GATE 2022 General Aptitude (GA)

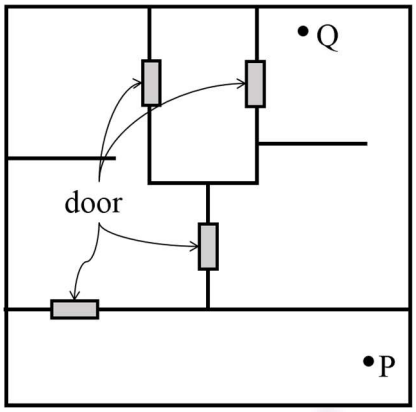
Q.1 – Q.5 Carry ONE mark each.

Q.1	Inhaling the smoke from a burning _____ could _____ you quickly.
(A)	tire / tier
(B)	tire / tyre
(C)	tyre / tire
(D)	tyre / tier

Q.2	A sphere of radius r cm is packed in a box of cubical shape. What should be the minimum volume (in cm^3) of the box that can enclose the sphere?
(A)	$\frac{r^3}{8}$
(B)	r^3
(C)	$2r^3$
(D)	$8r^3$

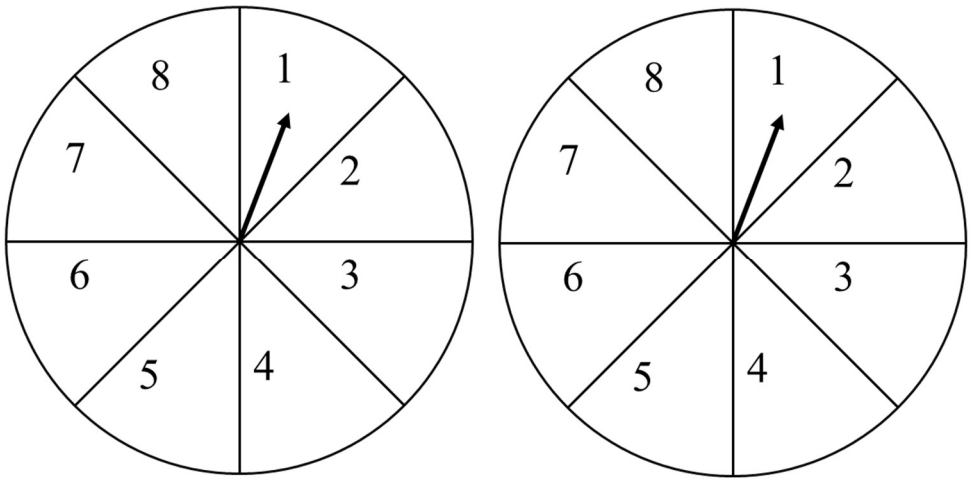
Q.3	Pipes P and Q can fill a storage tank in full with water in 10 and 6 minutes, respectively. Pipe R draws the water out from the storage tank at a rate of 34 litres per minute. P, Q and R operate at a constant rate. If it takes one hour to completely empty a full storage tank with all the pipes operating simultaneously, what is the capacity of the storage tank (in litres)?
(A)	26.8
(B)	60.0
(C)	120.0
(D)	127.5

Q.4	Six persons P, Q, R, S, T and U are sitting around a circular table facing the center not necessarily in the same order. Consider the following statements: • P sits next to S and T. • Q sits diametrically opposite to P. • The shortest distance between S and R is equal to the shortest distance between T and U. Based on the above statements, Q is a neighbor of
(A)	U and S
(B)	R and T
(C)	R and U
(D)	P and S

Q.5	A building has several rooms and doors as shown in the top view of the building given below. The doors are closed initially. What is the minimum number of doors that need to be opened in order to go from the point P to the point Q? 
(A)	4
(B)	3
(C)	2
(D)	1

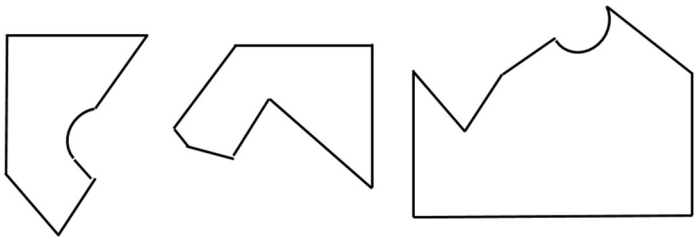
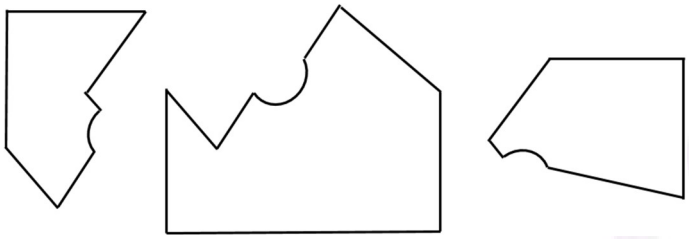
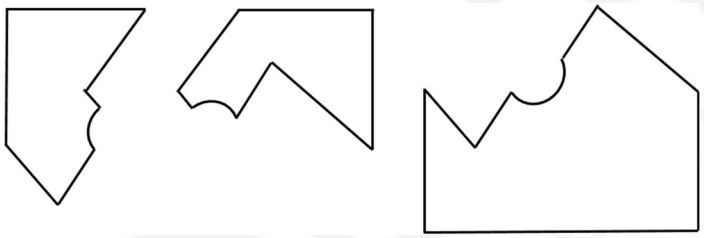
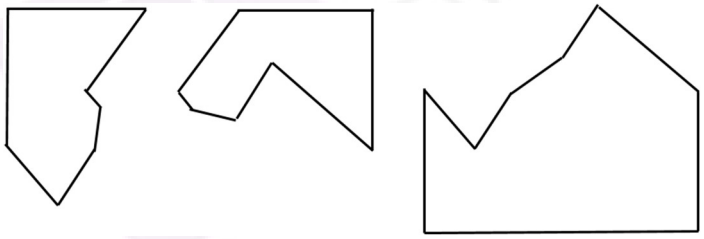
Q. 6 – Q. 10 Carry TWO marks each.

Q.6	Rice, a versatile and inexpensive source of carbohydrate, is a critical component of diet worldwide. Climate change, causing extreme weather, poses a threat to sustained availability of rice. Scientists are working on developing Green Super Rice (GSR), which is resilient under extreme weather conditions yet gives higher yields sustainably. Which one of the following is the CORRECT logical inference based on the information given in the above passage?
(A)	GSR is an alternative to regular rice, but it grows only in an extreme weather
(B)	GSR may be used in future in response to adverse effects of climate change
(C)	GSR grows in an extreme weather, but the quantity of produce is lesser than regular rice
(D)	Regular rice will continue to provide good yields even in extreme weather

Q.7	A game consists of spinning an arrow around a stationary disk as shown below. When the arrow comes to rest, there are eight equally likely outcomes. It could come to rest in any one of the sectors numbered 1, 2, 3, 4, 5, 6, 7 or 8 as shown. Two such disks are used in a game where their arrows are independently spun. What is the probability that the sum of the numbers on the resulting sectors upon spinning the two disks is equal to 8 after the arrows come to rest? 
(A)	$\frac{1}{16}$
(B)	$\frac{5}{64}$
(C)	$\frac{3}{32}$
(D)	$\frac{7}{64}$

Q.8	Consider the following inequalities. (i) $3p - q < 4$ (ii) $3q - p < 12$ Which one of the following expressions below satisfies the above two inequalities?
(A)	$p + q < 8$
(B)	$p + q = 8$
(C)	$8 \leq p + q < 16$
(D)	$p + q \geq 16$

Q.9	Given below are three statements and four conclusions drawn based on the statements. Statement 1: Some engineers are writers. Statement 2: No writer is an actor. Statement 3: All actors are engineers. Conclusion I: Some writers are engineers. Conclusion II: All engineers are actors. Conclusion III: No actor is a writer. Conclusion IV: Some actors are writers. Which one of the following options can be logically inferred?
(A)	Only conclusion I is correct
(B)	Only conclusion II and conclusion III are correct
(C)	Only conclusion I and conclusion III are correct
(D)	Either conclusion III or conclusion IV is correct

Q.10	Which one of the following sets of pieces can be assembled to form a square with a single round hole near the center? Pieces cannot overlap.
(A)	
(B)	
(C)	
(D)	

GATE 2022 Agricultural Engineering (AG)

Q.11 – Q.35 Carry ONE mark Each

Q.11	Determinant of a matrix remains unaltered if _____.
(A)	its columns and rows are interchanged
(B)	two parallel lines are identical
(C)	two parallel lines intersect
(D)	each element of a line is multiplied by the same factor
Q.12	The probability of having 53 Sundays in a randomly selected leap year is _____.
(A)	1/7
(B)	1/4
(C)	2/7
(D)	4/7

GATE 2022 Agricultural Engineering (AG)

Q.13	Function $f(x)$ by Maclaurin's series (as an infinite series) can be expressed as
(A)	$f(x) = f(1) + x\,f'(1) + \frac{x^2}{2!}\,f''(1) + \frac{x^3}{3!}\,f'''(1) + \cdots + \infty$
(B)	$f(x) = f(0) + x\,f'(0) + \frac{x^2}{2!}\,f''(0) + \frac{x^3}{3!}\,f'''(0) + \cdots + \infty$
(C)	$f(x) = f(1) - x\,f'(1) + \frac{x^2}{2!}\,f''(1) - \frac{x^3}{3!}\,f'''(1) + \cdots + \infty$
(D)	$f(x) = f(0) - x\,f'(0) + \frac{x^2}{2!}\,f''(0) - \frac{x^3}{3!}\,f'''(0) + \cdots + \infty$
Q.14	The lowest temperature at which the fuel ceases to flow is known as _____.
(A)	Pour point
(B)	Cloud point
(C)	Flash point
(D)	Boiling point

GATE 2022 Agricultural Engineering (AG)

Q.15	Complement of the Solar Altitude angle is _____.
(A)	Zenith angle
(B)	Azimuth angle
(C)	Hour angle
(D)	Profile angle
Q.16	Annual cost of owning (fixed cost) a particular combine harvester is Rs. 3,00,000 whereas, operating it would cost additional Rs. 6,000 per hectare. If an entrepreneur wishes to offer the machine for custom hiring, the combination of annual use (ha) and custom rate (Rs. ha^{-1}), respectively, that would fetch him the break-even condition is _____.
(A)	200 and 7,500
(B)	210 and 6,300
(C)	180 and 9,200
(D)	250 and 6,100

GATE 2022 Agricultural Engineering (AG)

Q.17	In construction of gravel packed wells, the pack-aquifer ratio is generally defined as _____.
(A)	$\frac{\text{50\% of the size of gravel pack}}{\text{50\% of the size of aquifer}}$
(B)	$\frac{\text{60\% of the size of gravel pack}}{\text{10\% of the size of aquifer}}$
(C)	$\frac{\text{50\% of the size of aquifer}}{\text{50\% of the size of gravel pack}}$
(D)	$\frac{\text{60\% of the size of aquifer}}{\text{10\% of the size of gravel pack}}$
Q.18	The shape of falling limb of a hydrograph is dependent on _____.
(A)	basin and storm characteristics
(B)	storm characteristics only
(C)	basin characteristics only
(D)	direction of the rainfall only

GATE 2022 Agricultural Engineering (AG)

Q.19	Energy requirement (E) to produce a change (dX) in dimension X of a particular size can be expressed as $\frac{dE}{dX} = -\frac{C}{X^n}$, where, c is constant and n according to Rittinger's law is _____.
(A)	$\frac{1}{2}$
(B)	$\sqrt{2}$
(C)	$\frac{3}{2}$
(D)	2
Q.20	The ratio of inertial forces to viscous forces is knows as _____.
(A)	Froude number
(B)	Reynolds number
(C)	Power number
(D)	Biot number
Q.21	The root of the equation $\sin x - 4x + 1 = 0$ after its first iteration, using Newton-Raphson method with an initial guess of $x_0 = 0.2$, is _____. [*round off to three decimal places*]
Q.22	The slope of the function $f(x) = 2x^4 - 3x^2 + 5x$ at $x = 2$ is _____. [*Answer in integer*]

GATE 2022 Agricultural Engineering (AG)

Q.23	A single cylinder four-stroke diesel engine has an engine displacement volume of 9 L, the engine rotates at 2400 rpm and its volumetric efficiency is 88%. The actual air inducted into the cylinder in $m^3\ s^{-1}$ is _____. [*round off to three decimal places*]
Q.24	A two-wheel drive tractor is fitted with driving wheels having rolling radius of 860 mm. The effective gear ratio between the engine to the drive wheels is 98:1 and the power transmission efficiency at that gear ratio is 86%. If the engine torque is 520 N m, the ground thrust developed by the drive wheels in kN is _____. [*round off to two decimal places*]
Q.25	A double acting hydraulic cylinder has bore and rod diameter of 76 mm and 25 mm, respectively. In extension as well as retraction strokes of the cylinder, the oil flow rate to the cylinder from the pump is 40 L min^{-1}. The velocity of the piston during retraction stroke in m s^{-1} is_____. [*round off to two decimal places*] (Take $\pi = 3.14$)
Q.26	An open V-belt is wrapped around V-pulleys having effective diameters of 0.25 m and 0.65 m, and their centres are 1 m apart. Assuming ideal conditions, the wrap angle in degree for the smaller pulley is _____. [*round off to two decimal places*] (Take $\pi = 3.14$)
Q.27	Water from a confined aquifer having transmissivity of 1000 $m^2\ day^{-1}$ is pumped through a fully penetrating well of 300 mm diameter at a rate of 1200 $m^3\ day^{-1}$. If the radius of influence is 400 m, the drawdown in the well under steady-state flow condition in meter is _____. [*round off to two decimal places*] (Take $\pi = 3.14$)

GATE 2022 Agricultural Engineering (AG)

Q.28	A stream of 200 L s^{-1} is diverted from a canal to irrigate a wheat field in 8 hours. If the runoff from the field is 500 m^3 and the conveyance efficiency is 75%, the application efficiency in per cent is _____. [*round off to two decimal places*]
Q.29	The flow rate per unit width of a wide rectangular clean-earth channel is 20 m^3 s^{-1} m^{-1}. The calculated critical flow depth in meter will be _____. [*round off to two decimal places*] (Take g = 9.81 m s^{-2})
Q.30	The ratio of soil loss from the field plot length to that from the unit plot with a slope length of 22.13 m is 0.5. If the slope length from the watershed divide is 600 m and the slope gradient is 8%, the topographic factor in the Universal Soil Loss Equation is _____. [*round off to two decimal places*]
Q.31	The area of a rectangular field was measured using a 30 m survey chain, which was later found to be 5 cm short. If the length and width of the field measured using this chain were 542 m and 554 m, respectively, the true area of the field in ha is_____. [*round off to two decimal places*]
Q.32	In a triple effect feed forward evaporator, pineapple juice is entering at the rate of 6.3 kg s^{-1} and leaving the last effect as 50% concentrate. The system is using saturated steam of 2.48 kg s^{-1} at 121.1 ºC. If vapour transferred from the first to the second effect, second to third effect and third to ambient are 5675, 6053 and 6416 kg h^{-1}, respectively, the steam economy of the evaporator is _____. [*round off to two decimal places*]

GATE 2022 Agricultural Engineering (AG)

Q.33	If an osmo-dehydrated fruit slice has 72% moisture content on wet basis, the moisture content of the same fruit slice on dry basis in per cent is _____. [*round off to one decimal place*]
Q.34	If the specific heat capacity (c_p) of solids in potato is 837.36 J kg^{-1} K^{-1}, then the specific heat capacity of potatoes in J kg^{-1} K^{-1} with 85% moisture content (wet basis) is _____. [*round off to two decimal places*]
Q.35	A milk sample contains 4×10^5 spores of *C. botulinum* (D value of 1.2 min at 121.1 °C) and 7×10^6 spores of *L. monocytogenes* (D value of 0.9 min at 121.1 °C) per mL. If the milk is heated at a uniform temperature of 121.1 °C to obtain a probability of spoilage of 1 in 1000 cans, the minimum heating duration in minutes is _____. [*round off to two decimal places*]

GATE 2022 Agricultural Engineering (AG)
Q.36 – Q.65 Carry TWO marks Each

Q.36	The function $(x-2)^2(x+2)^2$ has
(A)	minima at +2 and maxima at -2
(B)	minima at -2 and maxima at +2
(C)	minima at -2 and +2
(D)	maxima at -2 and +2
Q.37	The matrix $\begin{bmatrix} (3-x) & 2 & 2 \\ 2 & (4-x) & 1 \\ -2 & -4 & (-1-x) \end{bmatrix}$ is singular for the following values of x
(A)	$x = 0$ and $x = 3$
(B)	$x = 0$ and $x = -3$
(C)	$x = 0$ and $x = 6$
(D)	$x = 0$ and $x = -6$

GATE 2022 Agricultural Engineering (AG)

Q.38	A 5 × 20 cm seed drill has a ground drive wheel of rolling diameter 0.5 m. While testing under laboratory condition, 320 g of seeds were collected in 20 revolutions of the ground drive wheel. The same seed drill when operated in a 2 ha field, amount of seeds dropped was found to be 185 kg. The variation in the seed dropped between laboratory and field conditions due to skid of ground drive wheel is _____ (Take $\pi = 3.14$)
(A)	6.38%
(B)	9.23%
(C)	10.17%
(D)	12.26%
Q.39	A 3.6 m combine harvester was tested over a crop strip of 20 m length and the following data were obtained while testing: Total material left over walker = 8.5 kg Free seed over walker = 100 g Unthreshed seed over walker = 50 g Total material left over shoe = 5.5 kg Free seed over shoe = 250 g Unthreshed seed over shoe = 80 g Total seed collected in the grain tank = 16.5 kg The grain yield (tonne ha^{-1}) and cylinder loss (%), respectively, are
(A)	2.36 and 0.77
(B)	4.24 and 0.29
(C)	6.28 and 0.47
(D)	8.05 and 2.82

GATE 2022 Agricultural Engineering (AG)

Q.40	An ideal gas is compressed adiabatically (Adiabatic exponent γ =1.4) from 98 kPa to 480 kPa and the specific volume of the gas at the beginning of the compression stroke is 0.45 m^3 kg^{-1}. The specific work done on the gas in kJ kg^{-1} is _____.
(A)	12.6
(B)	18.5
(C)	25.4
(D)	63.3
Q.41	A sample of 90% saturated clay soil has void ratio and specific gravity of 0.8 and 2.7, respectively. The bulk unit weight of soil in N m^{-3} is _____. (Take unit weight of water = 9.81×10^3 N m^{-3})
(A)	10594.80
(B)	18639.00
(C)	18.64
(D)	10.60

GATE 2022 Agricultural Engineering (AG)

Q.42	A parabolic shaped grass-waterway is to be designed to carry a flow of 2.85 $m^3 s^{-1}$ down the slope of 3%. The permissible velocity of water in the waterway is 1.78 m s^{-1}. If the freeboard depth is excluded, the most appropriate top width in m and depth in m, respectively are (Take Manning's roughness coefficient = 0.04)
(A)	4 and 0.6
(B)	6 and 0.4
(C)	7 and 0.5
(D)	5.5 and 0.6
Q.43	The pressure drop through a well-designed constriction is to be used for measuring the velocity of flow through a circular pipe. If the pressure drop from a 0.1 m diameter section to a 0.05 m diameter section of the pipe is 7.5 kPa, the velocity in m s^{-1} in the 0.1 m diameter section of the pipe is _____. (Take density of liquid = 1000 kg m^{-3})
(A)	0.5
(B)	1.0
(C)	1.5
(D)	2.0

GATE 2022 Agricultural Engineering (AG)

Q.44	The water activity of potato is 0.942. As per Raoult's law, the most efficient solution for osmotic dehydration of potato is _____. (Molar mass of sucrose = 342 g mole^{-1}, and NaCl = 58.5 g mole^{-1})
(A)	20% sucrose solution
(B)	20% NaCl solution
(C)	10% sucrose solution + 10% NaCl solution
(D)	15% sucrose solution + 5% NaCl solution
Q.45	The mass fraction retained on the ith sieve is x_i and $\overline{D_{pi}}$ is the average opening size of ith and (i-1)th sieves. The volume surface mean diameter ($\overline{D_s}$) of particles retained on n number of sieves is _____.
(A)	$\overline{D_s} = \frac{1}{\sum_{i=1}^{n}\left(\frac{x_i}{\overline{D_{pi}}}\right)}$
(B)	$\overline{D_s} = \sum_{i=1}^{n} x_i \overline{D_{pi}}$
(C)	$\overline{D_s} = \left[\frac{1}{\sum_{i=1}^{n}\left(\frac{x_i}{\overline{D_{pi}}^3}\right)}\right]^{1/3}$
(D)	$\overline{D_s} = \left[\frac{1}{\sum_{i=1}^{n}\left(\frac{x_i}{\overline{D_{pi}}^3}\right)}\right]^{2/3}$

GATE 2022 Agricultural Engineering (AG)

Q.46 Match the following reactants in Column I with the most appropriate purpose used in processing as mentioned in Column II

	Column I		Column II
I	Vitamin E	P	fumigant for insect killing
II	Calcium salts	Q	reduces shrinkage losses
III	Edible waxes	R	antioxidant with vitamin A in oils
IV	Methyl Bromide	S	firming agent in fruits

(A) I-P, II-S, III-Q, IV-R

(B) I-R, II-Q, III-S, IV-P

(C) I-P, II-Q, III-S, IV-R

(D) I-R, II-S, III-Q, IV-P

Q.47 Work done by a moving particle in the force field $\overline{\boldsymbol{F}} = 6x^2\hat{\boldsymbol{i}} + (3xz + y)\hat{\boldsymbol{j}} + 4z\hat{\boldsymbol{k}}$, moving along the straight line from (0,0,0) to (1,2,3) is _____. [*Answer in integer*]

Q.48 The power consumption readings (in watt) by an instrument at fixed intervals of time (in seconds) are tabulated below:

Time (s)	0.0	0.6	1.2	1.8	2.4	3.0	3.6
Power consumption (W)	8.6	9.2	7.8	6.4	7.2	8.6	11.2

Using Simpson's 1/3rd rule, the energy expenditure of the instrument in joule is _____. [*round off to two decimal places*]

GATE 2022 Agricultural Engineering (AG)

Q.49	The root mean square acceleration for mechanical vibration of a tractor is 3.15 m s^{-2} and its frequency is 80 Hz. The root mean square amplitude of the vibration in μm is _____. [*round off to two decimal places*] (Take π = 3.14)
Q.50	The static weight on front and rear axles of a two-wheel drive tractor are 3 kN and 9 kN, respectively. The wheel-base of the tractor is 2.1 m and the tractor pulls a load of 7.5 kN. The perpendicular distance from the front wheel ground contact point to the line of pull is 680 mm. Neglecting the wheel contact off-set on the ground, the weight transfer onto the rear axle in kN is _____. [*round off to two decimal places*]
Q.51	The crank radius and connecting rod length of an IC engine are 250 mm and 1000 mm, respectively. If the crank turns 100º from the head dead centre and the net force acting on the piston along its direction of motion is 35 kN, the turning moment of the crank shaft at that instant in kN m is _____. [*round off to two decimal places*]
Q.52	An engine develops 42 kW brake power when it runs with B20 fuel (80% biodiesel and 20% diesel by volume) with a brake thermal efficiency of 24%. The heating value of the fuel is 46.15 MJ kg^{-1} and its density is 0.845 kg L^{-1}. The fuel consumption of the engine in L h^{-1} will be _____. [*round off to two decimal places*]
Q.53	A tractor operated 12 × 60 cm boom sprayer had an overlap of 30 cm between the successive passes during field operation at an average speed of 4.2 km h^{-1}. A total time loss of 7.5 min ha^{-1} was observed during turnings. Assuming no overlap of spray material between adjacent nozzles, the field efficiency of the sprayer in per cent is _____. [*round off to two decimal places*]

GATE 2022 Agricultural Engineering (AG)

Q.54 A mild steel flange-mounted single shear pin (Ultimate shear strength = 42 MPa) of 10 mm diameter is used in a flange. The perpendicular distance between the axis of driving shaft and the shear pin axis is 100 mm. If the speed of the driving shaft is 300 rpm, the maximum power the shaft could transmit in kW before the failure of the pin is _____. [*round off to two decimal places*]

[Take $\pi = 3.14$]

Q.55 In a subsurface drainage network, 12 lateral drains each of 100 m long are laid at a spacing of 50 m. These lateral drains are connected to a collector drain. When the water table dropped 50 cm below the soil surface in 4 days, the average discharge at the outlet of the collector drain was found to be 12 L s^{-1}. The average drainable porosity of soil in per cent is _____. [*round off to two decimal places*]

Q.56 A watershed with various land uses (as specified in the table below) receives a rainfall of 152.4 mm. If an initial abstraction (I_a) is 0.2 times the potential maximum retention (S), and the antecedent moisture content (AMC) of averaged condition is assumed, the depth of runoff volume in mm is _____. [*round off to two decimal places*]

Land use (%)	Soil group	Curve number
Residential, 40%	C	83
Open space- good condition, 25%	D	80
Commercial and business, 20%	C	94
Industrial, 15%	D	93

Q.57 A trapezoidal weir has a side slope of 1 horizontal unit to 4 vertical units. The length of the weir is less than the width of the channel. If the head over the weir is 70 cm and the discharge is 0.85 m^3 s^{-1}, the length of the weir in m is _____. [*round off to two decimal places*]

(Take coefficient of discharge = 0.62 and g = 9.81 m s^{-2})

GATE 2022 Agricultural Engineering (AG)

Q.58 The ordinates of an inflow hydrograph are provided in the table below. If the routing interval (Δt) is one hour, weighting factor in Muskingham equation (X) is 0.2, and the storage-time constant (time of travel of flood wave through the channel reach) (K) is 0.7 hour, using the Muskingham method of flood routing, the ordinate of the outflow (routed) hydrograph for 2nd hour in $m^3 s^{-1}$ is _____. [*round off to two decimal places*]

Time (hour)	0	1	2	3	4	5	6	7	8	9
Inflow ($m^3 s^{-1}$)	0	23	57	119	98	71	57	28	11	0

Q.59 A sprinkler irrigation system with an irrigation efficiency of 70% is used to irrigate 16 ha of maize crop. The crop evapotranspiration of 6 mm day^{-1} is used for estimating the irrigation depth. If the irrigation system is operated 20 hours per day for 10 days, the system capacity in L s^{-1} is _____. [*round off to two decimal places*]

Q.60 A falling ball viscometer is used to determine the dynamic viscosity of sunflower oil. The viscometer has a tube length of 10 cm with the ball diameter of 0.68 mm. The densities of oil and the ball are 921 kg m^{-3} and 2420 kg m^{-3}, respectively. If the ball takes 44.5 s to fall from top of the tube, the viscosity of the oil in Pa s is _____. [*round off to three decimal places*].

(Take g = 9.81 m s^{-2})

Q.61 A cylindrical metallic silo of 3 m internal diameter and 10 m depth is loaded with maize grain having bulk density of 720 kg m^{-3}. The angle of internal friction between the maize grains is 24°, and that between the grain and wall is 22°. Using Airy's theory, the calculated lateral pressure in kPa at the bottom of the silo is _____. [*round off to two decimal place*]

(Take g = 9.81 m s^{-2})

GATE 2022 Agricultural Engineering (AG)

Q.62	Parboiled paddy is to be dried in a tray dryer under steady state conditions from an initial free moisture content of 0.40 kg H_2O (kg dry solid)$^{-1}$ to final free moisture content of 0.02 kg H_2O (kg dry solid)$^{-1}$. The dry solid mass is 99.8 kg and the top surface area for drying is 4.654 m^2. The drying is occurring in both constant and falling rate periods. If constant drying rate of 1.51 kg H_2O m^{-2} h^{-1} is followed up to a critical moisture content of 0.195 kg H_2O (kg dry solid)$^{-1}$, then the total drying time in hour will be _____. [*round off to two decimal places*]
Q.63	Sweet sorghum with an initial average particle size of 4.0 mm was pulverized using a burr mill at two different gap settings between stones. The average feed rate of the material is 200 kg h^{-1}. The resultant flour was analyzed by IS sieves for particle size determination and was found to be 0.336 mm and 0.306 mm for the first and second gap settings, respectively. Using Kick's law, if the power required to grind the sorghum at first setting is 7.2 kW, the power requirement in kW with the second setting is _____. [*round off to two decimal places*]
Q.64	A walk-in deep freezer wall is made of 120 mm thick brick layer on the outside followed by 75 mm thick concrete and 50 mm thick cork layers inside. The mean temperatures measured over inside and outside wall surfaces are −18 °C and 24 °C, respectively. The thermal conductivity of brick, concrete and cork are 0.69, 0.76 and 0.043 W m^{-1} K^{-1}, respectively. Considering one square meter wall surface area, the heat transfer rate in W is _____. [*round off to one decimal place*]
Q.65	In an effort to conserve energy, a grain dryer is being modified to reuse a part (10 m^3 s^{-1}) of the exhaust airflow at 70 ºC and 30% relative humidity. This part of exhaust is mixed with 20 m^3 s^{-1} of ambient air at 30 ºC and 60 % relative humidity. The details of the two air-stream conditions are given below.

Temperature (°C)	Relative humidity (%)	Absolute humidity (kg H_2O (kg dry air)$^{-1}$)
70	30	63.35×10^{-3}
30	60	16×10^{-3}

The absolute humidity of the mixed air will be _____. [*round off to three decimal places*]