AGRICULTURAL ENGG N TECHNOLOGY ICAR SEPT 2022

Topic:- 10 AGRICULTURAL ENGINEERING AND TECHNOLOGY_PG

1) Which of the following is true in respect of 'Median'?

A. It is based on all observations

B. It is the best measure of central tendency

C. It is NOT at all affected by extreme values

D. It is rigidly defined

E. It coincides with the second quartile

Choose the *correct* answer from the options given below:

[Question ID = 1][Question Description = 101_31_AET_AUG22_Q01]

1. A, B and C only [Option ID = 1]
2. B, C and D only [Option ID = 2]
3. C, D and E only [Option ID = 3]
4. A, D and E only [Option ID = 4]

2) A, B and C are three mutually exclusive and exhaustive events associated with a random experiment. If P(B) = 3/2 P(A) and P(C) = 1/2 P(B), Then P(A) will be

[Question ID = 2][Question Description = 102_31_AET_AUG22_Q02]

1. 3/4 [Option ID = 5]
2. 4/13 [Option ID = 6]
3. 1/13 [Option ID = 7]
4. 1/3 [Option ID = 8]

3) Find the mean of x, if x is a Poisson variate satisfying the condition P(3)=P(4)

[Question ID = 3][Question Description = 103_31_AET_AUG22_Q03]

1. 2

   [Option ID = 9]
2. 4

   [Option ID = 10]
3. 8

   [Option ID = 11]
4. 16

   [Option ID = 12]

4) Compute $\int \log x \, dx$

[Question ID = 4][Question Description = 104_31_AET_AUG22_Q04]

1. log x -x + C [Option ID = 13]
2. xlogx -x + C [Option ID = 14]
3. logx + x + C [Option ID = 15]
4. xlogx + x + C [Option ID = 16]

5) Given below are two statements

Statement I: A function which is differentiable at a point must also be continuous at that point

Statement II: A function which is continuous at a point is not necessarily differentiable at that point

In light of the above statements, choose the *most appropriate* answer from the options given below

[Question ID = 5][Question Description = 105_31_AET_AUG22_Q05]

1. Both Statement I and Statement II are correct [Option ID = 17]
2. Both Statement I and Statement II are incorrect [Option ID = 18]
3. Statement I is correct but Statement II is incorrect [Option ID = 19]
4. Statement I is incorrect but Statement II is correct [Option ID = 20]

6) A matrix which, when multiplied by itself, yields itself is known as[Question ID = 6][Question Description = 106_31_AET_AUG22_Q06]

1. Symmetric matrix [Option ID = 21]
2. Nilpotent matrix [Option ID = 22]
3. Idempotent matrix [Option ID = 23]
4. Hermitian matrix [Option ID = 24]

7) The convergence of which of the following method depends on initial assumed value

[Question ID = 7][Question Description = 107_31_AET_AUG22_Q07]

1. Simpson Method [Option ID = 25]
2. Newton-Raphson Method [Option ID = 26]
3. Euler Method [Option ID = 27]
4. Runge-Kutta method [Option ID = 28]

8) A single phase 150 V electric motor absorbs 8.0 A while running at 1500 rev/min and developing 2.8 N-m of torque. The phase angle between voltage and current is 60^0. What is power efficiency of the motor?

[Question ID = 8][Question Description = 108_31_AET_AUG22_Q08]

1. 53% [Option ID = 29]
2. 63% [Option ID = 30]
3. 73% [Option ID = 31]
4. 83% [Option ID = 32]

9) Consider the following statements related to electric circuits

A. Leading and lagging current are phenomena that occur as a result of direct current.

B. In the case of a circuit having only resistances, the voltages and currents are in phase

C. In a purely capacitive circuit, the current will lead the voltage

D. In a purely inductive circuit, the current will lag the voltage

Choose the *correct* answer from the options given below:

[Question ID = 9][Question Description = 109_31_AET_AUG22_Q09]

1. A and B only [Option ID = 33]
2. C and D only [Option ID = 34]
3. B, C and D only [Option ID = 35]
4. A, C and D only [Option ID = 36]

10) Given below are two statements

Statement I : AC generators carry slip rings while DC generators require a commutator

Statement II: Voltage generated in any DC generator is alternating and only becomes DC after it has been rectified by the commutator.

In light of the above statements, choose the *most appropriate* answer from the options given below

[Question ID = 10][Question Description = 110_31_AET_AUG22_Q10]

1. Both Statement I and Statement II are correct [Option ID = 37]
2. Both Statement I and Statement II are incorrect [Option ID = 38]
3. Statement I is correct but Statement II is incorrect [Option ID = 39]
4. Statement I is incorrect but Statement II is correct [Option ID = 40]

11) Given below are two statements

Statement I: The accuracy of null type instruments is higher than that of deflection type instruments

Statement II: Null type instruments are more suitable to dynamic measurements compared to deflection instruments

In light of the above statements, choose the *most appropriate* answer from the options given below

[Question ID = 11][Question Description = 111_31_AET_AUG22_Q11]

1. Both Statement I and Statement II are correct [Option ID = 41]
2. Both Statement I and Statement II are incorrect [Option ID = 42]
3. Statement I is correct but Statement II is incorrect [Option ID = 43]
4. Statement I is incorrect but Statement II is correct [Option ID = 44]

12) Five percent increase in supply frequency will change the synchronous speed of motor by[Question ID = 12][Question Description = 112_31_AET_AUG22_Q12]

1. -10 % [Option ID = 45]
2. + 10 % [Option ID = 46]
3. - 5 % [Option ID = 47]
4. + 5 % [Option ID = 48]

13) Given below are two statements, one is labelled as Assertion A and the other is labelled as Reason R

Assertion A : DC series motors are suitable for buses, trolleys and trains.

Reason R : DC series motors are variable speed motors.

In light of the above statements, choose the *correct* answer from the options given below

[Question ID = 13][Question Description = 113_31_AET_AUG22_Q13]

1. Both **A** and **R** are true and **R** is the correct explanation of **A** [Option ID = 49]
2. Both **A** and **R** are true but **R** is NOT the correct explanation of **A** [Option ID = 50]
3. **A** is true but **R** is false [Option ID = 51]
4. **A** is false but **R** is true [Option ID = 52]

14) Consider the following statements about DC motors and generators

A. Starting torque of series motor is considerably greater than shunt motor

B. Armature is the rotating part of DC generator

C. In series motor, the field is connected in series with armature

D. Series motors are not suitable to drive devices which must run at high speed at light loads.

E. In shunt motor, torque is independent of armature current.

Choose the *correct* answer from the options given below:

[Question ID = 14][Question Description = 114_31_AET_AUG22_Q14]

1. B, C and D only

   [Option ID = 53]
2. C, D and E only

   [Option ID = 54]
3. A, B and C only

   [Option ID = 55]
4. A, D and E only

   [Option ID = 56]

15) Match List I with List II

List I	List II
Measuring system	Measurment conversion process
A. Pitot tube	I. Temperature to electric current
B. Bourdon tube	II. Force to displacement
C. Thermocouple	III. Velocity to force
D. Vanes	IV. Velocity to pressure
E. Spring	V. Pressure to displacement

Choose the correct answer from the options given below:

[Question ID = 15][Question Description = 115_31_AET_AUG22_Q15]

1. A - IV, B - V, C - I, D - III, E - II [Option ID = 57]
2. A - III, B - II, C - I, D - IV, E - V [Option ID = 58]
3. A - V, B - IV, C - III, D - I, E - II [Option ID = 59]
4. A - V, B - III, C - IV, D - II,E - I [Option ID = 60]

16) The addition of two binary quantities $(10011)_2$ and $(1111)_2$ will be[Question ID = 16][Question Description = 116_31_AET_AUG22_Q16]

1. 100010 [Option ID = 61]
2. 110010 [Option ID = 62]
3. 100011 [Option ID = 63]
4. 101011 [Option ID = 64]

17) Which of the following are interrupt inputs of 8085 microporcessor?

A. TRAP

B. RST 7.5

C. RST 10.5

D. RST 5.5

E. INTR

Choose the *correct* answer from the options given below:

[Question ID = 17][Question Description = 117_31_AET_AUG22_Q17]

1. A and E only [Option ID = 65]
2. B, C and D only [Option ID = 66]
3. A, B, D and E only [Option ID = 67]
4. A, C and E only [Option ID = 68]

18) Consider the following statement(s) for its correctness.

A. In kinematic chain, the relative motion between the links is completely constrained.

B. A kinematic chain is known as mechanism when all of the links are fixed.

C. The mechanism forms a structure when number of degrees of freedom is zero

D. In kinematic chain, quaternary joint is equivalent to two binary joints

Choose the *correct* answer from the options given below:

[Question ID = 18][Question Description = 118_31_AET_AUG22_Q18]

1. A and C only [Option ID = 69]
2. B and D only [Option ID = 70]
3. C and D only [Option ID = 71]
4. A and B only [Option ID = 72]

19) An engine running at 150 rpm drives a line shaft by means of a belt. The engine pulley is 750 mm diameter and the pulley on the line shaft being 450 mm. A 900 mm diameter pulley on the line shaft drives a 150 mm pulley keyed to a dynamo shaft. The speed of dynamo shaft in rpm will be

[Question ID = 19][Question Description = 119_31_AET_AUG22_Q19]

1. 750 [Option ID = 73]
2. 1000 [Option ID = 74]
3. 1500 [Option ID = 75]
4. 3000 [Option ID = 76]

20) Given below are two statements

Statement I: The function of governor is to regulate mean speed of engine when there are variations in load

Statement II: A governor is said to be hunting if the speed of engine remains constant at the mean speed

In light of the above statements, choose the *most appropriate* answer from the options given below

[Question ID = 20][Question Description = 120_31_AET_AUG22_Q20]

1. Both Statement I and Statement II are correct [Option ID = 77]
2. Both Statement I and Statement II are incorrect [Option ID = 78]
3. Statement I is correct but Statement II is incorrect [Option ID = 79]
4. Statement I is incorrect but Statement II is correct [Option ID = 80]

21) Given below are two statements

Statement I: In parallel flow heat exchanger the exit temperature of cold fluid can exceed that of hot fluid

Statement II: In counter flow heat exchanger the exit temperature of cold fluid cannot be higher than that of hot fluid

In light of the above statements, choose the *most appropriate* answer from the options given below

[Question ID = 21][Question Description = 121_31_AET_AUG22_Q21]

1. Both Statement I and Statement II are correct [Option ID = 81]
2. Both Statement I and Statement II are incorrect [Option ID = 82]
3. Statement I is correct but Statement II is incorrect [Option ID = 83]

4. Statement I is incorrect but Statement II is correct [Option ID = 84]

22) Match List I with List II

List I	List II
Process/Systems	Characteristic
A. Adiabatic process	I. Heat transfer is zero
B. Isolated system	II. Work done is zero
C. Isothermal process	III. Change in internal energy is zero
D. Isochoric process	IV. No exchange of heat and matter

Choose the correct answer from the options given below:

[Question ID = 22][Question Description = 122_31_AET_AUG22_Q22]

1. A - IV, B - III, C - I, D - II [Option ID = 85]
2. A - III, B - II, C - IV, D - I [Option ID = 86]
3. A - II, B - I, C - IV, D - III [Option ID = 87]
4. A - I, B - IV, C - III, D - II [Option ID = 88]

23) Given below are two statements, one is labelled as Assertion A and the other is labelled as Reason R

Assertion A : Bodies radiate heat at all temperatures

Reason R : Rate of radiation of heat is proportional to the fourth power of absolute temperature

In light of the above statements, choose the *correct* answer from the options given below

[Question ID = 23][Question Description = 123_31_AET_AUG22_Q23]

1. Both **A** and **R** are true and **R** is the correct explanation of **A** [Option ID = 89]
2. Both **A** and **R** are true but **R** is NOT the correct explanation of **A** [Option ID = 90]
3. **A** is true but **R** is false [Option ID = 91]
4. **A** is false but **R** is true [Option ID = 92]

24) The assumptions made in derivation of Bernoulli's theorem are

A. The fluid is ideal i.e viscosity is zero

B. The flow is steady

C. The flow is incompressible

D. The flow is irrotational

E. The flow is compressible

Choose the *correct* answer from the options given below:

[Question ID = 24][Question Description = 124_31_AET_AUG22_Q24]

1. B and C only [Option ID = 93]
2. A, B, D and E only [Option ID = 94]
3. A, B, C and D only [Option ID = 95]
4. A, B and E only [Option ID = 96]

25) Given below are two statements

Statement I: Continuity equation is based on conservation of mass while Bernoulli's equation is based on conservation of energy.

Statement II: Bernoulli's equation is applicable to venturimeter as well as to orifice meter

In light of the above statements, choose the *most appropriate* answer from the options given below

[Question ID = 25][Question Description = 125_31_AET_AUG22_Q25]

1. Both Statement I and Statement II are correct [Option ID = 97]
2. Both Statement I and Statement II are incorrect [Option ID = 98]
3. Statement I is correct but Statement II is incorrect [Option ID = 99]
4. Statement I is incorrect but Statement II is correct [Option ID = 100]

26) A sample of silt clay has a volume of 15.0 cm^3, total mass of 30.0 g, a dry mass of 27.0 g and specific gravity of 2.7. The void ratio will be

[Question ID = 26][Question Description = 126_31_AET_AUG22_Q26]

1. 0.3 [Option ID = 101]

2. 0.4 [Option ID = 102]
3. 0.5 [Option ID = 103]
4. 0.6 [Option ID = 104]

27) Which of the following corrections are applied to hydrometer readings during sedimentation analysis

A. Temperature correction

B. Meniscus correction

C. Humidity correction

D. Moisture correction

E. Deflocculating agent correction

Choose the *correct* answer from the options given below:

[Question ID = 27][Question Description = 127_31_AET_AUG22_Q27]
1. B, C and D only [Option ID = 105]
2. A and D only [Option ID = 106]
3. A, B, C and D only [Option ID = 107]
4. A, B and E only [Option ID = 108]

28) Given below are two statements

Statement I: The lateral pressure exerted by the soil when the retaining wall moves away from the back fill, is generally known as active earth pressure of the soil

Statement II: Rankine's theory of earth pressure assumes that the back of the wall is horizontal and smooth

In light of the above statements, choose the *most appropriate* answer from the options given below

[Question ID = 28][Question Description = 128_31_AET_AUG22_Q28]
1. Both Statement I and Statement II are correct [Option ID = 109]
2. Both Statement I and Statement II are incorrect [Option ID = 110]
3. Statement I is correct but Statement II is incorrect [Option ID = 111]
4. Statement I is incorrect but Statement II is correct [Option ID = 112]

29) The minimum water content at which the soil just begins to crumble when rolled into thread of 3 mm in diameter is known as[Question ID = 29][Question Description = 129_31_AET_AUG22_Q29]
1. Liquid limit [Option ID = 113]
2. Plastic limit [Option ID = 114]
3. Shrinkage limit [Option ID = 115]
4. Permeability limit [Option ID = 116]

30) Consider the following statement(s) for its correctness.

A. At neutral axis there is no stress of any kind.

B. Neutral axis of a section always passes through its centroid.

C. Moment of any area about an axis passing through its centroid is equal to zero

D. According to theory of simple bending, all layers above the neutral axis are subjected to compression

E. In case of symmetrical section like square, rectangle and circle the neutral axis passes through geometric centre.

Choose the *correct* answer from the options given below:

[Question ID = 30][Question Description = 130_31_AET_AUG22_Q30]
1. A and C only [Option ID = 117]
2. B and D only [Option ID = 118]
3. B, C and E only [Option ID = 119]
4. A, B, C, D and E [Option ID = 120]

31) The cost of operation of an implement in an area of Y hectare is given by 20 + 15Y, while the revenue from the area is given by 200 + 5Y. What will be the total area of operation by the machine to achieve break even?[Question ID = 31] [Question Description = 131_31_AET_AUG22_Q31]
1. 9 ha [Option ID = 121]
2. 10 ha [Option ID = 122]
3. 15 ha [Option ID = 123]
4. 18 ha [Option ID = 124]

32) In hill dropping method of sowing, group of seeds are dropped at

[Question ID = 32][Question Description = 132_31_AET_AUG22_Q32]

1. fixed spacing [Option ID = 125]
2. continuous stream [Option ID = 126]
3. ridge and valley [Option ID = 127]
4. variable spacing [Option ID = 128]

33) Thermal efficiency of a spark ignition engine increases with the increase of

[Question ID = 33][Question Description = 133_31_AET_AUG22_Q33]

1. compression ratio

   [Option ID = 129]
2. speed

   [Option ID = 130]
3. atmospheric temperature

   [Option ID = 131]
4. cylinder dimensions

   [Option ID = 132]

34) The main drive wheel diameter of a 7×20 cm seed-drill is 140 cm. During calibration, the total weight of grain collected after 20 revolution of drive wheel is 0.154 kg. Calculate the seed rate in kg per hectare for the seed-drill neglecting wheel slippage.

[Question ID = 34][Question Description = 134_31_AET_AUG22_Q34]

1. 10.0 [Option ID = 133]
2. 12.5 [Option ID = 134]
3. 20.0 [Option ID = 135]
4. 25.0 [Option ID = 136]

35) A pair of bullocks exerts 120 kg pull at 30° to the vertical. The speed of ploughing is 1.35 kmph and V-shape furrow having 25 cm width and 10 cm depth is formed. Calculate the horse power developed by the bullocks.[Question ID = 35] [Question Description = 135_31_AET_AUG22_Q35]

1. 0.3 [Option ID = 137]
2. 0.6 [Option ID = 138]
3. 1.0 [Option ID = 139]
4. 1.2 [Option ID = 140]

36) What percentage of incoming solar radiation on earth is reflected back to space?[Question ID = 36][Question Description = 136_31_AET_AUG22_Q36]

1. 25 [Option ID = 141]
2. 30 [Option ID = 142]
3. 35 [Option ID = 143]
4. 40 [Option ID = 144]

37) The handle height of a push-pull type mannual weeder for workers with average acromial height of 135 cm need to be

[Question ID = 37][Question Description = 137_31_AET_AUG22_Q37]

1. 75 cm [Option ID = 145]
2. 95 cm [Option ID = 146]
3. 115 cm [Option ID = 147]
4. 135 cm [Option ID = 148]

38) Transmissibility of vibration intensity from tractor body to driver seat is a function of

A. Damping ratio

B. Chasis frequency

C. Undamped natural frequency of seat

D. Input amplitude of vibration

Choose the *correct* answer from the options given below:

[Question ID = 38][Question Description = 138_31_AET_AUG22_Q38]

1. B and C only [Option ID = 149]

2. A and D only [Option ID = 150]
3. A, B and C only [Option ID = 151]
4. B, C and D only [Option ID = 152]

39) Match List I with List II

List I	List II
A. Pyrheliometer	I. Chemical energy
B. Rotor	II. Beam radiation
C. Fuel cell	III. wind turbine
D. Gasification	IV. Photon energy of light
E. Solar cell	V. Biomass

Choose the correct answer from the options given below:

[Question ID = 39][Question Description = 139_31_AET_AUG22_Q39]
1. A -II , B - III, C -I , D - V, E - IV [Option ID = 153]
2. A - I, B - II, C - V, D - III, E - IV [Option ID = 154]
3. A - III, B - IV, C - V, D - I, E - II [Option ID = 155]
4. A - IV, B - V, C - I, D - II, E - III [Option ID = 156]

40) The Indian tractor drivers have suffered more than 70% of spine deformation. This type of deformation occurs due to:

A. Vibration

B. Shock

C. Bad sitting posture

Choose the *correct* answer from the options given below:

[Question ID = 40][Question Description = 140_31_AET_AUG22_Q40]
1. A and B only [Option ID = 157]
2. A only [Option ID = 158]
3. C only [Option ID = 159]
4. B and C only [Option ID = 160]

41) Which of the following term indicates the adaptibility of a particular field to row crop operations?

[Question ID = 41][Question Description = 141_31_AET_AUG22_Q41]
1. Field machine index [Option ID = 161]
2. Field performance index [Option ID = 162]
3. Machine performance index [Option ID = 163]
4. Mechanization Index [Option ID = 164]

42) Given below are two statements, one is labelled as Assertion A and the other is labelled as Reason R
Assertion A : Operating with restrained links rather than free links provides greater tractive ability

Reason R : Operating with restrained links increases the vertical load on the tractor rear wheels.

In light of the above statements, choose the *correct* answer from the options given below

[Question ID = 42][Question Description = 142_31_AET_AUG22_Q42]
1. Both **A** and **R** are true and **R** is the correct explanation of **A** [Option ID = 165]
2. Both **A** and **R** are true but **R** is NOT the correct explanation of **A** [Option ID = 166]
3. **A** is true but **R** is false [Option ID = 167]
4. **A** is false but **R** is true [Option ID = 168]

43) Consider the following statements

A. Effective operating time per hectare is less than the theoretical time per hectare if less than the full rated width is utilized

B. Disc blades sharpened from the concave side penetrate more readily than disk blades sharpened from convex side

C. Scouring occurs as long as the frictional resistance at the soil tool interface is less than resistance at soil-soil interface

D. Small diameter discs penetrate more readily than large discs

Choose the *correct* answer from the options given below:

[Question ID = 43][Question Description = 143_31_AET_AUG22_Q43]
1. A, B and C only [Option ID = 169]

2. B, C and D only [Option ID = 170]
3. A, C and D only [Option ID = 171]
4. A, B and D only [Option ID = 172]

44) In which of the following methods the depreciation for any year is taken as a constant percentage of the remaining value at the beginning of that year?

[Question ID = 44][Question Description = 144_31_AET_AUG22_Q44]

1. Straight line method [Option ID = 173]
2. Declining balance method [Option ID = 174]
3. Estimated value method [Option ID = 175]
4. Sum-of-the-years-digits method [Option ID = 176]

45) Which of the following are bulk flow seed metering systems?

A. Flutted roller

B. Inclined plate planter

C. Pneumatic seed metering

D. Internal double run type

E. Stationary opening with agitator

Choose the *correct* answer from the options given below:

[Question ID = 45][Question Description = 145_31_AET_AUG22_Q45]

1. A, B, C and D only

   [Option ID = 177]
2. A, D and E only

   [Option ID = 178]
3. E only

   [Option ID = 179]
4. B, C and D only

   [Option ID = 180]

46) Match List I with List II

List I	List II
Mouldboard type	Characteristics
A. General prupose	I. Short and relatively broad mould board curved abruptly near the top and gives thorough pulverization
B. Stubble	II. Preferred for more sticky soils where it is difficult to scour.
C. Sod	III. Medium curvature, turns the soil gently and gives medium pulverization
D. Slat	IV. Long moldboard and gives thorough turning but less pulverization

Choose the correct answer from the options given below:

[Question ID = 46][Question Description = 146_31_AET_AUG22_Q46]

1. A-IV, B-I, C-III, D-II

   [Option ID = 181]
2. A-II, B-IV, C-I, D-III

   [Option ID = 182]
3. A-III, B-I, C-IV, D-II

   [Option ID = 183]
4. A-III, B-IV, C-II, D-I

   [Option ID = 184]

47) Consider the following statement(s) for its correctness.

A. Weight transfer involves reduction of soil reaction at front wheels and corresponding increase of soil reaction at rear wheels of tractor

B. Weight transfer involves reduction of soil reaction at rear wheels and corresponding increase of soil reaction at front wheels of tractor

C. Weight transfer is not helpful in 4 wheel drive (WD) tractors

D. Weight transfer is not helpful for 2 wheel drive (WD) tractors

E. Weight transfer is helpful for 2 wheel drive (WD) tractors

F. Weight transfer is helpful for 4 wheel drive (WD) tractors

Choose the *correct* answer from the options given below:

[Question ID = 47][Question Description = 147_31_AET_AUG22_Q47]

1. A, E and F only

   [Option ID = 185]
2. B, D and F only

   [Option ID = 186]
3. A, C and F only

   [Option ID = 187]
4. A, C and E only

   [Option ID = 188]

48) Given below are two statements

Statement I: Chisel type tillage tools breakup the soil without inverting it

Statement II: Disc blades sharpened from the concave side penetrate more readily than disk blades sharpened from convex side

In light of the above statements, choose the *most appropriate* answer from the options given below

[Question ID = 48][Question Description = 148_31_AET_AUG22_Q48]

1. Both Statement I and Statement II are correct [Option ID = 189]
2. Both Statement I and Statement II are incorrect [Option ID = 190]
3. Statement I is correct but Statement II is incorrect [Option ID = 191]
4. Statement I is incorrect but Statement II is correct [Option ID = 192]

49) Consider the following statements for belt drive use in agricultural machinery

A. V-belts are employed in agricultural machinery applications in which it is not necessary to maintain exact speed ratios

B. V-belts are not suitable for heavy loads at low speeds

C. If the ratio between the tight side and slack side tension is too great, belt slippage will be excessive

D. Agricultural V-belts are designated based on Standard established by Rubber Manufacturers Association (RMA)

E. Belts designed specially for variable speed drives are narrower that conventional V-belts in relation to their thickness.

Choose the *correct* answer from the options given below:

[Question ID = 49][Question Description = 149_31_AET_AUG22_Q49]

1. A, C and E only [Option ID = 193]
2. B, C and D only [Option ID = 194]
3. A, B and C only [Option ID = 195]
4. B, C, D and E only [Option ID = 196]

50) Given below are two statements

Statement I: Weight transfer from drawbar pull, increases the soil reaction against front wheels and decreases the reaction against rear wheel.

Statement II: For towed wheel axle torque is zero and for self propelled wheel pull is zero.

In light of the above statements, choose the *most appropriate* answer from the options given below

[Question ID = 50][Question Description = 150_31_AET_AUG22_Q50]

1. Both Statement I and Statement II are correct [Option ID = 197]
2. Both Statement I and Statement II are incorrect [Option ID = 198]
3. Statement I is correct but Statement II is incorrect [Option ID = 199]
4. Statement I is incorrect but Statement II is correct [Option ID = 200]

51) Given below are two statements, one is labelled as Assertion A and the other is labelled as Reason R

Assertion A: The cylinder wall temperature of air-cooled engine is generally higher than that of water cooled engine

Reason R: The control of cylinder temperature is more difficult in air cooled engines

In light of the above statements, choose the *correct* answer from the options given below

[Question ID = 51][Question Description = 151_31_AET_AUG22_Q51]

1. Both **A** and **R** are true and **R** is the correct explanation of **A** [Option ID = 201]
2. Both **A** and **R** are true but **R** is NOT the correct explanation of **A** [Option ID = 202]
3. **A** is true but **R** is false [Option ID = 203]
4. **A** is false but **R** is true [Option ID = 204]

52) For the same compression ratio, the efficiency of diesel cycle approaches that of otto cycle as the Cut-off ratio approaches[Question ID = 52][Question Description = 152_31_AET_AUG22_Q52]

1. One [Option ID = 205]
2. Zero [Option ID = 206]
3. Infinity [Option ID = 207]
4. Ten [Option ID = 208]

53) As the compression ratio is decreased[Question ID = 53][Question Description = 153_31_AET_AUG22_Q53]

1. The exhaust temperature will decrease [Option ID = 209]
2. The exhaust temperarure will increase [Option ID = 210]
3. The exhaust temperature will not get affected [Option ID = 211]
4. The exhaust temperature will first increase and then decrease [Option ID = 212]

54) An agricultural worker expired 150 litres of air having 16% oxygen in 5 minute duration. What is the oxygen consumption in litre per minute to perform the activity?

[Question ID = 54][Question Description = 154_31_AET_AUG22_Q54]

1. 30. 0 [Option ID = 213]
2. 4.0 [Option ID = 214]
3. 3.0 [Option ID = 215]
4. 1.5 [Option ID = 216]

55) Which of the following conditions are essential for noise measurement of tractors and agricultural machinery as per IS (12180) 2000?

A. The measurement should be in A- weighted sound pressure level

B. The wind velocity at the microphone position shall not exceed 5 $m.s^{-1}$

C. Tractor shall be unballasted

D. The background noise shall be atleast 10 dB(A) below the level measured during test

E. The testing area should not have a slope of more than 15°

Choose the *correct* answer from the options given below:

[Question ID = 55][Question Description = 155_31_AET_AUG22_Q55]

1. A, B, C and D only

   [Option ID = 217]
2. B, C, D and E only

   [Option ID = 218]
3. A, C, D and E only

   [Option ID = 219]
4. A, B, D and E only

   [Option ID = 220]

56) Given below are two statements, one is labelled as Assertion A and the other is labelled as Reason R
Assertion A :The output gases from downdraft gasifier are relatively cleaner compared to gases from updraft gasifier

Reason R : In downdraft gasifier the products from the pyrolysis zone and drying zone pass through oxidation zone causing thermal cracking of volatiles

In light of the above statements, choose the *correct* answer from the options given below

[Question ID = 56][Question Description = 156_31_AET_AUG22_Q56]

1. Both **A** and **R** are true and **R** is the correct explanation of **A** [Option ID = 221]
2. Both **A** and **R** are true but **R** is NOT the correct explanation of **A** [Option ID = 222]
3. **A** is true but **R** is false [Option ID = 223]

4. **A** is false but **R** is true [Option ID = 224]

57) Given below are two statements

Statement I: In solar cell electromagnetic energy is converted into electricity while as in fuel cell chemical energy is converted into electricity

Statement II: In both solar cell and fuel cell conversion efficiency is limited by externally reversible heat engine cycle

In light of the above statements, choose the *most appropriate* answer from the options given below

[Question ID = 57][Question Description = 157_31_AET_AUG22_Q57]

1. Both Statement I and Statement II are correct

   [Option ID = 225]
2. Both Statement I and Statement II are incorrect

   [Option ID = 226]
3. Statement I is correct but Statement II is incorrect

   [Option ID = 227]
4. Statement I is incorrect but Statement II is correct

   [Option ID = 228]

58) What will be power generated from an arrangement having 200 solar cells connected in series. Assuming operating voltage of each photo-voltaic cell as 0.45 V and current output as 1.1A

[Question ID = 58][Question Description = 158_31_AET_AUG22_Q58]

1. 90W [Option ID = 229]
2. 99W [Option ID = 230]
3. 0.49W [Option ID = 231]
4. 220W [Option ID = 232]

59) Consider the following statements related to harvesting knife

A. Fine knife has small bevel angle

B. Blunt knife has large edge radius

C. Sharp knife has small edge radius

D. Dull knife has small bevel angle

Choose the *correct* answer from the options given below:

[Question ID = 59][Question Description = 159_31_AET_AUG22_Q59]

1. A and C only [Option ID = 233]
2. B and D only [Option ID = 234]
3. B and C only [Option ID = 235]
4. A, B, C and D [Option ID = 236]

60) Given below are two statements, one is labelled as Assertion A and the other is labelled as Reason R

Assertion A : In offset disc harrow the couple acting on front gang is considerably smaller than that of rear gang.

Reason R : In off-set disc harrow the rear gang is operating in loose soil compared to front gang.

In light of the above statements, choose the *correct* answer from the options given below

[Question ID = 60][Question Description = 160_31_AET_AUG22_Q60]

1. Both **A** and **R** are true and **R** is the correct explanation of **A** [Option ID = 237]
2. Both **A** and **R** are true but **R** is NOT the correct explanation of **A** [Option ID = 238]
3. **A** is true but **R** is false [Option ID = 239]
4. **A** is false but **R** is true [Option ID = 240]

61) Given below are two statements, one is labelled as Assertion A and the other is labelled as Reason R

Assertion A: Face-out type of arrangement in a barn saves 20% floor area as compared to face-in type.

Reason R: Manure alley can be eliminated in the face-in type of arrangement.

In light of the above statements, choose the *correct* answer from the options given below

[Question ID = 61][Question Description = 161_31_AET_AUG22_Q61]

1. Both **A** and **R** are true and **R** is the correct explanation of **A** [Option ID = 241]
2. Both **A** and **R** are true but **R** is NOT the correct explanation of **A** [Option ID = 242]
3. **A** is true but **R** is false [Option ID = 243]
4. **A** is false but **R** is true [Option ID = 244]

62) Efficiency of a spiral separator can be adjusted by

A. Feed rate

B. Air flow rate

C. Slope of spiral separator

D. Vibration frequency

E. Stroke length

Choose the *correct* answer from the options given below:

[Question ID = 62][Question Description = 162_31_AET_AUG22_Q62]

1. A only [Option ID = 245]
2. B and C only [Option ID = 246]
3. A and E only [Option ID = 247]
4. C and D only [Option ID = 248]

63) Drying of fruit pulp can be accomplished by which of the following dryer?

A. Fluidized bed dryer

B. Drum dryer

C. Spray dryer

D. LSU dryer

E. Baffle dryer

Choose the *correct* answer from the options given below:

[Question ID = 63][Question Description = 163_31_AET_AUG22_Q63]

1. A only [Option ID = 249]
2. B only [Option ID = 250]
3. B and C only [Option ID = 251]
4. D and E only [Option ID = 252]

64) Match List I with List II

List I	List II
A. Freeze dryer	I. Density
B. Specific gravity separator	II. Size reduction
C. Fick's law	III. Sublimation
D. Kick's law	IV. Diffusion

Choose the correct answer from the options given below:

[Question ID = 64][Question Description = 164_31_AET_AUG22_Q64]

1. A - I, B - III, C - IV, D - II [Option ID = 253]
2. A - III, B - I, C - II, D - IV [Option ID = 254]
3. A - III, B - I, C - IV, D - II [Option ID = 255]
4. A - I, B - III, C - II, D - IV [Option ID = 256]

65) Given below are two statements, one is labelled as Assertion A and the other is labelled as Reason R

Assertion A: CFTRI method of pulse milling eliminates use of edible oil.

Reason R: Alternate heating and tempering of pulses loosens the husk.

In light of the above statements, choose the *correct* answer from the options given below

[Question ID = 65][Question Description = 165_31_AET_AUG22_Q65]

1. Both **A** and **R** are true and **R** is the correct explanation of **A** [Option ID = 257]
2. Both **A** and **R** are true but **R** is NOT the correct explanation of **A** [Option ID = 258]
3. **A** is true but **R** is false [Option ID = 259]
4. **A** is false but **R** is true [Option ID = 260]

66) Food Safety and Standards Authority of India was established in the year

[Question ID = 66][Question Description = 166_31_AET_AUG22_Q66]

1. 2006 [Option ID = 261]
2. 2016 [Option ID = 262]
3. 2005 [Option ID = 263]
4. 2008 [Option ID = 264]

67) Purpose of a compressor in a vapour compression refrigeration system include(s)

A. To compress high pressure vapour coming from evaporator

B. Conversion of liquid refrigerant to vapour

C. To compress low pressure vapour refrigerant

D. To compress liquid refrigerant

E. Maintain pressure of liquid refrigerant

Choose the *correct* answer from the options given below:

[Question ID = 67][Question Description = 167_31_AET_AUG22_Q67]

1. A only [Option ID = 265]
2. A and E only [Option ID = 266]
3. C only [Option ID = 267]
4. C and D only [Option ID = 268]

68) The bulk density of the produce having porosity and true density of 40% and 50 $kg.m^{-3}$ will be

[Question ID = 68][Question Description = 168_31_AET_AUG22_Q68]

1. 20 $kg.m^{-3}$ [Option ID = 269]
2. 40 $kg.m^{-3}$ [Option ID = 270]
3. 80 $kg.m^{-3}$ [Option ID = 271]
4. 30 $kg.m^{-3}$ [Option ID = 272]

69) Decimal reduction time is the time required at a given condition to

[Question ID = 69][Question Description = 169_31_AET_AUG22_Q69]

1. Change the temperature of a process by 10°C [Option ID = 273]
2. Achieve one log reduction in relevant microorganism [Option ID = 274]
3. Change microbial inactivation rate by 90% [Option ID = 275]
4. Change microbial inactivation rate by 10% [Option ID = 276]

70) A multiple effect evaporator is one in which

A. Vapour from one effect is used directly as the heating medium in the next.

B. The pressure of vapour is increased and the resulting high pressure steam is re-used as a heating medium

C. Vapour is used to heat the incoming feed liquor or condensed vapour is used to raise steam in a boiler

D. Vapours from one effect is not utilized in heating

E. Vapours are condensed and condensed liquid is further heated

Choose the *correct* answer from the options given below:

[Question ID = 70][Question Description = 170_31_AET_AUG22_Q70]

1. A only [Option ID = 277]
2. A and B only [Option ID = 278]
3. B and C only [Option ID = 279]
4. D and E only [Option ID = 280]

71) Consider the following unit operations; arrange them in sequence as performed during wet milling of pulses

A. Conditioning

B. Mixing with red earth

C. Soaking

D. Dehusking

E. Grading

Choose the *correct* answer from the options given below

[Question ID = 71][Question Description = 171_31_AET_AUG22_Q71]

1. C, B, D, E, A [Option ID = 281]
2. C, B, A, D, E [Option ID = 282]
3. B, C, A, D, E [Option ID = 283]
4. C, A, B, D, E [Option ID = 284]

72) Given below are two statements, one is labelled as Assertion A and the other is labelled as Reason R

Assertion A: Per cent of moisture content expressed on dry basis can never be beyond 100%.

Reason R: On dry basis, moisture content of a sample is expressed with reference to total dry matter content of the sample.

In light of the above statements, choose the *correct* answer from the options given below

[Question ID = 72][Question Description = 172_31_AET_AUG22_Q72]

1. Both **A** and **R** are true and **R** is the correct explanation of **A** [Option ID = 285]
2. Both **A** and **R** are true but **R** is NOT the correct explanation of **A** [Option ID = 286]
3. **A** is true but **R** is false [Option ID = 287]
4. **A** is false but **R** is true [Option ID = 288]

73) If the lateral pressure at a certain height in a grain storage structure is calculated to be 2000 kg.m^{-2}; then the vertical pressure will be (given K = 0.5)

[Question ID = 73][Question Description = 173_31_AET_AUG22_Q73]

1. 1000 kg.m^{-2}

   [Option ID = 289]
2. 2000 kg.m^{-2}

   [Option ID = 290]
3. 4000 kg.m^{-2}

   [Option ID = 291]
4. 1500 kg.m^{-2}

   [Option ID = 292]

74) Airy's formula is used for calculation of lateral pressure in

A. CAP structure

B. Deep bins

C. Shallow bins

D. Pusa bins

E. Morai structure

Choose the *correct* answer from the options given below:

[Question ID = 74][Question Description = 174_31_AET_AUG22_Q74]

1. A only [Option ID = 293]
2. B only [Option ID = 294]
3. B and C only [Option ID = 295]
4. D and E only [Option ID = 296]

75) Given below are two statements, one is labelled as Assertion A and the other is labelled as Reason R

Assertion A: Velocity of air inside a suction hose conveying granular material will be higher than the terminal velocity of the material.

Reason R: Terminal velocity of a particle is equal to the air velocity at which a particle remains suspended in a column of air.

In light of the above statements, choose the *correct* answer from the options given below

[Question ID = 75][Question Description = 175_31_AET_AUG22_Q75]

1. Both **A** and **R** are true and **R** is the correct explanation of **A** [Option ID = 297]
2. Both **A** and **R** are true but **R** is NOT the correct explanation of **A** [Option ID = 298]
3. **A** is true but **R** is false [Option ID = 299]
4. **A** is false but **R** is true [Option ID = 300]

76) The process of parboiling is used for

A. Paddy

B. Millets

C. Oil seeds

D. Pulses

E. Sprouts

Choose the *correct* answer from the options given below:

[Question ID = 76][Question Description = 176_31_AET_AUG22_Q76]

1. A only [Option ID = 301]
2. A and B only [Option ID = 302]
3. C and E only [Option ID = 303]
4. A and D only [Option ID = 304]

77) Process of cooling or heating of air without changing the humidity ratio is represented on a psychrometric chart by[Question ID = 77][Question Description = 177_31_AET_AUG22_Q77]

1. Vertical line [Option ID = 305]
2. Horizontal line [Option ID = 306]
3. Curved line [Option ID = 307]
4. Inclined line [Option ID = 308]

78) Bulgur is a product of

[Question ID = 78][Question Description = 178_31_AET_AUG22_Q78]

1. Rice [Option ID = 309]
2. Maize [Option ID = 310]
3. Soybean [Option ID = 311]
4. Wheat [Option ID = 312]

79) The efficiency of a screen cleaner can be increased by

A. Reducing the screen size

B. Increasing the feed rate keeping all other factors constant

C. Uniformly spreading the material over the full width of screen

D. Keeping grain depth equal to twice that of particle size

E. Increasing the screen size

Choose the *correct* answer from the options given below:

[Question ID = 79][Question Description = 179_31_AET_AUG22_Q79]

1. E only

   [Option ID = 313]
2. A and B only

   [Option ID = 314]
3. C and E only

   [Option ID = 315]
4. B and D only

   [Option ID = 316]

80) Which among the following equipment separate the material based on specific gravity?

A. Specific gravity separator

B. Inclined draper

C. Stone separator

D. Screen cleaner

E. Indented cylinder

Choose the *correct* answer from the options given below:

[Question ID = 80][Question Description = 180_31_AET_AUG22_Q80]

1. A only [Option ID = 317]
2. A and C only [Option ID = 318]
3. B and D only [Option ID = 319]
4. C and E only [Option ID = 320]

81) Match List I with List II

List I	List II
A. Liquid nitrogen	I. Milk
B. Ethylene	II. Grains
C. Phosphine	III. Freezing
D. Spray dryer	IV. Fruits

Choose the correct answer from the options given below:

[Question ID = 81][Question Description = 181_31_AET_AUG22_Q81]

1. A - III, B - IV, C - II, D - I [Option ID = 321]
2. A - III, B - IV, C - I, D - II [Option ID = 322]
3. A - IV, B - III, C - II, D - I [Option ID = 323]
4. A - IV, B - III, C - I, D - II [Option ID = 324]

82) One ton of litchi was cooled from 35°C to 5°C using a 5 ton refrigeration system in 3 hours. The amount of heat removed by the refrigeration system will be (given specific heat of litchi = 0.5 kcal/kg.°C)[Question ID = 82][Question Description = 182_31_AET_AUG22_Q82]

1. 15000 kcal [Option ID = 325]
2. 30000 kcal [Option ID = 326]
3. 15 kcal [Option ID = 327]
4. 3000 kcal [Option ID = 328]

83) In a belt conveyor, drive unit is coupled

[Question ID = 83][Question Description = 183_31_AET_AUG22_Q83]

1. Midway of loading and unloading point [Option ID = 329]
2. At loading end of the belt [Option ID = 330]
3. Along the length of the belt [Option ID = 331]
4. At discharge end of the belt [Option ID = 332]

84) Given below are two statements, one is labelled as Assertion A and the other is labelled as Reason R
Assertion A : The conical shell of a ball mill is operated at a speed slightly higher than the critical speed.

Reason R : Critical speed of a ball is that rotational speed at which centrifuging occurs.

In light of the above statements, choose the *correct* answer from the options given below

[Question ID = 84][Question Description = 184_31_AET_AUG22_Q84]

1. Both **A** and **R** are true and **R** is the correct explanation of **A** [Option ID = 333]
2. Both **A** and **R** are true but **R** is NOT the correct explanation of **A** [Option ID = 334]
3. **A** is true but **R** is false [Option ID = 335]
4. **A** is false but **R** is true [Option ID = 336]

85) Recirculatory batch dryer is a

[Question ID = 85][Question Description = 185_31_AET_AUG22_Q85]

1. Modification of kiln dryer [Option ID = 337]
2. Deep bed dryer [Option ID = 338]
3. Continuous flow non mixing type of dryer [Option ID = 339]
4. Continuous mixing type of dryer [Option ID = 340]

86) Winterization of crude oil is a refining step during which

A. Oil is processed with activated carbon

B. Bleached oil is cooled to a low temperature for a long period

C. Solid materials are filtered

D. Oil is washed with water

E. Soaps are removed from the oil by centrifugation

Choose the *correct* answer from the options given below:

[Question ID = 86][Question Description = 186_31_AET_AUG22_Q86]

1. A only [Option ID = 341]
2. B only [Option ID = 342]
3. B and C only [Option ID = 343]
4. D and E only [Option ID = 344]

87) Given below are two statements, one is labelled as Assertion A and the other is labelled as Reason R

Assertion A: Passive MAP is a packaging technique in which desired gas composition is achieved over a period of time.

Reason R: Respiration of the produce packed in a selective permeable package changes the gas composition in the package.

In light of the above statements, choose the *correct* answer from the options given below

[Question ID = 87][Question Description = 187_31_AET_AUG22_Q87]

1. Both **A** and **R** are true and **R** is the correct explanation of **A** [Option ID = 345]
2. Both **A** and **R** are true but **R** is NOT the correct explanation of **A** [Option ID = 346]
3. **A** is true but **R** is false [Option ID = 347]
4. **A** is false but **R** is true [Option ID = 348]

88) If the moisture content of a sample on dry basis is 100%; the moisture content expressed on wet basis will be

[Question ID = 88][Question Description = 188_31_AET_AUG22_Q88]

1. 25% [Option ID = 349]
2. 50% [Option ID = 350]
3. 75% [Option ID = 351]
4. 125% [Option ID = 352]

89) Bagasse is a byproduct of

[Question ID = 89][Question Description = 189_31_AET_AUG22_Q89]

1. Raw groundnut processing [Option ID = 353]
2. Soybean processing [Option ID = 354]
3. Wet milling of wheat [Option ID = 355]
4. Sugarcane processing [Option ID = 356]

90) The process of exposing food and food package to ionizing radiation is known as

A. Irradiation

B. Infrared processing

C. Ohmic processing

D. Ultraviolet processing

E. Exposure processing

Choose the *correct* answer from the options given below:

[Question ID = 90][Question Description = 190_31_AET_AUG22_Q90]

1. A only [Option ID = 357]
2. A and B only [Option ID = 358]
3. A and D only [Option ID = 359]
4. C and E only [Option ID = 360]

91) The dimensions of Manning's coefficient is

[Question ID = 91][Question Description = 191_31_AET_AUG22_Q91]

1. $L^{-1/3}$ T [Option ID = 361]
2. $L^{-2/3}$ T [Option ID = 362]
3. $L^{1/3}$ T [Option ID = 363]
4. L $T^{1/3}$ [Option ID = 364]

92) The maximum permissible velocity of water in the clayey Channels is

[Question ID = 92][Question Description = 192_31_AET_AUG22_Q92]

1. 0.45 $m.s^{-1}$ [Option ID = 365]
2. 0.60 $m.s^{-1}$ [Option ID = 366]
3. 0.70 $m.s^{-1}$ [Option ID = 367]

4. 0.65 $m.s^{-1}$ [Option ID = 368]

93) Given below are two statements:

Statement-I: For the most economical section of a rectangular channel giving maximum discharge would be when the flow depth is half the breadth of the channel.

Statement-II: For the most economical section of a rectangular channel giving maximum discharge would be when the hydraulic mean radius of the channel is half the depth of flow.

In light of the above statements, choose the *most appropriate* answer from the options given below

[Question ID = 93][Question Description = 193_31_AET_AUG22_Q93]
1. Both Statement I and Statement II are correct [Option ID = 369]
2. Both Statement I and Statement II are incorrect [Option ID = 370]
3. Statement I is correct but Statement II is incorrect [Option ID = 371]
4. Statement I is incorrect but Statement II is correct [Option ID = 372]

94) Given below are two statements

Statement I: Water storage efficiency states that small irrigation may lead to higher water application efficiencies yet the irrigation practice may be poor.

Statement II: Permissible length of irrigation runs are controlled to a large extent by the uniformity of water distribution which is possible for a given soil and irrigation management practice.

In light of the above statements, choose the *correct* answer from the options given below

[Question ID = 94][Question Description = 194_31_AET_AUG22_Q94]
1. Both Statement I and Statement II are true [Option ID = 373]
2. Both Statement I and Statement II are false [Option ID = 374]
3. Statement I is true but Statement II is false [Option ID = 375]
4. Statement I is false but Statement II is true [Option ID = 376]

95) Given below are two statements:

Statement- I : Irrigation frequency indicates the number of days between irrigations during periods of without rainfall.

Statement- II : Irrigation frequency depends on the consumptive use rate of a crop and the amount of unavailable moisture in the crop root zone.

In light of the above statements, choose the *most appropriate* answer from the options given below

[Question ID = 95][Question Description = 195_31_AET_AUG22_Q95]
1. Both Statement I and Statement II are correct [Option ID = 377]
2. Both Statement I and Statement II are incorrect [Option ID = 378]
3. Statement I is correct but Statement II is incorrect [Option ID = 379]
4. Statement I is incorrect but Statement II is correct [Option ID = 380]

96) The relationship between irrigation period (IP) and irrigation frequency (IF) for a well designed irrigation system will be

[Question ID = 96][Question Description = 196_31_AET_AUG22_Q96]
1. IP < IF

   [Option ID = 381]
2. IP > IF

   [Option ID = 382]
3. IP = IF

   [Option ID = 383]
4. IP ≤ IF

   [Option ID = 384]

97) Which stage of rice plant consumes more water?[Question ID = 97][Question Description = 197_31_AET_AUG22_Q97]
1. Initial [Option ID = 385]
2. Crop development [Option ID = 386]
3. Mid season [Option ID = 387]
4. Late season [Option ID = 388]

98) Resistance to uniform turbulent flow in an open channel system is often expressed in terms of the resistance co-efficient using

A. Manning's equation

B. Chezy's equation

C. Darcy -Weisbach equation

D. Bernoulli's equation

E. Francis Formula

Choose the *correct* answer from the options given below:

[Question ID = 98][Question Description = 198_31_AET_AUG22_Q98]

1. A, B and D only [Option ID = 389]
2. A, B and C only [Option ID = 390]
3. B, D and E only [Option ID = 391]
4. C, D and E only [Option ID = 392]

99) A Persian wheel discharges water at the rate of 11,000 lph and works for 8 hours each day. Estimate the area commanded by the water lift if the average depth of irrigation is 8 cm and irrigation interval is 15 days.

[Question ID = 99][Question Description = 199_31_AET_AUG22_Q99]

1. 1.5 ha [Option ID = 393]
2. 2.0 ha [Option ID = 394]
3. 1.65 ha [Option ID = 395]
4. 1.75 ha [Option ID = 396]

100) Given below are two statements

Statement I: Vegetative methods, berms and riprap are the methods used for controlling erosion by waves.

Statement II: Riprap consists of loose stones or concrete blocks dumped or hand placed on the side of the embankment not facing the water.

In light of the above statements, choose the *most appropriate* answer from the options given below

[Question ID = 100][Question Description = 200_31_AET_AUG22_Q100]

1. Both Statement I and Statement II are correct [Option ID = 397]
2. Both Statement I and Statement II are incorrect [Option ID = 398]
3. Statement I is correct but Statement II is incorrect [Option ID = 399]
4. Statement I is incorrect but Statement II is correct [Option ID = 400]

101) Given below are two statements

Statement I: Free board is the additional height of the dam provided as a safety factor to prevent overtopping due to unexpected runoff or by wave action.

Statement II: Free board is the vertical distance between the designed water elevation and the elevation of the top of the dam before settlement.

In light of the above statements, choose the *most appropriate* answer from the options given below

[Question ID = 101][Question Description = 201_31_AET_AUG22_Q101]

1. Both Statement I and Statement II are correct [Option ID = 401]
2. Both Statement I and Statement II are incorrect [Option ID = 402]
3. Statement I is correct but Statement II is incorrect [Option ID = 403]
4. Statement I is incorrect but Statement II is correct [Option ID = 404]

102) The Peak rate of runoff expected from the catchment area of a farm pond is 4 m^3s^{-1}. Assuming no temporary storage, find the length of the surplus weir, if the depth of flow over the weir is not to exceed 0.75 m.

[Question ID = 102][Question Description = 202_31_AET_AUG22_Q102]

1. 2.5 m

   [Option ID = 405]
2. 3.0 m

   [Option ID = 406]
3. 3.5 m

   [Option ID = 407]
4. 3.7 m

   [Option ID = 408]

103) Which land capability classes are divided into sub classes for agriculture use on the basis of

I. risk of erosion or post erosion damage

II. wetness

III. damage or overflow

IV. root zone limitation

V. climatic limitation

[Question ID = 103][Question Description = 203_31_AET_AUG22_Q103]

1. I, II, IV

   [Option ID = 409]
2. III, IV, V

   [Option ID = 410]
3. II, III, IV

   [Option ID = 411]
4. I, II, III

   [Option ID = 412]

104) Match List I with List II

List I	List II
A. Apron thickness	I. Earth pressure
B. Side walls	II. Contact pressure
C. Foundation	III. Hydrostatic pressure
D. Head wall	IV. Uplift pressure

Choose the correct answer from the options given below:

[Question ID = 104][Question Description = 204_31_AET_AUG22_Q104]

1. A - IV, B - I , C - II , D - III [Option ID = 413]
2. A - I , B - IV , C - II , D - III [Option ID = 414]
3. A -III , B - II , C - I , D - IV [Option ID = 415]
4. A - IV , B - II , C - III , D - I [Option ID = 416]

105) Match List I with List II

List I	List II
A. Blaney-Criddle method	I. Revised wind function term
B. Radiation method	II. Integrated effect of radiation, wind, temperature, humidity
C. Modified Penman method	III. Day length related factor
D. Pan evaporation method	IV. Ratio of actual to maximum possible sunshine hours

Choose the correct answer from the options given below:

[Question ID = 105][Question Description = 205_31_AET_AUG22_Q105]

1. A -III , B - IV , C - I , D - II [Option ID = 417]
2. A - IV , B - I , C - II , D - III [Option ID = 418]
3. A - I , B - II , C - III , D - IV [Option ID = 419]
4. A -II , B - III , C - IV , D - I [Option ID = 420]

106) Which of the following statements regarding confined aquifers are correct?

A. They are called as leaky aquifers

B. They do not receive significant amount of recharge from overlying surface

C. Water present is at a pressure greater than the atmospheric pressure

Choose the *correct* answer from the options given below:

[Question ID = 106][Question Description = 206_31_AET_AUG22_Q106]

1. B and C only [Option ID = 421]
2. A and C only [Option ID = 422]
3. A and B only [Option ID = 423]
4. Only C [Option ID = 424]

107) Match List I with List II

List I	List II
Groundwater Investigation method	Characteristic
A. Electrical resistivity	I. Covers large and inaccessible area within short time
B. Well logging	II. Applied to a relatively limited extent for groundwater investigations
C. Seismic	III. Most commonly used method
D. Remote sensing	IV. Provides reliable information about subsurface conditions

Choose the correct answer from the options given below:

[Question ID = 107][Question Description = 207_31_AET_AUG22_Q107]

1. A - IV, B - III, C - II, D - I

   [Option ID = 425]
2. A - III, B - IV, C - I, D - II

   [Option ID = 426]
3. A - III, B - IV, C - II, D - I

   [Option ID = 427]
4. A - IV, B - I, C - II, D - III

   [Option ID = 428]

108) Which state is having largest area under salt affected soils ?[Question ID = 108][Question Description = 208_31_AET_AUG22_Q108]

1. Rajasthan [Option ID = 429]
2. Gujarat [Option ID = 430]
3. Uttar Pradesh [Option ID = 431]
4. Maharashtra [Option ID = 432]

109) Which of the following statements regarding the drainage system are correct ?

A. It maintains favourable salt and air environments in the crop root zone

B. It does not promote beneficial soil bacteria activity

C. It allows for timelier field operations

D. Crop yields are increased because of improved water management and uptake of plant nutrients

E. There is more surface runoff and soil erosion on drained land

Choose the *correct* answer from the options given below:

[Question ID = 109][Question Description = 209_31_AET_AUG22_Q109]

1. A, B and D only [Option ID = 433]
2. A, C and D only [Option ID = 434]
3. A, B, C and D only [Option ID = 435]
4. A and E only [Option ID = 436]

110) The normal annual rainfall of the stations A, B, C and D in a basin are 75, 80, 96 and 72 cm, respectively. In the year 2020, the station A was inoperative and th stations B, C and D recorded annual precipitations of 70, 72 and 63 cm, respectively. Estimate the rainfall at station D in that year.

[Question ID = 110][Question Description = 210_31_AET_AUG22_Q110]

1. 50 cm [Option ID = 437]
2. 55 cm [Option ID = 438]
3. 60 cm [Option ID = 439]
4. 62.5 cm [Option ID = 440]

111) Given below are two statements regarding curve number method of runoff estimation

Statement I: Curve number method is also known as the Hydrologic Soil Cover Complex Method

Statement II: Curve number method is based on the recharge capacity of the watershed

In light of the above statements, choose the *correct* answer from the options given below

[Question ID = 111][Question Description = 211_31_AET_AUG22_Q111]

1. Both Statement I and Statement II are true [Option ID = 441]
2. Both Statement I and Statement II are false [Option ID = 442]
3. Statement I is true but Statement II is false [Option ID = 443]

4. Statement I is false but Statement II is true [Option ID = 444]

112) Effluent from drainage system with 8 dSm^{-1} EC is discharged in a canal water having 0.3 dS m^{-1} EC. If discharge of drainage effluent and canal water is 30 and 900 m^3 h^{-1}, respectively then what will be EC of downstream canal water?

[Question ID = 112][Question Description = 212_31_AET_AUG22_Q112]

1. 4.15 dS m^{-1} [Option ID = 445]
2. 0.55 dS m^{-1} [Option ID = 446]
3. 0.3 dS m^{-1} [Option ID = 447]
4. 1.55 dS m^{-1} [Option ID = 448]

113) Match List I with List II

List I	List II
Drainage layout	Characteristics
A. Random	I. Main line and submain laid in low area and lateral are drawn from both sides
B. Herring bone	II. Drains placed at the upper edge of wetted area to intercept the subsurface seepage
C. Grid Iron	III. For draining isolated patches when entire areas does not require drainage
D. Cut off	IV. Laterals enter the main line only from one side

Choose the correct answer from the options given below:

[Question ID = 113][Question Description = 213_31_AET_AUG22_Q113]

1. A - III, B - IV, C - I, D - II

   [Option ID = 449]
2. A - II, B - IV, C - I, D - III

   [Option ID = 450]
3. A - IV, B - III, C - I, D - II

   [Option ID = 451]
4. A - III, B - I, C - IV, D - II

   [Option ID = 452]

114) Which of the following statements regarding artificial gravel pack are correct?

A. It is required when the aquifer material is homogeneous with a uniformity coefficient (Cu) of less than 3 and an effective grain size (D10) of less than 0.25 mm

B. It stabilizes the aquifer tapped by the well

C. It provides a zone of high permeability surrounding the well screen

D. It decreases the well radius (known as 'effective radius' of the well) and well yield

E. The maximum grain size of a gravel pack should be less than 1 cm

Choose the *correct* answer from the options given below:

[Question ID = 114][Question Description = 214_31_AET_AUG22_Q114]

1. A, B, C and E only [Option ID = 453]
2. B and C only [Option ID = 454]
3. B, C and E only [Option ID = 455]
4. B, C and D only [Option ID = 456]

115) Which of the following statements regarding land levelling methods are correct

A. Plane method is most commonly used method of land levelling

B. Profile method is usually well adopted to leveling design of very flat land with undulating topography

C. Plan inspection method does not give quick estimate

D. Contour method is adapted to smoothening of steep lands that are to be irrigated

Choose the *correct* answer from the options given below:

[Question ID = 115][Question Description = 215_31_AET_AUG22_Q115]

1. A, B and D only [Option ID = 457]
2. A, B and C only [Option ID = 458]
3. B, C and D only [Option ID = 459]
4. B and D only [Option ID = 460]

116) Read the following statements regarding Theodolite

Statement I: It can measure both horizontal and Vertical angles

Statement II: Plumb bob is used for centering of theodolite

In light of the above statements, choose the *correct* answer from the options given below

[Question ID = 116][Question Description = 216_31_AET_AUG22_Q116]

1. Both Statement I and Statement II are true [Option ID = 461]
2. Both Statement I and Statement II are false [Option ID = 462]
3. Statement I is true but Statement II is false [Option ID = 463]
4. Statement I is false but Statement II is true [Option ID = 464]

117) Which of the following statements regarding well discharge are true?

A. It increases with drawdown

B. It increases with well diameter

C. It is affected by diameter but not drawdown

D. It decreases with drawdown

Choose the *correct* answer from the options given below:

[Question ID = 117][Question Description = 217_31_AET_AUG22_Q117]

1. C only

   [Option ID = 465]
2. A and B only

   [Option ID = 466]
3. B and D only

   [Option ID = 467]
4. B and C only

   [Option ID = 468]

118) A pump lifts 72,000 litres of water per hour against a total head of 19 meters. Compute the water horse power.

[Question ID = 118][Question Description = 218_31_AET_AUG22_Q118]

1. 10 hp

   [Option ID = 469]
2. 5 hp

   [Option ID = 470]
3. 19 hp

   [Option ID = 471]
4. 7.5 hp

   [Option ID = 472]

119) Match List I with List II

List I	List II
Canal Water Terminology	Definition
A. Duty of water	I. Total depth of irrigation to a crop
B. Irrigation intensity	II. Days for which water is supplied to a crop
C. Base period	III. Ratio between irrigated area and quantity of water used
D. Delta	IV. Ratio of operating period of the distributory to the total period of the crop
	V. Actual area irrigated in a year from an outlet

Choose the correct answer from the options given below:

[Question ID = 119][Question Description = 219_31_AET_AUG22_Q119]

1. A - III, B - IV, C - II, D - I

   [Option ID = 473]
2. A - III, B - V, C - IV, D - II

   [Option ID = 474]

3. A - IV, B - V, C - II, D - I

   [Option ID = 475]
4. A - III, B - V, C - II, D - I

   [Option ID = 476]

120) A 100 m tape is held 1 m out of line. What is the true length of tape?

[Question ID = 120][Question Description = 220_31_AET_AUG22_Q120]

1. 99.990 [Option ID = 477]
2. 99.998 [Option ID = 478]
3. 99.995 [Option ID = 479]
4. 99.992 [Option ID = 480]