PROVISIONAL ANSWER KEY

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Question1:-

Which of the following lists have exclusive elements from the 5M's of Management?

i. Capital, people, raw materials

ii. Raw materials, processes, equipment

iii. People, quality, equipment

iv. Procedures, equipment, capital

A:-

All of them

B:-

i and ii only

C:-

ii and iii only

D:-

iii and iv only

Correct Answer:- Option-B

Question2:-

A maximization linear programming problem with positive objective function coefficients and positive coefficients in all constraints with greater than or equal to type inequality and positive right-hand side can have :

A:-

unique optimal solution

B:-

infeasible solution

C:-

unbounded solution

D:-

degenerate solution

Correct Answer:- Option-C

Question3:-

While continuously monitoring the measured characteristics of a product during the production process the QC department suspects unintended process change and wants intervention by the plant engineers and operators. Which of the following can be the possible reasons of such a conclusion?

i. Variable control charts have points outside the lower and upper control limits

ii. Attribute control charts have points outside the lower and upper control limits

iii. All points plotted on a variable control chart are very close to the centre line such that the control limits have to be redefined

iv. Percentage rejection exceeds the allowable number

A:-

i only

B:-

i and ii only

C:-

i, ii and iii only

D:-

all of the above

Correct Answer:- Option-A

Question4:-

Check the following statement and identify which of the given combinations are correct?

i) Mean represents the mid value in a sample

ii) Median divides the sample into two equal halves

iii) Mode is the central value in a sample

iv) Mean is the most recurring value in a sample

A:-

i) alone is correct

B:-

ii) alone is correct

C:-

ii) and iv) are correct

D:-

iii) and iv) are correct

Correct Answer:- Option-B

Question5:-

A project network prepared using CPM has a certain critical duration for its completion. The same project network prepared using PERT is also similar and has the same critical duration. Check what suits better?

i) The project can always be completed exactly by the critical duration
ii) The project completion may take less time than the critical duration
iii) The project may take more than the critical duration to complete

A:-

i) alone is always correct

B:-

ii) alone is always correct

C:-

i) and ii) are correct

D:-

ii) and iii) are correct

Correct Answer:- Option-D

Question6:-

Check the statements related to ABC and VED classifications of inventory items.

i) A and V come from a common list
ii) V items coming in C class can be ignored
iii) D items in A class need to be tightly controlled
iv) A items in V class have to be loosely controlled

A:-

i) and ii) are correct

B:-

ii) and iii) are correct

C:-

iii) and iv) are correct

D:-

ii) and iv) are correct

Correct Answer:- Option-C

Question7:-

While comparing different production systems :

i) mass production is less complex and needs less number of production centres
ii) job production systems are more complex
iii) batch production and job production are two different names of a system
iv) mass production and continuous production refers to the same type of production system

A:-

all the above are correct

B:-

none of the above are correct

C:-

i) and ii) are correct

D:-

iii) and iv) are correct

Correct Answer:- Option-B

Question8:-

Method study and work study focus on

i) productivity improvement
ii) setting standard procedures
iii) identifying and eliminating foreign work elements
iv) establishing standard work elements and time for jobs

A:-

i) alone is correct

B:-

i) and ii) only are correct

C:-

iii) and iv) only are correct

D:-

all the above are correct

Correct Answer:- Option-D

Question9:-

Principles of motion economy are :

i) defined for use of body elements

ii) defined for design of tools

iii) defined for the use of work place

A:-

all the above are true

B:-

only i) and ii) are true

C:-

only ii) and iii) are true

D:-

only i) and iii) are true

Correct Answer:- Option-A

Question10:-

One of the following is exactly the list of the key elements of a company structure. Pick it out.

A:-

Chain of Command, Span of Control, Centralisation vs. Decentralisation, Departmentalisation

B:-

Span of Control, Centralisation vs. Decentralisation, Departmentalisation, Productivity

C:-

Chain of Command, Centralisation vs. Decentralisation, Departmentalisation, Productivity

D:-

Chain of Command, Span of Control, Departmentalisation, Productivity

Correct Answer:- Option-A

Question11:-

The major alloying element in Aluminium 7xxx series is

A:-

Zinc

B:-

Magnesium

C:-

Manganese

D:-

Copper

Correct Answer:- Option-A

Question12:-

Which of the following is a wrong statement regarding Iron-iron carbide system?

A:-

Ferrite has BCC structure

B:-

Austenite has FCC structure

C:-

δ-ferrite has FCC structure

D:-

γ-iron has FCC structure

Correct Answer:- Option-C

Question13:-

Reversed stress cycle means?

A:-

Stress ratio is equal to zero

B:-

Maximum and minimum stress level are asymmetrical relative to zero stress level

C:-

Mean stress is equal to one

D:-

Mean stress is equal to zero

Correct Answer:- Option-D

Question14:-

Which of the following hardness tests uses diamond pyramid indenter?

(i) Brinell hardness test

(ii) Vickers hardness test

(iii) Knoop hardness test

(iv) Rockwell hardness test

A:-

only (i)

B:-

only (ii) and (iii)

C:-

only (iv)

D:-

only (ii)

Correct Answer:- Option-B

Question15:-

Which of the following are widely used for the inspection of holes?

A:-

Sigma Comparators

B:-

Pneumatic Comparators

C:-

Johansson Mikrokator

D:-

None of the above

Correct Answer:- Option-B

Question16:-

Which of the following is not a lathe accessory?

A:-

Collet

B:-

Mandrel

C:-

Thread chasing dial

D:-

Angle plate

Correct Answer:- Option-C

Question17:-

Which of the following is not an internal grinder?

A:-

Swing frame grinder

B:-

Chucking grinder

C:-

Planetory grinder

D:-

None of the above

Correct Answer:- Option-A

Question18:-

A cutting tool gave a tool life of 49 minutes when operated at a cutting speed of 200m/min. If the cutting speed is changed to 140m/min, what will be the tool life in minutes. Assume n = 0.5

A:-

70

B:-

90

C:-

100

D:-

110

Correct Answer:- Option-C

Question19:-
Climb milling is also called

A:-

Plain milling

B:-

Slab milling

C:-

Up milling

D:-

Down milling

Correct Answer:- Option-D

Question20:-

Structure of a grinding wheel means

A:-

How closely abrasive grains are packed

B:-

Strength of the bond holding the abrasive grains

C:-

Size of the abrasive grains

D:-

Hardness of abrasive grains

Correct Answer:- Option-A

Question21:-

In power law model for Non Newtonian fluids given by $\tau = \mu \times \left(\frac{du}{dy}\right)^n$. The value of n for shear thickening fluids is

A:-

equal to 1

B:-

less than zero

C:-

greater than 1

D:-

between 0 and 1

Correct Answer:- Option-C

Question22:-

A liquid will wet a solid surface if

A:-

Adhesive Force > Cohesive force

B:-

Adhesive Force < Cohesive force

C:-

Adhesive Force = Cohesive force

D:-

None of the above

Correct Answer:- Option-A

Question23:-

A flow is categorised as compressible when

A:-

Fluid density varies by more than 5%

B:-

Flow Reynolds number is less than 4000

C:-

Flow is steady

D:-

All the above statements are correct

Correct Answer:- Option-A

Question24:-

The reading obtained from a U Tube manometer corresponds to which of the following quantities

A:-

Absolute pressure

B:-

Gauge pressure

C:-

Vacuum pressure

D:-

Atmospheric pressure

Correct Answer:- Option-B

Question25:-

Which of the following occurs when air vessels are fitted to suction and delivery side of a reciprocating pump

(i) Continuous supply of liquid is ensured

(ii) The power consumption by the pump is increased

(iii) Pump can be run at higher speeds without cavitation

A:-

(i) and (iii) are correct

B:-

(ii) and (iii) are correct

C:-

(i), (ii) and (iii) are correct

D:-

only (iii) is correct

Correct Answer:- Option-A

Question26:-

Pascal's law states that when pressure is applied to an enclosed fluid at rest, it is :

A:-

Reduced as it moves through the fluid

B:-

Transmitted only in the downward direction

C:-

Transmitted only to the walls of the container

D:-

Transmitted equally in all directions

Correct Answer:- Option-D

Question27:-

Oil is transported through a pipe of diameter 800 mm with a velocity V. The diameter of the pipe is then gradually reduced to 200 mm, now the velocity of oil in the pipe will be

A:-

4V

B:-

8V

C:-

16V

D:-

32V

Correct Answer:- Option-C

Question28:-

A jet of water strikes normally on a stationary flat plate then the force exerted by the jet on the plate depends primarily on

A:-

Pressure of water only

B:-

Rate of change of momentum of the jet

C:-

Velocity of the jet only

D:-

Area of the plate only

Correct Answer:- Option-B

Question29:-

The discharge of a single acting reciprocating pump is given by Q. If the speed is doubled and the length of stroke is halved the discharge will become

A:-

2Q

B:-

Q/4

C:-

Q/2

D:-

Q

Correct Answer:- Option-D

Question30:-

Which of the following can be inferred about the vorticity of a rotational fluid flow?

A:-

Infinite at the center of rotation

B:-

Always equal to the angular velocity of the container

C:-

Zero everywhere in the flow

D:-

Non-zero and fluid particles rotate about their own axes

Correct Answer:- Option-D

Question31:-

Initially, two planar links are separate. They are then connected by revolute joint. The number of degrees of freedom lost due to the introduction of this revolute joint is

A:-

1

B:-

2

C:-

3

D:-

0

Correct Answer:- Option-B

Question32:-

A four bar mechanism ABCD the following link length : AB = 20 mm, BC = 35 mm, CD = 45 mm and DA = 50 mm. If the link BC is fixed, the resulting mechanism will be a

A:-

Crank rocker mechanism

B:-

Double-crank mechanism

C:-

Double rocker mechanism

D:-

Non-Grashof mechanism

Correct Answer:- Option-A

Question33:-

Which of the following is the most influencing factor that determines the spring constant of a helical spring?

A:-

Rigidity modulus of the material

B:-

Mean coil diameter

C:-

Wire diameter

D:-

Number of active coils

Correct Answer:- Option-C

Question34:-

The circular pitch of spur gear is equal to π. Then its module will be

A:-

π;

B:-

$\frac{1}{\pi}$;

C:-

0.5

D:-

1

Correct Answer:- Option-D

Question35:-

The maximum and minimum energy in one cycle of operation of an engine are 2500 N.m and 1500 N.m respectively. If the total work done per cycle is 10,000 N.m, what is the coefficient of fluctuation of energy?

A:-

0.1

B:-

0.25

C:-

0.15

D:-

1%

Correct Answer:- Option-A

Question36:-

A linear elastic isotropic material is incompressible. Then its Poisson ratio is

A:-

0.5

B:-

1

C:-

0.25

D:-

infinity

Correct Answer:- Option-A

Question37:-

A block of volume $1m^3$ is experiencing strains 0.01 (tensile), 0.002 (tensile), and 0.01 (compressive) in the three mutually perpendicular X, Y and Z directions respectively. Then the change in volume for the cube is

A:-

$0.03m^3$

B:-

$0.02m^3$

C:-

$0.002m^3$

D:-

$0.01m^3$

Correct Answer:- Option-C

Question38:-

The resilience of an elastic material can be found out by integrating the stress-strain curve up to the

A:-

Fracture point

B:-

Proportionality limit

C:-

Ultimate strength point

D:-

Elastic limit

Correct Answer:- Option-D

Question39:-

Which of the following statements is/are correct about the meshing of two involute spur gears?

(i) The change of center-to-center distance does not affect the velocity ratio

(ii) The pressure angle does not change

A:-

Both are correct

B:-

Only (i) is correct

C:-

Only (ii) is correct

D:-

None of these

Correct Answer:- Option-B

Question40:-

Which of the following statements is/are correct about screw threads?

(i) For British Association thread, the angle of the thread is 55^0

(ii) For whitworth thread, the angle of the thread is 47.5^0

A:-

Both are correct

B:-

only (i) is correct

C:-

only (ii) is correct

D:-

none of these

Correct Answer:- Option-D

Question41:-

Which of the following air standard cycles have two isobaric processes and two isentropic processes?

A:-

Otto cycle

B:-

Diesel cycle

C:-

Carnot cycle

D:-

None of the above

Correct Answer:- Option-D

Question42:-

Which of the following relation is correct about specific fuel consumption (s.f.c.) and brake mean effective pressure (b.m.e.p.) in a Compression Ignition engine?

A:-

As b.m.e.p. increases, s.f.c. increases

B:-

As b.m.e.p. increases, s.f.c. decreases

C:-

As b.m.e.p. increases, s.f.c. decreases and then increases

D:-

As b.m.e.p. increases, s.f.c. increases and then decreases

Correct Answer:- Option-C

Question43:-

The gravimetric composition of air is approximated as 75% Nitrogen and 25% Oxygen, neglecting the traces of other elements. What is the amount of Nitrogen (in kg) included for complete combustion of 1 kg of Carbon, if air is used for combustion?

A:-

3.5 kg

B:-

7 kg

C:-

14 kg

D:-

28 kg

Correct Answer:- Option-B

Question44:-

An ideal refrigerant should possess :

(i) High thermal conductivity

(ii) High latent heat of vapourisation

(iii) High specific heat

Which of the above point is/are correct?

A:-

only (i) and (ii)

B:-

only (ii) and (iii)

C:-

Only (i) and (iii)

D:-

All of the above (i, ii & iii)

Correct Answer:- Option-A

Question45:-

In a psychrometric chart, the constant enthalpy line coincides with

A:-

Constant specific humidity line

B:-

Constant relative humidity line

C:-

Constant dew point temperature line

D:-

Constant wet bulb temperature line

Correct Answer:- Option-D

Question46:-

The following statements are related to Fourier law of heat conduction

(i) Heat conduction takes place at steady state.

(ii) The law is based on experimental evidence.

(iii) The law is applicable to solid, liquid or gas

Which of the above point is/are correct?

A:-

All of the above (i, ii & iii)

B:-

Only (i) and (ii)

C:-

Only (ii) and (iii)

D:-

Only (i) and (iii)

Correct Answer:- Option-A

Question47:-

A black body has the following properties :

(i) It absorbs all the incident radiation falling on it

(ii) It emits maximum amount of thermal radiations at all wavelengths at any specified temperature

(iii) The radiation emitted by a black body is independent of direction

Which of the above point is/are correct?

A:-

All of the above (i, ii & iii)

B:-

Only (i) and (ii)

C:-

Only (ii) and (iii)

D:-

Only (i) and (iii)

Correct Answer:- Option-A

Question48:-

In a double pipe heat exchanger, hot water flows at a rate of 3600 kg/h and gets cooled from $95\ ^{\circ}C$ to $65\ ^{\circ}C$. The cooling water enters at 5000 kg/h, $25\ ^{\circ}C$. What is the outlet temperature of cooling water?

A:-

21.6 $^{\circ}C$

B:-

41.6 $^{\circ}C$

C:-

46.6 $^{\circ}C$

D:-

66.6 $^{\circ}C$

Correct Answer:- Option-C

Question49:-

The volumetric efficiency in a reciprocating air compressor can be improved by the following conditions :

(i) Very high speed

(ii) Large clearance volume

(iii) Low intake air temperature

Which of the above point is/are not correct?

A:-

All of the above (i, ii & iii)

B:-

Only (i) and (ii)

C:-

Only (ii) and (iii)

D:-

Only (i) and (iii)

Correct Answer:- Option-B

Question50:-

In a four cylinder petrol engine, the standard firing order is

A:-

1-2-3-4

B:-

1-3-2-4

C:-

1-3-4-2

D:-

1-4-3-2

Correct Answer:- Option-C

Question51:-

What is the power required to pull a 3-bottom, 25 cm MB plough at a depth of 10 cm and a speed of 1 m/s in soil offering a resistance of 0.5 kg/cm^2?

A:-

2.5 hp

B:-

5 hp

C:-

7.5 hp

D:-

10 hp

Correct Answer:- Option-B

Question52:-

Which of the following statements are correct in the case of disc plough?

(i) A disc plough can be used in too hard and dry soil where a MB plough cannot penetrate

(ii) Disc plough does not work well in sticky soils

(iii) A disc plough could not work well even after a considerable part of the disc is worn off

(iv) Disc plough is not suitable for covering surface trash

A:-

(i) and (ii) are correct

B:-

(ii) and (iii) are correct

C:-

(i) and (iv) are correct

D:-

(i), (ii) and (iii) are correct

Correct Answer:- Option-C

Question53:-

What is the draft acting on a tillage implement when the pulling force is F, the vertical force is V, the side force is S, the angle of inclination of F with the horizontal in the vertical plane is θ, and its inclination in the transverse plane is Φ?

A:-

$F \cos \theta \cos \Phi$

B:-

$F \sin \theta \cos \Phi$

C:-

$F \cos \theta \sin \Phi$

D:-

$F \sin \theta \sin \Phi$

Correct Answer:- Option-A

Question54:-

Which among the following metering devices are used for precision metering of seeds?

(i) Vertical rotor type

(ii) Belt type

(iii) Pneumatic type

(iv) Internal double run type

A:-

(i), (ii) and (iii) are correct

B:-

(ii), (iii) and (iv) are correct

C:-

(i), (iii) and (iv) are correct

D:-

All are correct

Correct Answer:- Option-A

Question55:-

Which of the following statements are correct with respect to sprayers and dusters?

(i) Charging of spray or dust particles would reduce the amount of drift in electrostatic sprayers
(ii) Hydraulic atomization depends upon liquid pressure to supply atomizing energy
(iii) In gas atomization, the spray liquid is broken up by a low velocity gas stream
(iv) Liquid is fed under high pressure to the centre of a low-speed rotating device and is broken up by centrifugal force

A:-

(i), (ii) and (iii) are correct

B:-

(ii), (iii) and (iv) are correct

C:-

(ii) and (iii) are correct

D:-

(i) and (ii) correct

Correct Answer:- Option-D

Question56:-

Which of the following are the criteria specified by the BIS for mechanical grain threshers?

(i) The total grain loss should not be more than 5 per cent.

(ii) Broken grains should be less than 5 per cent.

(iii) The clean grain output should not have foreign matter more than 2 per cent.

A:-

(i) and (ii) are true

B:-

(ii) and (iii) are true

C:-

(i) and (iii) are true

D:-

All are true

Correct Answer:- Option-C

Question57:-

Name of the mower with high-speed swinging knives, operating either in horizontal plane or around horizontal cylinder is _____

A:-

Cylinder mower

B:-

Reciprocating mower

C:-

Horizontal rotary mower

D:-

Flail mower

Correct Answer:- Option-D

Question58:-

Which is the sequential order of components in the power transmission system of a 4-wheel tractor?

A:-

Engine - Clutch - Gear box - Propeller shaft - Differential - Final drive - Rear wheels

B:-

Engine - Clutch - Gear box - Differential - Final drive - Rear wheels

C:-

Engine - Clutch - Gear box - Differential - Front wheel - Final drive - Rear wheels

D:-

Engine - Clutch - Gear box - Main drive - Steering mechanism - Final drive - Driving sprocket

Correct Answer:- Option-B

Question59:-

Which of the following are the functions of differential unit in a 2WD Tractor?

(i) On strait travel, it allows both rear wheels of the Tractor to get equal power and speed

(ii) On turns, it allows the inner side drive wheel to move slower than the outer wheel

(iii) It allows both the front wheels to move at same speed on both strait path and turns

(iv) It helps in shifting the transmission gear of the Tractor

A:-

Only (i) and (ii)

B:-

Only (i), (ii) and (iv)

C:-

Only (ii), (iii) and (iv)

D:-

All the four

Correct Answer:- Option-A

Question60:-

If traction is the driving force developed by a traction device, then the ratio of the net pull produced to the dynamic normal load on the traction device is _____

A:-

Tractive efficiency

B:-

Net traction coefficient

C:-

Motion resistance ratio

D:-

Rolling resistance

Correct Answer:- Option-B

Question61:-

The horse power developed by a pair of bullocks in pulling a plough at a forward speed of 3.6 kmph is 1.2 hp. the plough makes a furrow of 20 cm wide and 10 cm deep. At this field condition; what will be the reading in the dynamometer connected between animal yolk and the plough

A:-

45 kgf and indicates unit draft

B:-

90 kgf and indicates draft

C:-

45 kgf and indicates draft

D:-

90 kgf and indicates unit draft

Correct Answer:- Option-B

Question62:-

Analyze the following statements regarding types of implements and choose the correct combination

(i) The implement is pulled and guided from a single hitch point and is never completely supported by the tractor

(ii) The linkage usually provides rotational stability about the longitudinal axis and it permits depth or height control by vertical support from the tractor, if desired, while the tool is in the operating position

(iii) In the usual situation the hinge axis is transverse at the rear of the tractor and the hitch provides rotational stability about the longitudinal axis

(iv) The implement may respond directly to tractor steering, but if a vertical hinge axis is super imposed on the horizontal axis, the rear of the implement is guided by its on wheel or wheels

A:-

(i) is trailed implement, (ii) is mounted implement, (iii) is semi mounted implement and (iv) is semi mounted implement

B:-

(i) is trailed implement, (ii) is semi mounted implement, (iii) is mounted implement and (iv) is semi mounted implement

C:-

(i) is mounted implement, (ii) is semi mounted implement, (iii) is trailed implement and (iv) is semi mounted implement

D:-

(i) is trailed implement, (ii) is semi mounted implement, (iii) is semi mounted implement and (iv) is mounted implement

Correct Answer:- Option-A

Question63:-

Which of the following methods give rapid depreciation during the early years and slower depreciation as the machine becomes older

A:-

Declining balance method, estimated value method, sum of the years digit method and straight line method

B:-

Declining balance method, straight line method and estimated value method

C:-

Straight line method and estimated value method

D:-

Declining balance method, estimated value method and sum of the years digit method

Correct Answer:- Option-D

Question64:-

Read the following statements and choose the correct answer from the given options

(i) The drawbar power output is always less than the PTO output

(ii) The sum of losses such as drive wheel slippage, tractor rolling resistance and friction losses may be represented by a coefficient known as Tractive and Transmission coefficient

(iii) Tractive and Transmission coefficient can be defined as the ratio of PTO power to drawbar power

A:-

All statements are correct

B:-

(ii) and (iii) are correct

C:-

(i) and (iii) are correct

D:-

(i) and (ii) are correct

Correct Answer:- Option-D

Question65:-

The _____ of a machine is a function of the rated width of the machine, the percentage of rated width actually utilized, the speed of travel and the amount of field time lost during the operation

A:-

Effective field capacity

B:-

Theoretical field capacity

C:-

Performance efficiency

D:-

Field efficiency

Correct Answer:- Option-A

Question66:-

The full form of ISO-the text procedures and standards for agricultural tractors is

A:-

International Standards Organization

B:-

Indian Standards Organization

C:-

International Organization for Standardization

D:-

International Organization for Standards

Correct Answer:- Option-C

Question67:-

The interaction of central vertical plane passing through the seat center-line of the theoretical pivot axis between a human torso and thighs is called

A:-

Seat Index Point (SIP)

B:-

Seat Reference Point (SRP)

C:-

Sitting Acromion Height (SAH)

D:-

Popliteal Height Sitting (PHS)

Correct Answer:- Option-A

Question68:-

The unit of Sound Pressure Level (SPL) is

A:-

N/m^2

B:-

dB

C:-

$dB.N/m^2$

D:-

$dB.m^2/N$

Correct Answer:- Option-B

Question69:-

The total energy received from the sun per unit time on a unit area, perpendicular to the rays of the sun, just outside the earth's atmosphere, at the mean distance of the earth from the sun is known as

A:-

Total Radiation

B:-

Solar Radiation Intensity

C:-

Solar Constant

D:-

Diffusivity Index

Correct Answer:- Option-C

Question70:-

The difference in the energy of an electron in the valence band and the innermost subshell of the conduction band is

A:-

Fitted valance zone

B:-

Forbidden gap

C:-

p-n junction

D:-

Plank's constant

Correct Answer:- Option-B

Question71:-

Blade stalling in wind turbines at low tip speed ratios is primarily caused by

A:-

Low drag forces acting on the blade

B:-

High axial induction factor and low angle of attack

C:-

High angle of attack due to low axial induction factor

D:-

Excessive blade pitch at the blade tip

Correct Answer:- Option-C

Question72:-

During biochemical conversion of biomass to bioethanol, inhibition of yeast fermentation at high sugar concentrations is mainly due to

A:-

Enzyme denaturation

B:-

Osmotic stress on microbial cells

C:-

Nutrient deficiency

D:-

Reduced hydrolysis rate

Correct Answer:- Option-B

Question73:-

Which of the following refers to the thermochemical process in which biomass is heated in the absence of oxygen to produce solid char, liquid bio-oil and non-condensable gases?

A:-

Pyrolysis

B:-

Gasification

C:-

Torrefaction

D:-

Combustion

Correct Answer:- Option-A

Question74:-

Assertion (A) : Anaerobic digestion proceeds most efficiently when the C:N ratio of the feedstock is maintained between 25:1 and 30:1

Reason (R) : At C:N ratios lower than 10:1, excessive ammonia is produced, which inhibits micorbial activity and reduces gas production

Choose the correct option :

A:-

Both A and R are true and R is the correct explanation of A

B:-

Both A and R are true, but R is not the correct explanation of A

C:-

A is true, but R is false

D:-

A is false, but R is true

Correct Answer:- Option-B

Question75:-

The major limitation of updraft gasifiers is that its restricts their application with high-volatility fuels because of _____

A:-

Low cold-gas efficiency

B:-

Poor ash discharge mechanism

C:-

High tar production in the product gas

D:-

Inability to handle charcoal

Correct Answer:- Option-C

Question76:-

At field capacity, the soil micro pores are filled with _____ and any further drainage is slow.

A:-

Air

B:-

Water

C:-

Air and Water

D:-

Air or water

Correct Answer:- Option-B

Question77:-

The infiltration rate of the soil _____ during the initial period of irrigation.

A:-

Decreases

B:-

Increases

C:-

Remains constant

D:-

Become zero

Correct Answer:- Option-A

Question78:-

Union of a first order and a second order stream resulted the formation of a _____ order stream.

A:-

First order

B:-

Second order

C:-

Third order

D:-

Fourth order

Correct Answer:- Option-B

Question79:-

If the velocity of runoff water is doubled its erosive capacity is _____

A:-

Doubled

B:-

Increased three times

C:-

Increased four times

D:-

Increased five times

Correct Answer:- Option-C

Question80:-

_____ is the fraction of rainfall converting into surface runoff.

A:-

Rainfall factor

B:-

Form factor

C:-

Drainage coefficient

D:-

Runoff coefficient

Correct Answer:- Option-D

Question81:-

Method of direct levelling in which the elevation of points are taken at measured intervals along a given line is called

A:-

Cross sectioning

B:-

Profile levelling

C:-

Reciprocal levelling

D:-

Precise levelling

Correct Answer:- Option-B

Question82:-

If the viscosity of a fluid is given in poise, the value should be divided by _____ to get the equivalent value in MKS units

A:-

98.1

B:-

981

C:-

9.81

D:-

100

Correct Answer:- Option-A

Question83:-

In remote sensing, the number and width of spectral bands in the sensing device is indicated by _____ resolution.

A:-

Spatial Resolution

B:-

Temporal Resolution

C:-

Radiometric resolution

D:-

Spectral resolution

Correct Answer:- Option-D

Question84:-

The line representing the sum of pressure head and datum head with respect to any reference line is called _____.

A:-

Total energy line

B:-

Contour line

C:-

Hydraulic Gradient line

D:-

Equipotential line

Correct Answer:- Option-C

Question85:-

The value of constant K in Bazin's equation for an earthen channel with rough surface is

A:-

0.11

B:-

2.36

C:-

1.54

D:-

3.17

Correct Answer:- Option-D

Question86:-

A pump is required for a sprinkler irrigation system, operating at 3 kg/cm^2 pressure. The most suitable pump type is

A:-

Propeller pump

B:-

Axial flow pump

C:-

Centrifugal pump

D:-

Mixed flow pump

Correct Answer:- Option-C

Question87:-

In drip irrigation system, which filter is essential when irrigation water contains algae and organic matter

A:-

Disc filter

B:-

Screen filter

C:-

Sand/media filter

D:-

Hydrocyclone filter

Correct Answer:- Option-C

Question88:-

A sprinkler applies water at 13 mm/hour. The infiltration rate of soil is 8 mm/hour. The field problem most likely to occur is

A:-

Runoff

B:-

Water stress

C:-

Leaching

D:-

Percolation loss

Correct Answer:- Option-A

Question89:-

A field receives 50 mm rainfall in 5 days. The losses due to evapotranspiration and deep percolation are 20% of rainfall. Calculate the drainage coefficient

A:-

6 mm/day

B:-

8 mm/day

C:-

10 mm/day

D:-

12 mm/day

Correct Answer:- Option-B

Question90:-

A monoblock centrifugal pump supplies 0.04 m^3/sec of discharge against a total head of 15m. The pump efficiency is 70%. Calculate the brake horse power required.

A:-

7.3

B:-

5.5

C:-

9.25

D:-

11.4

Correct Answer:- Option-D

Question91:-

During the drying of grains under constant drying air conditions, which of the following statements is correct?

A:-

The falling-rate period is characterised by the free movement of moisture from the grain to the air

B:-

The falling-rate period begins when the surface of the grain becomes unsaturated

C:-

Increasing air velocity has a significant effect on the drying rate during the falling-rate period

D:-

The equilibrium moisture content of the grain depends only on grain type and is independent of air conditions

Correct Answer:- Option-B

Question92:-

A uniform steel rod of length L, cross-sectional area A and Young's modulus E is subjected to an axial tensile force P. If the elongation of the rod is δ, the force-deformation relationship for the rod is given by

A:-

P = EAδ /L

B:-

P = ELAδ

C:-

P-ELδ/A

D:-

$P\text{-}AEL/\delta$

Correct Answer:- Option-A

Question93:-

During the drying of an agricultural product under constant air temperature and pressure, the equilibrium moisture content (EMC) of the material will decrease when;

A:-

The relative humidity of the drying air is increased

B:-

The air velocity over the material surface is increased

C:-

The relative humidity of the drying air is decreased

D:-

The initial moisture content of the material is increased

Correct Answer:- Option-C

Question94:-

Which of the following statements regarding the operation of an LSU drier is not correct?

A:-

It is a continuous flow-mixing type grain dryer

B:-

The drying air temperature remains constant throughout the column due to counter-current heat exchange

C:-

The grain flow rate is regulated by rollers provided at the bottom of the drying column

D:-

Layers of inverted V shaped channels are installed in the drying chamber

Correct Answer:- Option-B

Question95:-

Which of the statements given below are correct?

(i) Hammer mill utilize impact force

(ii) Ball mill uses impact and attrition force

(iii) Jaw crusher uses crushing force

(iv) Attrition mill uses shearing and rubbing force

A:-

All options are correct

B:-

Options i, ii and iii are correct

C:-

Options ii, iii and iv are correct

D:-

Options i, ii and iv are correct

Correct Answer:- Option-A

Question96:-

Considering the following statements regarding **blanching and thermal processing**.

1. Blanching is insufficient to ensure commercial sterility but adequate to inactivate polyphenol oxidase in vegetables.

2. Over-blanching may lead to increased leaching of water-soluble nutrients.

3. Blanching improves microbial lethality during canning by increasing product pH.

4. Time-temperature combinations in thermal processing are designed based on the most heat-resistant pathogenic microorganism.

Which of the statements given above are **correct?**

A:-

1 and 2 only

B:-

1, 2 and 4 only

C:-

2, 3 and 4 only

D:-

1, 2, 3 and 4

Correct Answer:- Option-B

Question97:-

Freezing preserves foods mainly by

A:-

Destroying microorganisms completely

B:-

Removing oxygen from the food system

C:-

Increasing acidity of foods

D:-

Reducing water activity through ice formation

Correct Answer:- Option-D

Question98:-

The *hysteresis effect* in drying of foods refers to

A:-

Variation in drying rate with temperature

B:-

Difference between adsorption and desorption moisture curves

C:-

Rapid moisture loss at initial drying stage

D:-

Structural collapse during drying

Correct Answer:- Option-B

Question99:-

The LSU (Louisiana State University) dryer is best classified as a

A:-

Deep bed batch dryer

B:-

Flat bed dryer

C:-

Continuous flow mixed-flow dryer

D:-

Solar grain dryer

Correct Answer:- Option-C

Question100:-

Considering the following statements concerning **grain storage technologies :**

1. Cover and Plinth storage is suitable only for short-term storage due to limited protection against insects.
2. Hermetic storage suppresses insect activity by reducing oxygen and increasing carbon dioxide concentration.
3. RCC ring bins provide better protection against rodents compared to Pusa bins.
4. Moisture migration is a major cause of spoilage in sealed hermetic storage systems

Which of the statements given above are **correct?**

A:-

1, 2 and 3 only

B:-

2 and 4 only

C:-

1, 3 and 4 only

D:-

1, 2, 3 and 4

Correct Answer:- Option-A