

Q=QUESTION A=ANSWER	question_description answer_description	question_explanation answer_explanation	question_type answer_isright	question_difficulty answer_position
Q	Optimum design is the process of selecting the best possible design satisfying certain criteria like		M	1
A	Feasible design.		1	1
A	Geometrical tolerance.		0	2
A	Dimensional tolerance.		0	3
A	concurrent engineering.		0	4
Q	Johnsons Method is the method of		M	1
A	Product Design		0	1
A	Component Design		0	2
A	Optimum design		1	3
A	System design		0	4
Q	Morphology of design refers to the _____ based sequencing of design operations.		M	1
A	condition		0	1
A	limit		0	2
A	time		1	3
A	cost		0	4
Q	Design methodology which deals with preparing specification list is to identify		M	1
A	Manufacturing sequence.		0	1
A	Output capacity of product.		1	2
A	Geometrical tolerance.		0	3
A	Dimensional tolerance.		0	4
Q	Formation of mathematical model is a part of		M	1
A	Feasibility Study		0	1
A	Preliminary design		1	2
A	Detailed Design		0	3

A	Planning for Manufacturing		0	4
Q	Which is not associated with optimum Design	M		1
A	There is unique optimum design for given optimum design problem		0	1
A	Optimum Design results in saving or improvement in performance or both		0	2
A	Design does not carried out on the basis of most significant quantity to be optimised.		1	3
A	Design is carried out on the basis of most significant quantity to be optimised.		0	4
Q	Subsidiary Design Equation stands for	M		1
A	Cost, weight.		0	1
A	Stress equation.		1	2
A	Limit Equation.		0	3
A	Shape, dimension.		0	4
Q	One of the category of optimum design consist of	M		1
A	financial capabilities.		0	2
A	warehouse system.		0	3
A	Redundant Specification.		1	4
A	Testing design.		0	1
Q	Which of the following is not a hoisting equipment ?	M		1
A	Pulleys		0	1
A	Cage elevators		0	2
A	Jib cranes		0	3
A	Troughed belts		1	4
Q	How steel wire ropes are specified?	M		1
A	Nominal rope diameter in mm followed by the number of strands and number of wires in each strand		1	1

A	Weight of wire per meter length		0	2
A	Breaking load in kN followed by rope diameter		0	3
A	Breaking load in kgf followed by rope diameter		0	4
Q	The higher rope life is achieved by using	M		1
A	3- bend system		1	1
A	4- bend system		0	2
A	5- bend system		0	3
A	6- bend system		0	4
	Which of the following material handling equipment can be used to raise and shift heavy loads from one place to another?			
Q		M		1
A	Elevator		0	1
A	Crane		1	2
A	Conveyor		0	3
A	Truck		0	4
Q	The capacity of the crane is expressed in terms of :	M		1
A	Type of drive		0	1
A	Tonnes		1	2
A	Span		0	3
A	Lift		0	4
	Which of the following stress is not induced in a rope drum of hoisting mechanism?	M		1
Q				
A	Bending stress		0	1
A	Crushing stress		0	2
A	Shear stress		0	3
A	Direct tensile stress		1	4
	In which following type of steel wire rope construction, the wires of same diameters are used?	M		1
Q				

A	Ordinary construction		1	1
A	Warrington compound construction		0	2
A	Compound construction		0	3
A	Warrington compound and Compound construction		0	4
	Calculate the speed of the pulley having diameter 667mm used in hoisting mechanism. Hoisting speed is 10 m/min.			
Q		M		1
A	9.5 rpm		0	1
A	9.52 rpm		0	2
A	9.54 rpm		1	3
A	9.56 rpm		0	4
Q	Bend is considered as point where:	M		1
A	Rope moves over the pulley or leaves the pulley		1	1
A	Rope moves over the drum or leaves the drum		0	2
A	Rope moves over the drum or leaves the pulley		0	3
A	Rope moves over the axle and leaves the pulley		0	4
Q	Shackle plate is subjected to	M		1
A	Tension, Double shear and Crushing Failure		1	1
A	Bending, Double shear and Crushing Failure		0	2
A	Compression, Double shear and Fatigue		0	3
A	Fatigue, bending		0	4
Q	Wire rope usually fails because of	M		1
A	Bending		0	1
A	Compression		0	2
A	Shear		0	3

A	Fatigue		1	4
Q	As number of bends increases, which of the following ratio increases?	M		1
A	Diameter of rope to Diameter of pulley		0	1
A	Diameter of pulley to Diameter of rope		1	2
A	Diameter of drum to Diameter of pulley		0	3
A	Diameter of pulley to Diameter of axel		0	4
Q	Choice of rope to provide maximum resistance to wear and vibration are	M		1
A	6*37		0	1
A	6*7		1	2
A	6*19		0	3
A	6*12		0	4
Q	While load being lifted, the wire rope makes contact with sheave at _____ of groove.	M		1
A	bottom		1	1
A	top		0	2
A	sides		0	3
A	sides and top		0	4
Q	For 6 X 19 steel wire rope, determine the diameter of wire if the diameter of rope is 24 mm.	M		1
A	1.2 mm		0	1
A	1.3 mm		0	2
A	1.4 mm		0	3
A	1.5 mm		1	4
Q	When the hook is loaded, the inner fiber of the hook is subjected to _____.	M		1

A	Compressive stress and bending stress		0	1
A	Tensile stress and bending stress.		1	2
A	Shear stress		0	3
A	Bending stress only		0	4
Q	Height of cross-piece in snatch block is calculated by considering following induced stress in it.	M		1
A	Direct tensile stress		0	1
A	Bending stress		1	2
A	Shear stress		0	3
A	Compressive stress		0	4
Q	Determine the induced shear stress in a M 70 X 5 nut for hook if the design load is 12 t.	M		1
A	7.2 MPa		0	1
A	7.4 MPa		0	2
A	7.6 MPa		0	3
A	7.8 MPa		1	4
Q	In EOT crane, bearing selection for hook depends on _____.	M		1
A	static load carrying capacity and shank diameter of hook		1	1
A	dynamic load carrying capacity and shank diameter of hook		0	2
A	static load carrying capacity and radius of curvature of hook		0	3
A	Radius of curvature of hook and shank diameter of hook		0	4
Q	Speed of conveyor system depends on	M		1
A	Motor attached to the system		0	1
A	angle of inclination		0	2
A	angle of surge.		0	3

A	Nature of the material to be conveyed.		1	4
Q	The following is used to transport materials having flat bottoms	M		1
A	Flat belt conveyor		0	1
A	v-belt conveyor		0	2
A	screw conveyor		0	3
A	Roller conveyor		1	4
Q	Which type of conveyor is used for the long-distance transportation:	M		1
A	Flat belt conveyor		1	1
A	Chain conveyor		0	2
A	Screw conveyor		0	3
A	V-Belt conveyor		0	4
Q	What do you mean by bulk materials?	M		1
A	Materials in the form of granules.		1	1
A	Lump of materials.		0	2
A	Homogeneous partials.		0	3
A	Heterogeneous particles.		0	4
Q	Which flat belt drive system has two pulleys mounted on driven shaft and one pulley on driving shaft?	M		1
A	Multiple belt drive		0	1
A	Cone pulley drive		0	2
A	Fast and loose pulley drive		1	3
A	V belt drive		0	4
Q	For same pulley diameters, center distance, belt speed and belt and pulley materials,	M		1
A	Open belt drive transmits more power than crossed belt drive		0	1
A	Crossed belt drive transmits more power than open belt drive		1	2

A Open and crossed belt drives transmit same power

A Power transmission does not depend upon open and crossed types of constructions

Q The maximum inclination in troughed belt conveyor is:

A 25 degree

A 30 degree

A 35 degree

A 40 degree

Q A Flat belt is required to transmit 30kW for 600rpm to a machine pulley 1200mm diameter. Distance between the pulley centres is 3000mm and speed ratio 3:1. Calculate the speed of Belt in mm/s
note: $(I = D/d = n/N), (V = \pi \cdot D \cdot N / 60)$

A 37699.11

A 39642.28

A 40861.11

A 50124.67

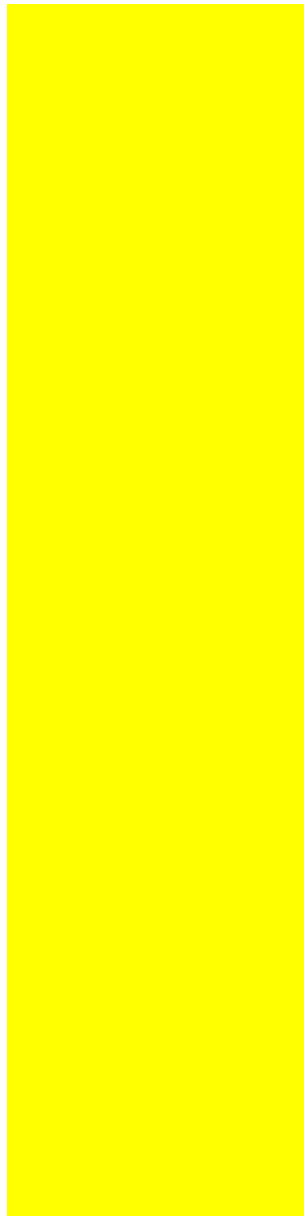
Q An inclined belt conveyor is used for loading goods. If speed of the belt having 1500 mm width(B), is $(v)3$ m/s then what is the volumetric capacity of the conveyor?
Note:(For 21deg, $k = 2.35 \times 10^{-4}$)
 $Q = k \cdot b^2 \cdot v, b = 0.9B - 0.5$

A $1.19 \times 10^{-3} \text{ m}^3 / \text{s}$

A $1.75 \times 10^{-3} \text{ m}^3 / \text{s}$

A $1.5 \times 10^{-3} \text{ m}^3 / \text{s}$

A $2.5 \times 10^{-3} \text{ m}^3 / \text{s}$



0 3

0 4

M 1

0 1

0 2

1 3

0 4

M 1

1 1

0 2

0 3

0 4

M 1

1 1

0 2

0 3

0 4

Q The following is supported from the ceilings

A flat Belt conveyor

A Roller conveyor

A Chain conveyor

A v-belt conveyor

Mass capacity of a conveyor is (M) 200 ton/hr, if speed of the belt is (v) 4 m/s then what is the (B) width of horizontal flat belt conveyor carrying the load? (Surcharge factor = 0.075 & $\rho = 1000 \text{ kg/m}^3$ Note : $(Q= c.b^2.v, M= \rho.Q, b= 0.9B-0.5)$)

Q

A 499.23 mm

A 500.0 mm

A 397.0 mm

A Insufficient data

The objective of 'crowning' of the flat pulleys of belt drive is to

Q

A Prevent the belt from running off the pulley

A Increase the power transmission capacity

A Increase the belt velocity

A Prevent the belt joint from damaging the belt surface

_____ are subject to wear, due to their own inherent load and due to the gas load acting on them

Q

A piston pin

A piston ring

A crank pin

A connecting rod

M

	1
0	1
0	2
1	3
0	4

M

	1
0	1
0	2
1	3
0	4

M

	1
1	1
0	2
0	3
0	4

M

	1
0	1
1	2
0	3
0	4

Q For piston pin failure identify the odd one out from below options
 A bending failure
 A tensile failure
 A shear failure
 A bearing failure

Q If maximum combustion force is 44210 N, length of piston pin in connecting rod is 46 mm, then induced bearing stress in piston pin is _____

A 41.78 N/mm²
 A 33.44 N/mm²
 A 23.42 N/mm²
 A 13.54 N/mm²

Q In most of internal combustion engines, crankshaft bearings is
 A hydrostatic journal bearing
 A hydrodynamic journal bearing
 A ball bearings
 A roller bearings

Q The material used for cylinder liner in I.C. engine is
 A mild steel
 A cast iron
 A copper
 A brass

Q When the length of connecting rod is small, it results in
 A more chances of buckling failure
 A lesser angular swing and lesser side thrust on piston
 A greater angular swing and greater side thrust on piston

M 1
 0 1
 1 2
 0 3
 0 4

M 1
 0 1
 0 2
 1 3
 0 4

M 1
 0 1
 1 2
 0 3
 0 4

M 1
 0 1
 1 2
 0 3
 0 4

M 1
 0 1
 0 2
 1 3

A	no side thrust on piston		0	4
Q	The _____ withstands the gas pressure inside the cylinder	M		1
A	piston crown		1	1
A	piston barrel		0	2
A	piston boss		0	3
A	piston pin		0	4
Q	Engine piston is usually made up of aluminium alloy because	M		1
A	wear is less		0	1
A	its stronger		0	2
A	its lighter		1	3
A	it absorbs shocks		0	4
Q	A petrol engine has a compression ratio from	M		1
A	6 to 10		1	1
A	15 to 20		0	2
A	26 to 30		0	3
A	36 to 40		0	4
Q	The indicated thermal efficiency of diesel engine is about	M		1
A	0.1		0	1
A	0.2		0	2
A	0.3		0	3
A	0.4		1	4
Q	For the same compression ratio, _____	M		1
A	Otto cycle is more efficient than the diesel cycle		1	1
A	Diesel cycle is more efficient than otto cycle		0	2
A	Both otto and diesel cycle are equally efficient		0	3

A Compression ratio has nothing to do with efficiency

Q In most of internal combustion engines, crankshaft bearings is

A hydrostatic journal bearing

A hydrodynamic journal bearing

A ball bearings

A roller bearings

Q Piston rings are not completely closed because

A Closed rings are difficult to manufacture

A Gap allows the ring to expand and fit over

A They are designed to let pass some lubricant to combustion chamber

A Closed ring doesn't dissipate heat properly

Q The _____ acts as a bearing surface for the side thrust in a I.C. engine

A piston pin

A piston head

A piston skirt

A piston boss

Q For a diesel cycle in an I.C. engine find the maximum pressure if the suction pressure is 1 bar, compression ratio is 15.5 and adiabatic index is 1.3

A 3.527 N/mm²

A 15.27 N/mm²

A 25.27 N/mm²

A 35.27 N/mm²

0 4

M 1

0 1

1 2

0 3

0 4

M 1

0 1

1 2

0 3

0 4

M 1

0 1

0 2

1 3

0 4

M 1

1 1

0 2

0 3

0 4

Q Find maximum gas force acting on stud of a cylinder head, if cylinder bore is 120 mm, maximum gas pressure is 5 MPa and number of studs used is 6

- A 21.2 KN
- A 16.8 KN
- A 9.4 KN
- A 3.5 KN

Q In an I.C. engine, find the total force acting on stud if core area of stud is 105 mm² and design stress of stud material is 128 Mpa

- A 7.28 KN
- A 13.44 KN
- A 22.54 KN
- A 30.25 KN

Q In a connecting rod, the big end is usually made in _____ so as to mount it easily on the crankpin bearing shell

- A one part
- A two parts
- A three parts
- A four parts

Q In general practice, for safe design of connecting rod, the _____ created due to inertia force must be checked.

- A tensile stress
- A compressive stress
- A shear stress
- A bending stress

M		1
	0	1
	0	2
	1	3
	0	4
M		1
	0	1
	1	2
	0	3
	0	4
M		1
	0	1
	0	2
	0	3
	1	4

Q Find the diameter of stud of cylinder head, if the total force acting on stud is 15 KN and design stress of stud material is 110 Mpa

- A 51.5 mm
- A 39.8 mm
- A 27.2 mm
- A 13.1 mm

Q The Constraint on bearing outer diameter of the gear pump is

- A (pitch circle diameter) < (Outer diameter of bearing - 5)
- A (pitch circle diameter) < (inner diameter of bearing - 5)
- A (root diameter of bearing) < (pitch circle diameter - 5)
- A (Outer diameter of bearing) < (root diameter - 5)

Q Which of the following type of impeller is used in centrifugal pump dealing with muds?

- A One side shrouded
- A Two side shrouded
- A Double section
- A Open

M

0 1
0 2
0 3
1 4

M

0 1
0 2
0 3
1 4

M

0 1
0 2
0 3
1 4

Q What cause discharge of fluid in an external gear pump? 1. the electric motor drives one gear which turns the other gear. 2. the electric motor drives both the gears simultaneously. 3. fluid passes between the gears to discharge side. 4. fluid passes through interior of the casing between teeth and casing and not between the gears.

- A 1 and 3
- A 2 and 3
- A 1 and 4
- A 2 and 4

Q Which of the following is NOT a type of positive displacement pumps?

- A Reciprocating pump
- A Rotary displacement pump
- A Centrifugal pump
- A Rotary lobe pump

A centrifugal pump running at 500 rpm with maximum efficiency, is delivering a head of 30 m at flow rate of 60 litre per minutes. If the rpm is changed to 1000, then the head H in metres and flow rate Q in litres per minute at maximum efficiency are estimated to be

- A H=120, Q=120
- A H=60, Q=120
- A H= 60, Q=4800
- A H= 120, Q=30

Q What causes internal leakage in internal gear pump?

M

M

M

M

		1
0		1
0		2
1		3
0		4
		1
0		1
0		2
1		3
0		4
		1
1		1
0		2
0		3
0		4
		1

A less tolerance level between the meshing surfaces

A more tolerance level between the meshing surfaces

A zero tolerance between the surfaces.

A zero tolerance between the meshing surfaces.

Q Manometric head is :

A The head developed by the pump

A It is the height to which water is lift by the pump measured above the pump centerline

A It is the difference in elevation between the water surface in the high level reservoir and the water level in the pump

A It is the difference in the piezometric heads between the points on the delivery and suction pipes as close to the pump as possible.

Q The flow ratio for centrifugal pump is:

A 0.10 to 0.25

A 0.25 to 0.40

A 0.40 to 0.50

A 0.50 to 0.65

Q What is the relation between pressure and overall efficiency for a gear pump?

A as pressure increases, overall efficiency decreases

A as pressure increases, overall efficiency increases

A overall efficiency is not affected by change in pressure

M

M

M

0 1

1 2

0 3

0 4

0 1

0 1

0 2

0 3

1 4

1 1

0 2

0 3

0 4

1 1

0 2

0 3

A	as pressure increases, overall efficiency is constant		0	4
Q	To deliver water to a height of 100m, in how many stages centrifugal pump will be required & how they will be arranged?	M		1
A	Single Stage,series arrangement		0	1
A	Muti Stage,series arrangement		1	2
A	Single Stage,parallel arrangement		0	3
A	Multi stage, parellel arrangement		0	4
Q	Volumetric efficiency is the ratio of	M		1
A	theoretical flow rate to actual flow rate		0	1
A	actual flow rate to theoretical flow rate		1	2
A	actual fluid power to pump input power		0	3
A	actual fluid power to motor input power		0	4
Q	Head developed by medium lift centrifugal pump is:	M		1
A	Upto 15m		0	1
A	Upto 25m		0	2
A	Upto 40m		1	3
A	Above 40m		0	4
Q	In case of the gear pump, outer diameter of the casing is given by.....	M		1
A	(2*pitch circle diameter of the casing) + (5 * diameter of the bolt)		0	1
A	(pitch circle diameter of the casing) + (3 * diameter of the bolt)		1	2
A	(2*pitch circle diameter of the casing) + (3 * diameter of the bolt)		0	3

A	(pitch circle diameter of the casing) + (5 * diameter of the bolt)		0	4
Q	The mechanical clearances between the gear and the casing are in the order of	M		1
A	10000 μm.		0	1
A	1000 μm.		0	2
A	100 μm.		0	3
A	10 μm.		1	4
Q	The volute pumps and vortex volute pumps are _____ pumps with _____ shaft.	M		1
A	multistage, vertical		0	1
A	multistage, horizontal		0	2
A	single stage, horizontal		1	3
A	single stage, vertical		0	4
Q	The hydrostatic force (F_h) developed is only in x-direction. 'Pmax' is the maximum pressure that can be attained in a gear pump. 'R' be the external radius of the gear or internal radius of the casing. The 'b' is the width of the gear	M		1
A	$F_h = 1.6366 * P_{max} * 2b * R$		0	1
A	$F_h = 1.6366 * P_{max} * b * R$		1	2
A	$F_h = 2 * P_{max} * 4b * R$		0	3
A	$F_h = 2.5 * 6366 * P_{max} * 3b * R$		0	4
Q	The gear pump consist of a gear with a design bending stress (σ_b) as 400 N/mm ² , the width of the gear is 50 mm. The Lewis form factor is 0.3366. The module is 5mm. The static strength of the gear is	M		1

A	23.56kN		0	1
A	33.63kN		1	2
A	83.25 kN		0	3
A	93.45 kN		0	4
Q	The gear pump operates with a power of 5.5 kW. The pitch line velocity is 2.5 m/s. The Barth Velocity factor is 1.305. Calculate the dynamic load.	M		
A	800 N		0	1
A	1800 N		0	2
A	2800 N		1	3
A	4000 N		0	4
Q	_____ is a mechanical device used for transmitting power from prime mover to a machine with change in torque.	M		1
A	Actuator		0	1
A	Cam		0	2
A	Gearbox		1	3
A	Pump		0	4
Q	Deviation of actual spindle speeds from calculated spindle speeds must not exceed _____	M		1
A	10 (ϕ -1)		1	1
A	20 (ϕ -1)		0	2
A	30 (ϕ -1)		0	3
A	40 (ϕ -1)		0	4
Q	In geometric progression due to _____ spindle speed Diameter range is high.	M		1
A	Low		1	1
A	High		0	2
A	Constant		0	3

A	Insufficient data		0	4
Q	Range ratio for central lathe is _____	M		1
A	10 to 15		0	1
A	15 to 25		0	2
A	15 to 30		0	3
A	40 to 60		1	4
	Standard values of geometric progression ratio ϕ for series $\phi 20/3$ equal to _____			1
Q		M		
A	1.41		1	1
A	1.56		0	2
A	1.78		0	3
A	2		0	4
Q	Purpose Gearbox is _____	M		1
A	To increase torque		0	1
A	To increase speed		0	2
	Converts single input speed into multiple output speeds			3
A			0	
	To increase torque, speed and Converts single input speed into multiple output speeds			4
A			1	
	What is the maximum percentage loss of economic cutting speed if geometric progression ratio = 1.06 ?			1
Q		M		
A	17.00%		0	1
A	11.50%		0	2
A	5.70%		0	3
A	2.90%		1	4
	Which of the following statements is true for structure/speed diagrams?			1
Q		M		
A	Structure diagrams gives range ratio of spindle speeds		0	1
	Speed diagrams do not give range ratio of spindle speeds			2
A			0	

A	Speed diagrams consider motor speed		1	3
A	Speed Diagrams indicate the output speeds		0	4
	For the higher value of geometric progression ratio ϕ the number of speed steps or spindle speeds Z is_____			1
Q	is_____	M		
A	Low		1	1
A	High		0	2
A	Moderate		0	3
A	Insufficient data		0	4
	For machine tool gear box the transmission range should not be greater than_____			1
Q	should not be greater than_____	M		
A	9		0	1
A	10		0	2
A	11		0	3
A	8		1	4
	Recommend value of ϕ for heavy duty machine tools and automats_____			1
Q	and automats_____	M		
A	1.12		1	1
A	1.26		0	2
A	1.14		0	3
A	1.58		0	4
	For the higher the value of geometric progression ratio ϕ the loss of economic cutting speed is_____			1
Q	ratio ϕ the loss of economic cutting speed is_____	M		
A	Low		1	1
A	High		0	2
A	Moderate		0	3
A	Insufficient data		0	4

Q If Geometric progression ratio = 1.06 , minimum speed of 100 r.p.m. How many speed steps are required to achieve speed of 200 rpm?

- A 11
- A 12
- A 13
- A 14

Q In machine tool gear box, optimum number of speed steps with increments between---

- A 5 to 10 %
- A 10 to 15 %
- A 15 to 20 %
- A 20 to 25 %

Q Zth Spindle speed in Arithmetic progression ----

- A $n_z = (n_{max} - n_{min}) / (Z - 1)$
- A $n_z = (n_{max} / n_{min})^{(1/Z - 1)}$
- A $n_z = (1/n_{min}) - (1/n_{max})$
- A $n_z = (n_{max} - n_{min})$

Q If cutting velocity is 40 m/min, Maximum shaft diameter is 100 mm and minimum diameter of a shaft is 80 mm to be machined then What is the maximum spindle speed ?

- A 120 r.p.m
- A 127 r.p.m
- A 160 r.p.m.
- A 636 r.p.m.

Q Multispeed drive with harmonic progression is / are poor in-----spindle speed range.

- A High
- A Low

M

- 0 1
- 1 2
- 0 3
- 0 4

M

- 0 1
- 0 2
- 1 3
- 0 4

M

- 1 1
- 0 2
- 0 3
- 0 4

M

- 0 1
- 0 2
- 1 3
- 0 4

M

- 1 1
- 0 2

A	Moderate		0	3
A	Insufficient data		0	4
	The smaller value of geometric progression ratio ϕ is /			1
Q	are used in _____	M		
A	Large sized heavy duty machine		0	1
A	Automats		0	2
A	Both Large sized heavy duty machine & Automats		1	3
A	Small sized special purpose machine tools		0	4
	For a gear box, minimum & maximum speed is 28 rpm			
	& 340 rpm. number of speed steps is 12 and the			1
	optimum velocity for the cutting tool is 20 m/s. The			
Q	geometric progression ratio will be	M		
A	1.361		0	1
A	1.254		1	2
A	1.123		0	3
A	1.087		0	4
	The multispeed drive with _____ is commonly			1
Q	used in machine tool drive.	M		
A	Geometric progression		1	1
A	Arithmetic progression		0	2
A	Logarithmic progression		0	3
A	Harmonic progression		0	4