) 30 (c) 60 (d) None

41.20 4 Nos. of rail pieces each……..cm. long is provided for lowering of rail wheels-.
(a) 10 (b) 20 (c) 40 (d) 70

41.21 The lateral shift of trolley table is-.
(a) ±100mm (b) ± 200mm (c) ± 300mm (d) ± 500mm

41.22 The trolley table can be lifted upto-.
(a) 200mm (b) 300mm (c) 500mm (d) None

41.23 The angular rotation of trolley table is-.
(a) $\pm 5^0$ (b) $\pm 10^0$ (c) $\pm 15^0$ (d) $\pm 20^0$

41.24 The capacity of non-motorized trolley is …….tonnes-.
(a) 15 (b) 20 (c) 25 (d) 35

41.25 The capacity of motorized trolley is …….tonnes-.
(a) 15 (b) 20 (c) 25 (d) 35

41.26 The engine provided on motorized trolley of T-28 is-.
(a) HA 694 diesel engine (b) NT 743 Cummins engine
(c) Lombardini petrol engine (d) None

41.27 The engine (93 Kw) provided on jib crane of T-28 is-.
(a) HA 694 (b) DIN 6271 (c) NT 743 (d) None

41.28 The trolley table is laterally shifted and lifted by-.
(a) Hydraulic Power (b) Pneumatic power (c) Mechanical Power (d) None

41.29 The capacity of hydraulic tank on T-28 petrol crane is-.
(a) 400 Liter (b) 1000 Liter (c) 1700 Liter (d) None

41.30 The capacity of diesel tank on T-28 is-.
(a) 70 Liter (b) 120 Liter (c) 400 Liter (d) None

41.31 The rail wheel is……..for maintenance of rail wheel cylinder-.
(a) Removed (b) Overturned (c) Both 'a' & 'b' (d) None

41.32 When engine is 'off' the brakes are…….automatically-.
(a) Applied (b) Released (c) both 'a' & 'b' (d) None

41.33 For replacement of wheel bearing, the motor pinion is …….with wheel pinion-.
(a) Engaged (b) disengaged (c) both 'a' & 'b' (d) None

41.34 Extra lifting cylinder is provided to lift the-.
(a) Turnout (b) crawler (c) rail wheel (d) None

Answer Sheet

Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.	Q. No.	Ans.
41.01	**a**	**41.10**	**b**	**41.19**	**c**	**41.28**	**a**
41.02	**b**	**41.11**	**b**	**41.20**	**d**	**41.29**	**a**
41.03	**b**	**41.12**	**a**	**41.21**	**c**	**41.30**	**b**
41.04	**b**	**41.13**	**a**	**41.22**	**b**	**41.31**	**b**
41.05	**d**	**41.14**	**b**	**41.23**	**b**	**41.32**	**a**
41.06	**a**	**41.15**	**b**	**41.24**	**c**	**41.33**	**b**
41.07	**a**	**41.16**	**a**	**41.25**	**d**	**41.34**	**a**
41.08	**c**	**41.17**	**c**	**41.26**	**c**		
41.09	**c**	**41.18**	**a**	**41.27**	**b**		

Track Machines & Working Principle
Session: 42 (T-28)

42.01 The crawler drive motor and rail wheel drive motor are driven by ……..
(a) fixed displacement pump (b) variable displacement pump (c) both 'a' & 'b' (d) None

42.02 Can crawler & rail wheel run altogether?
(a) Yes (b) No (c) both 'a' & 'b' (d) None

42.03 Crawler & rail wheel move -
(a) Altogether (b) Alternately (c) both 'a' & 'b' (d) None

Answer Sheet

Q. No.	Ans.	Q. No.	Ans.
42.01	**b**	**42.03**	**b**
42.02	**b**		