

42 Renewable Energy Engineering ICAR SEPT 2022

Topic:- GEN KNOW COMMON PHD

1) Colour of the tag used on certified seed bags is[Question ID = 16958][Question Description = 101_221_GKD_SEP22_Q01]

1. Blue [Option ID = 37829]
2. Purple [Option ID = 37830]
3. White [Option ID = 37831]
4. Golden Yellow [Option ID = 37832]

2) Following are the statements regarding the Usar soil -

- A. It is reclaimed by adding lime.
- B. This soil has pH more than seven.
- C. Paddy crop can be grown in this soil.

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

[Question ID = 16959][Question Description = 102_221_GKD_SEP22_Q02]

1. A and B only [Option ID = 37833]
2. B and C only [Option ID = 37834]
3. C only [Option ID = 37835]
4. A only [Option ID = 37836]

3) When total utility of a commodity increases, marginal utility will be

[Question ID = 16960][Question Description = 103_221_GKD_SEP22_Q03]

1. Negative but increasing
[Option ID = 37837]
2. Positive but decreasing
[Option ID = 37838]
3. Constant
[Option ID = 37839]
4. Either positive or negative
[Option ID = 37840]

4) Where is the headquarter of International Fund for Agriculture Development located?

[Question ID = 16961][Question Description = 104_221_GKD_SEP22_Q04]

1. Vienna, Austria
[Option ID = 37841]
2. Rome, Italy
[Option ID = 37842]
3. New York, USA
[Option ID = 37843]
4. Berlin, Germany
[Option ID = 37844]

5) Mid-Oceanic Ridges are one of the important divisions of the ocean floor. In this respect, point out the incorrect statement regarding the 'Mid-Oceanic Ridges'. [Question ID = 16962][Question Description = 105_221_GKD_SEP22_Q05]

1. It is the largest mountain chain on the surface of the earth [Option ID = 37845]
2. It is a series of interconnected chain within the ocean. [Option ID = 37846]
3. It is characterised by a central rift system [Option ID = 37847]
4. The rift system at the crest is the zone of very low volcanic activity. [Option ID = 37848]

6) Consider the following facts about the union territory of India and point out the one which is incorrect in relation to union territory.[Question ID = 16963][Question Description = 106_221_GKD_SEP22_Q06]

1. These are the areas under the direct control of central government. [Option ID = 37849]
2. Also known as the 'centrally administered territories. [Option ID = 37850]

3. These territories constitute a conspicuous departure from the unitary feature of India. [Option ID = 37851]
4. There is no uniformity in their administrative systems. [Option ID = 37852]

7) Variety of flora and fauna are found in the different types of forest in India. In this regard, species of trees like teak, *sal shisham*, *sandalwood*, etc. are found in which of the following type of forests in India?[Question ID = 16964][Question Description = 107_221_GKD_SEP22_Q07]

1. Tropical evergreen forests [Option ID = 37853]
2. Tropical thorn forests [Option ID = 37854]
3. Tropical deciduous forests [Option ID = 37855]
4. Montane forests [Option ID = 37856]

8) The Marginal Preference Theory of consumption behaviour was proposed by

[Question ID = 16965][Question Description = 108_221_GKD_SEP22_Q08]

1. Armstrong
[Option ID = 37857]
2. J.K.Hicks
[Option ID = 37858]
3. Neumann
[Option ID = 37859]
4. Edmund Cannon
[Option ID = 37860]

9) Point out the incorrect statements regarding the service sector in India.[Question ID = 16966][Question Description = 109_221_GKD_SEP22_Q09]

1. It is the highest contributor to GDP [Option ID = 37861]
2. It requires skilled labour [Option ID = 37862]
3. It is the fastest growing sector [Option ID = 37863]
4. It is restricted to very few sectors. [Option ID = 37864]

10) Consider the statements regarding the agriculture sector in India and point out the incorrect statement.[Question ID = 16967][Question Description = 110_221_GKD_SEP22_Q10]

1. Agriculture sector is the largest employer of workforce [Option ID = 37865]
2. It has contributed to the Gross Value Added (GVA) [Option ID = 37866]
3. Growth in allied sectors is the major drivers of overall growth in the sector. [Option ID = 37867]
4. Minimum Support Price (MSP) policy is used as to promote crop uniformity. [Option ID = 37868]

11) In case of related goods, the cross elasticity of demand is[Question ID = 16968][Question Description = 111_221_GKD_SEP22_Q11]

1. Low [Option ID = 37869]
2. High [Option ID = 37870]
3. Zero [Option ID = 37871]
4. Unity [Option ID = 37872]

12) With reference to organic farming in India, consider the following statements :

- A. The National Programme for Organic Production' (NPOP) is operated under the guidelines and directions of the Union Ministry of Rural Development.
- B. The Agricultural and Processed Food Products Export Development Authority' (APEDA) functions as the Secretariat for the implementation of NPOP.
- C. Sikkim has become India's first fully organic state.

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

[Question ID = 16969][Question Description = 112_221_GKD_SEP22_Q12]

1. A and B only
[Option ID = 37873]
2. B and C only
[Option ID = 37874]
3. C only
[Option ID = 37875]
4. A, B and C

[Option ID = 37876]

13) With reference to the circumstances in Indian agriculture, the concept of "Conservation Agriculture" assumes significance. Which of the following falls under the Conservation Agriculture ?

- A. Avoiding the monoculture practices.
- B. Adopting minimum tillage.
- C. Avoiding the cultivation of plantation crops.
- D. Using crop residues to cover soil surface.
- E. Adopting spatial and temporal crop sequencing/ crop rotations.

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

[Question ID = 16970][Question Description = 113_221_GKD_SEP22_Q13]

- 1. A, C and D only [Option ID = 37877]
- 2. B, C, D and E only [Option ID = 37878]
- 3. B, D and E only [Option ID = 37879]
- 4. A, B, C and E only [Option ID = 37880]

14) Consumers are likely to get a variety of goods in which kind of market competition[Question ID = 16971][Question Description = 114_221_GKD_SEP22_Q14]

- 1. Monopoly [Option ID = 37881]
- 2. Duopoly [Option ID = 37882]
- 3. Oligopoly [Option ID = 37883]
- 4. Monopolistic [Option ID = 37884]

15) What is the correct chronological order of the following laws enacted for the conservation and protection of environment ?

- A. Environment (Protection) Act.
- B. Water (Prevention & Control of Pollution) Act.
- C. Air (Prevention & Control of pollution) Act.
- D. National Green Tribunal Act.

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

[Question ID = 16972][Question Description = 115_221_GKD_SEP22_Q15]

- 1. B, C, A, D [Option ID = 37885]
- 2. A, B, C, D [Option ID = 37886]
- 3. C, B, A, D [Option ID = 37887]
- 4. D, C, B, A [Option ID = 37888]

16) The scientific study of soil is[Question ID = 16973][Question Description = 116_221_GKD_SEP22_Q16]

- 1. Earth Study [Option ID = 37889]
- 2. Soil Science [Option ID = 37890]
- 3. Pedology [Option ID = 37891]
- 4. Soil Chemistry [Option ID = 37892]

17) *Triticum aestivum*, the common bread wheat is -

[Question ID = 16974][Question Description = 117_221_GKD_SEP22_Q17]

- 1. Tetraploid
[Option ID = 37893]
- 2. Hexaploid
[Option ID = 37894]
- 3. Haploid
[Option ID = 37895]
- 4. Diploid
[Option ID = 37896]

18) Sectoral inflation refers to[Question ID = 16975][Question Description = 118_221_GKD_SEP22_Q18]

- 1. Running inflation [Option ID = 37897]

2. Comprehensive inflation [Option ID = 37898]
3. Sporadic inflation [Option ID = 37899]
4. Creeping inflation [Option ID = 37900]

19) Keynes Liquidity trap refers to[Question ID = 16976][Question Description = 119_221_GKD_SEP22_Q19]

1. Speculative demand for money [Option ID = 37901]
2. Transactions motive of money is inelastic [Option ID = 37902]
3. Precautionary motive of money is inelastic [Option ID = 37903]
4. Transactions motive of money is constant [Option ID = 37904]

20) A business is solvent if[Question ID = 16977][Question Description = 120_221_GKD_SEP22_Q20]

1. Total receipts exceed total expenditures [Option ID = 37905]
2. Total debt exceeds total equity [Option ID = 37906]
3. Total sales exceed total cash expense [Option ID = 37907]
4. Total assets exceed total liabilities [Option ID = 37908]

Topic:- Agricultural Engg and Tech_PHD

1) The major objectives of secondary tillage operations are:

- A. to pulverize soil
- B. to reduce strength and compactness of soil
- C. to destroy grasses and weeds
- D. to make the field surface level

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

[Question ID = 4751][Question Description = 101_63_PBF_SEP22_Q01]

1. A, B and C only [Option ID = 19001]
2. B, C and D only [Option ID = 19002]
3. A, C and D only [Option ID = 19003]
4. A, B and D only [Option ID = 19004]

2) The loamy soil with silt as the dominant particle is known as medium soil. The particle size of silt (mm) is:

[Question ID = 4752][Question Description = 102_63_PBF_SEP22_Q02]

1. <0.002
[Option ID = 19005]
2. 0.002-0.05
[Option ID = 19006]
3. 0.05-0.1
[Option ID = 19007]
4. 0.1-0.25
[Option ID = 19008]

3) Which of the following statements are true for precision planting?

- A. Greater crop uniformity
- B. Better yield
- C. Higher income per unit area

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

[Question ID = 4753][Question Description = 103_63_PBF_SEP22_Q03]

1. A, B only [Option ID = 19009]
2. B, C only [Option ID = 19010]
3. A, C only [Option ID = 19011]
4. A, B, C [Option ID = 19012]

4) In order to reduce the speed of seed in furrows, the seed tube is inclined rear ward from the vertical at:[Question ID = 4754][Question Description = 104_63_PBF_SEP22_Q04]

1. 15° - 20° [Option ID = 19013]
2. 25° - 30° [Option ID = 19014]
3. 30° - 45° [Option ID = 19015]

4. 45° - 60° [Option ID = 19016]

5) The outer tip of sweep wing has ground clearance of:[Question ID = 4755][Question Description = 105_63_PBF_SEP22_Q05]

1. 3 - 7 mm [Option ID = 19017]
2. 10 - 15 mm [Option ID = 19018]
3. 15 - 20 mm [Option ID = 19019]
4. 20 - 25 mm [Option ID = 19020]

6) Given below are two statements

Statement I: The tractor operated mist sprayer applies the same quantity of chemical in one- tenth volume compared to a hydraulic sprayer.

Statement II: In electrostatic spayer the amount of spray material reaching the plant increases significantly due to air assistance only.

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

[Question ID = 4756][Question Description = 106_63_PBF_SEP22_Q06]

1. Both Statement I and Statement II are correct [Option ID = 19021]
2. Both Statement I and Statement II are incorrect [Option ID = 19022]
3. Statement I is correct but Statement II is incorrect [Option ID = 19023]
4. Statement I is incorrect but Statement II is correct [Option ID = 19024]

7) Following types of knife sections are used in a standard cutter bar

- A. Smooth edge type
- B. Top serrated type
- C. Under serrated type

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

[Question ID = 4757][Question Description = 107_63_PBF_SEP22_Q07]

1. A only [Option ID = 19025]
2. A and B only [Option ID = 19026]
3. A and C only [Option ID = 19027]
4. A, B and C only [Option ID = 19028]

8) Which is NOT a type of thresher?

[Question ID = 4758][Question Description = 108_63_PBF_SEP22_Q08]

1. Drum type [Option ID = 19029]
2. Syndicator type [Option ID = 19030]
3. Beater type [Option ID = 19031]
4. Flail type [Option ID = 19032]

9) Determine the percentage increase in linear speed of a mower, without change in crank wheel speed, having drive wheel diameter of 420 mm. The mower is being operated by a 35 hp tractor at a forward speed of 3.52 km.h⁻¹ and the crank wheel makes a rotation of 960 RPM. The change in speed ratio between the crank wheel and drive wheel is 24:1.

[Question ID = 4759][Question Description = 109_63_PBF_SEP22_Q09]

1. 10 [Option ID = 19033]
2. 12 [Option ID = 19034]
3. 14 [Option ID = 19035]
4. 15 [Option ID = 19036]

10) Length of chain conveyor in elevator type potato digger is normally kept in the range of:[Question ID = 4760][Question Description = 110_63_PBF_SEP22_Q10]

1. 1.50 - 1.80 mm [Option ID = 19037]
2. 1.20 - 1.50 mm [Option ID = 19038]
3. 1.00 - 1.20 mm [Option ID = 19039]
4. 0.80 - 1.00 mm [Option ID = 19040]

11) When the wheel steer angle decreased with increasing speed, the under steer coefficient is:[Question ID = 4761][Question Description = 111_63_PBF_SEP22_Q11]

1. Zero [Option ID = 19041]
2. Positive [Option ID = 19042]
3. Negative [Option ID = 19043]

4. Neutral [Option ID = 19044]

12) Given below are two statements

Statement I: OSHA standard permits exposure of 85dB(A) for a 16 hour work period

Statement II: As per NIOSH standard, for every 5dB increase in noise, the allowable exposure time is reduced to half

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

[Question ID = 4762][Question Description = 112_63_PBF_SEP22_Q12]

1. Both Statement I and Statement II are true [Option ID = 19045]
2. Both Statement I and Statement II are false [Option ID = 19046]
3. Statement I is true but Statement II is false [Option ID = 19047]
4. Statement I is false but Statement II is true [Option ID = 19048]

13) Which type of mouldboard is preferred for more sticky soils, where it is difficult for other mouldboard to scour well[Question ID = 4763][Question Description = 113_63_PBF_SEP22_Q13]

1. General purpose [Option ID = 19049]
2. Stubble [Option ID = 19050]
3. Sod [Option ID = 19051]
4. Slat [Option ID = 19052]

14) Operating with restrained links rather than free links provides greater tractor stability. What happens to the vertical load on the tractor rear wheels, while operating with restrained links?

[Question ID = 4764][Question Description = 114_63_PBF_SEP22_Q14]

1. increases
[Option ID = 19053]
2. decreases
[Option ID = 19054]
3. remains same
[Option ID = 19055]
4. no effect on vertical load
[Option ID = 19056]

15) Calculate the oxygen consumption for the agricultural worker in litres per minute, if he expires 180 litres of air having 16% of oxygen in 6 minutes duration.[Question ID = 4765][Question Description = 115_63_PBF_SEP22_Q15]

1. 6.0 [Option ID = 19057]
2. 4.5 [Option ID = 19058]
3. 3.0 [Option ID = 19059]
4. 1.5 [Option ID = 19060]

16) In which gasifier the products from the pyrolysis zone and drying zone pass through oxidation zone causing thermal cracking of volatiles.[Question ID = 4766][Question Description = 116_63_PBF_SEP22_Q16]

1. up draft [Option ID = 19061]
2. down draft [Option ID = 19062]
3. cross draft [Option ID = 19063]
4. fluidized bed [Option ID = 19064]

17) In offset disc harrow as compared to rear gang the couple acting on front gang is:[Question ID = 4767][Question Description = 117_63_PBF_SEP22_Q17]

1. larger [Option ID = 19065]
2. smaller [Option ID = 19066]
3. similar [Option ID = 19067]
4. considerably smaller [Option ID = 19068]

18) The efficiency of diesel engine with high compression and early fuel cut-off is:[Question ID = 4768][Question Description = 118_63_PBF_SEP22_Q18]

1. minimum [Option ID = 19069]
2. maximum [Option ID = 19070]
3. average [Option ID = 19071]
4. lower than average [Option ID = 19072]

19) Front loading is provided on tractors for:[Question ID = 4769][Question Description = 119_63_PBF_SEP22_Q19]

1. increase in pull [Option ID = 19073]
2. weight transfer [Option ID = 19074]
3. safety [Option ID = 19075]
4. lowering vibration [Option ID = 19076]

20) Which type of joint represents the shoulder joints and hip joints?[Question ID = 4770][Question Description = 120_63_PBF_SEP22_Q20]

1. gliding [Option ID = 19077]
2. hinge [Option ID = 19078]
3. saddle [Option ID = 19079]
4. ball & socket [Option ID = 19080]

21) The pupose of batter slope in bench terrace is

[Question ID = 4771][Question Description = 121_63_PBF_SEP22_Q21]

1. to provide stability to filled soil [Option ID = 19081]
2. protection against soil erosion [Option ID = 19082]
3. conserve moisture content [Option ID = 19083]
4. increase water retention [Option ID = 19084]

22) Match List I with List II

List I	List II
A. Metacentre	I. Flow in river
B. Piezometer tube	II. Application of transmission of liquid pressure
C. Hydraulic press	III. Stability of ship
D. Turbulent flow	IV. Static pressure head
	V. Froude's number

Choose the correct answer from the options given below:

[Question ID = 4772][Question Description = 122_63_PBF_SEP22_Q22]

1. A - III, B - I, C - IV, D - V [Option ID = 19085]
2. A - II, B - V, C - IV, D - I [Option ID = 19086]
3. A - III, B - IV, C - II, D - V [Option ID = 19087]
4. A - III, B - IV, C - II, D - I [Option ID = 19088]

23) Given below are two statements

Statement I: Hydraulic jump is a local phenomenon.

Statement II: Hydraulic jump occurs, when the flow changes from super critical flow to sub-critical flow.

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

[Question ID = 4773][Question Description = 123_63_PBF_SEP22_Q23]

1. Both Statement I and Statement II are true [Option ID = 19089]
2. Both Statement I and Statement II are false [Option ID = 19090]
3. Statement I is true but Statement II is false [Option ID = 19091]
4. Statement I is false but Statement II is true [Option ID = 19092]

24) Which sequence of water erosion is classified ?

- A. Raindrop erosion
- B. Rill erosion
- C. Stream bank erosion
- D. Sheet erosion
- E. Gully erosion

Choose the *correct* answer from the options given below

[Question ID = 4774][Question Description = 124_63_PBF_SEP22_Q24]

1. A, C, B, E, D [Option ID = 19093]
2. A, D, B, E, C [Option ID = 19094]
3. A, B, E, D, C [Option ID = 19095]
4. A, D, B, C, E [Option ID = 19096]

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

Assertion A : A cross drainage work is generally a costly construction and must be avoided as far as possible.

Reason R : A cross drainage work is a structure which is constructed at the crossing of a canal and a natural drain, so as dispose of drainage water without interrupting the continuous canal supplies.

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

[Question ID = 4775][Question Description = 125_63_PBF_SEP22_Q25]

1. Both A and R are true and R is the correct explanation of A [Option ID = 19097]
2. Both A and R are true but R is NOT the correct explanation of A [Option ID = 19098]
3. A is true but R is false [Option ID = 19099]
4. A is false but R is true [Option ID = 19100]

26) Match List I with List II

List I	List II
A. Field channel	I. Warabandi system
B. Base period	II. On Farm Development work
C. Rotational irrigation	III. Cross-drainage work
D. Aqueduct	IV. First irrigation to last irrigation
	V. Time from sowing to harvest of crop

Choose the correct answer from the options given below:

[Question ID = 4776][Question Description = 126_63_PBF_SEP22_Q26]

1. A - II , B - V , C - III, D - I [Option ID = 19101]
2. A - II, B - IV , C - I , D - III [Option ID = 19102]
3. A -II , B -V , C - IV, D - I [Option ID = 19103]
4. A - III, B -V , C -IV , D -II [Option ID = 19104]

27) Given below are two statements

Statement I: Gross command area of a major irrigation project is more than the culturable command area.

Statement II: Base period of a crop is more than crop period.

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

[Question ID = 4777][Question Description = 127_63_PBF_SEP22_Q27]

1. Both Statement I and Statement II are true [Option ID = 19105]
2. Both Statement I and Statement II are false [Option ID = 19106]
3. Statement I is true but Statement II is false [Option ID = 19107]
4. Statement I is false but Statement II is true [Option ID = 19108]

28) A. The zone of aeration consists of interstices occupied partially by water and partially by air.

B. Specific yield is the moisture content of soil in the zone of aeration.

C. In the zone of saturation all interstices are filled with water under hydrostatic pressure.

D. Capillary zone is a sub-zone of zone of saturation.

E. The thickness of the capillary zone will vary inversely with the pore size of the soil or rock.

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

[Question ID = 4778][Question Description = 128_63_PBF_SEP22_Q28]

1. A, B and D only [Option ID = 19109]
2. A, B, D and E only [Option ID = 19110]
3. A, C and E only [Option ID = 19111]
4. A, C, D and E only [Option ID = 19112]

29) Maximum water development can only be attained by combined use of surface and groundwater is known as[Question ID = 4779][Question Description = 129_63_PBF_SEP22_Q29]

1. Capillary use [Option ID = 19113]
2. Conjunctive use [Option ID = 19114]
3. Consumptive use [Option ID = 19115]
4. Safe yield [Option ID = 19116]

30) Contour trenching is NOT suitable on the slopes

[Question ID = 4780][Question Description = 130_63_PBF_SEP22_Q30]

1. less than 20 % [Option ID = 19117]
2. greater than 20 % [Option ID = 19118]
3. less than 10 % [Option ID = 19119]
4. less than 2 % [Option ID = 19120]

31) Given below are two statements

Statement I: Bunds are constructed with land slope 2 to 10 %.

Statement II: Contour bunds are recommended for the areas of low rainfall.

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

[Question ID = 4781][Question Description = 131_63_PBF_SEP22_Q31]

1. Both Statement I and Statement II are true [Option ID = 19121]
2. Both Statement I and Statement II are false [Option ID = 19122]
3. Statement I is true but Statement II is false [Option ID = 19123]
4. Statement I is false but Statement II is true [Option ID = 19124]

32) Match List I with List II

List I	List II
A. Intensity of pressure	I. Dupuit's formula
B. Flow through porous media	II. Manning's formula
C. Channel design	III. Darcy's law
D. Well hydraulics	IV. Pascal's law
	V. Archimedes' principle

Choose the correct answer from the options given below:

[Question ID = 4782][Question Description = 132_63_PBF_SEP22_Q32]

1. A - IV, B - III, C - II, D - I [Option ID = 19125]
2. A - IV, B - III, C - II, D - V [Option ID = 19126]
3. A - V, B - II, C - III, D - IV [Option ID = 19127]
4. A - III, B - II, C - I, D - V [Option ID = 19128]

33) Given below are two statements

Statement I: Diversion drain has lesser grade and is laid along the slope.

Statement II: Grassed waterway is laid across the slope.

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

[Question ID = 4783][Question Description = 133_63_PBF_SEP22_Q33]

1. Both Statement I and Statement II are true [Option ID = 19129]
2. Both Statement I and Statement II are false [Option ID = 19130]
3. Statement I is true but Statement II is false [Option ID = 19131]
4. Statement I is false but Statement II is true [Option ID = 19132]

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

Assertion A: In arid region percussion drilling method of tubewell construction is adopted.

Reason R: In percussion drilling method of tubewell construction minimum water is required.

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

[Question ID = 4784][Question Description = 134_63_PBF_SEP22_Q34]

1. Both A and R are correct and R is the correct explanation of A [Option ID = 19133]
2. Both A and R are correct but R is NOT the correct explanation of A [Option ID = 19134]
3. A is correct but R is not correct [Option ID = 19135]
4. A is not correct but R is correct [Option ID = 19136]

35) A hydrograph is a plot of [Question ID = 4785][Question Description = 135_63_PBF_SEP22_Q35]

1. Cumulative runoff against time [Option ID = 19137]
2. Cumulative rainfall against time [Option ID = 19138]
3. Rainfall intensity against time [Option ID = 19139]
4. Stream discharge against time [Option ID = 19140]

36) A Cipolletti weir is a trapezoidal weir having side slope of [Question ID = 4786][Question Description = 136_63_PBF_SEP22_Q36]

1. 1 vertical to 4 horizontal [Option ID = 19141]
2. 1 horizontal to 4 vertical [Option ID = 19142]
3. 1 vertical to 2 horizontal [Option ID = 19143]
4. 1 horizontal to 2 vertical [Option ID = 19144]

37) The tube wells are compared with respect to their[Question ID = 4787][Question Description = 137_63_PBF_SEP22_Q37]

1. Well yield [Option ID = 19145]
2. Well efficiency [Option ID = 19146]
3. Specific capacity [Option ID = 19147]
4. Specific yield [Option ID = 19148]

38) Given below are two statements

Statement I: A canal outlet is a structure built at the head of the tertiary unit to deliver water from the canal to the field water courses.

Statement II: Water is taken from the field water courses for irrigating individual fields.

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

[Question ID = 4788][Question Description = 138_63_PBF_SEP22_Q38]

1. Both Statement I and Statement II are true [Option ID = 19149]
2. Both Statement I and Statement II are false [Option ID = 19150]
3. Statement I is true but Statement II is false [Option ID = 19151]
4. Statement I is false but Statement II is true [Option ID = 19152]

39) Given below are two statements

Statement I: In planning farm irrigation system, the alignment of field channels are generally done on ridges.

Statement II: Field channel is not a component of on-farm development work.

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

[Question ID = 4789][Question Description = 139_63_PBF_SEP22_Q39]

1. Both Statement I and Statement II are true [Option ID = 19153]
2. Both Statement I and Statement II are false [Option ID = 19154]
3. Statement I is true but Statement II is false [Option ID = 19155]
4. Statement I is false but Statement II is true [Option ID = 19156]

40) Given below are two statements

Statement I: The absolute pressure is equal to the sum of atmospheric pressure and vacuum pressure.

Statement II: The pressure measured with the help of a piezometer tube is gauge pressure.

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

[Question ID = 4790][Question Description = 140_63_PBF_SEP22_Q40]

1. Both Statement I and Statement II are true [Option ID = 19157]
2. Both Statement I and Statement II are false [Option ID = 19158]
3. Statement I is true but Statement II is false [Option ID = 19159]
4. Statement I is false but Statement II is true [Option ID = 19160]

41) Properties which deals with deformation and flow of the material under the action of applied force are -

- A. Electrical properties
- B. Rheological properties
- C. Physical properties
- D. Frictional properties
- E. Optical properties

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

[Question ID = 4791][Question Description = 141_63_PBF_SEP22_Q41]

1. A only [Option ID = 19161]
2. B only [Option ID = 19162]
3. C and B only [Option ID = 19163]
4. D and E only [Option ID = 19164]

42) Match List I with List II

List I	List II
A. Protein	I. Pasteurization
B. HTST	II. Amino acid
C. Multiple effect	III. Gelatinization
D. Starch	IV. Evaporator

Choose the correct answer from the options given below:

[Question ID = 4792][Question Description = 142_63_PBF_SEP22_Q42]

1. A - II, B - I, C - III, D - IV [Option ID = 19165]
2. A - II, B - IV, C - I, D - III [Option ID = 19166]
3. A - II, B - I, C - IV, D - III [Option ID = 19167]
4. A - I, B - II, C - IV, D - III [Option ID = 19168]

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

Assertion A : Sensible cooling increases the relative humidity of air.

Reason R : Humidity ratio of air does not change during sensible cooling.

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

[Question ID = 4793][Question Description = 143_63_PBF_SEP22_Q43]

1. Both A and R are true and R is the correct explanation of A [Option ID = 19169]
2. Both A and R are true but R is NOT the correct explanation of A [Option ID = 19170]
3. A is true but R is false [Option ID = 19171]
4. A is false but R is true [Option ID = 19172]

44) Cover and plinth is a method of [Question ID = 4794][Question Description = 144_63_PBF_SEP22_Q44]

1. Fruit storage [Option ID = 19173]
2. Grain storage [Option ID = 19174]
3. Vegetable storage [Option ID = 19175]
4. Packaging [Option ID = 19176]

45) Which among the following equipment is used to separate the material of same size and of different densities?

- A. Screen cleaner
- B. Destoner
- C. Roller sorter
- D. Diverging belt sorter
- E. Specific gravity separator

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

[Question ID = 4795][Question Description = 145_63_PBF_SEP22_Q45]

1. A, B and D only [Option ID = 19177]
2. E only [Option ID = 19178]
3. A, B and C only [Option ID = 19179]
4. B and E only [Option ID = 19180]

46) Energy requirement equation for size reduction is given by

[Question ID = 4796][Question Description = 146_63_PBF_SEP22_Q46]

1. Newton [Option ID = 19181]
2. Janssen [Option ID = 19182]
3. Rittinger [Option ID = 19183]
4. Airy [Option ID = 19184]

47) Moisture content at which rate of drying ceases to be constant is known as

[Question ID = 4797][Question Description = 147_63_PBF_SEP22_Q47]

1. Equilibrium moisture content [Option ID = 19185]
2. Stop moisture content [Option ID = 19186]
3. Critical moisture content [Option ID = 19187]
4. Constant rate moisture content [Option ID = 19188]

48) Process of parboiling includes which of the following unit operations?

- A. Soaking
- B. Steaming
- C. Drying
- D. Pearling
- E. Dehusking

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

[Question ID = 4798][Question Description = 148_63_PBF_SEP22_Q48]

- 1. B and C only [Option ID = 19189]
- 2. A, B and C only [Option ID = 19190]
- 3. A, B and D only [Option ID = 19191]
- 4. C and E only [Option ID = 19192]

49) Given below are two statements, one is labelled as Assertion A and the other is labelled as Reason R
Assertion A : Under identical temperatures of hot and cold fluids, parallel flow heat exchangers are efficient than counter flow heat exchangers.

Reason R : Temperature gradient gradually reduces along the length of parallel flow heat exchangers.

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

[Question ID = 4799][Question Description = 149_63_PBF_SEP22_Q49]

- 1. Both A and R are true and R is the correct explanation of A [Option ID = 19193]
- 2. Both A and R are true but R is NOT the correct explanation of A [Option ID = 19194]
- 3. A is true but R is false [Option ID = 19195]
- 4. A is false but R is true [Option ID = 19196]

50) Which of the following process destroys microbes including spores?

- A. Parboiling
- B. Evaporation
- C. Drying
- D. Sterilization
- E. Pasteurization

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

[Question ID = 4800][Question Description = 150_63_PBF_SEP22_Q50]

- 1. B only [Option ID = 19197]
- 2. A and D only [Option ID = 19198]
- 3. D only [Option ID = 19199]
- 4. C and E only [Option ID = 19200]

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1) A wind generator with 10 m diameter blade span has a cut in wind speed (minimum speed for power generation) of 5 m.s⁻¹. The turbine generates 3 kW electric power. Efficiency of the wind turbine generator set will be.

[Question ID = 4951][Question Description = 101_67_REE_SEP22_Q01]

- 1. 0.50
[Option ID = 19801]
- 2. 0.55
[Option ID = 19802]
- 3. 0.45
[Option ID = 19803]
- 4. 0.40
[Option ID = 19804]

2) What will be the hot temperature in the sea bed to produce 1 MW of electricity from OTEC for a given flow rate of 650 t/h and DT = 20 °C. Given, specific heat of water is 4200 J/kg °C.[Question ID = 4952][Question Description =

102_67_REE_SEP22_Q02]

1. 35 °C [Option ID = 19805]
2. 30 °C [Option ID = 19806]
3. 45 °C [Option ID = 19807]
4. 40 °C [Option ID = 19808]

3) A farmer has 8 nos. of cows. What will be the digester volume of the biogas digester for the following given data: Digester retention period=20days; Fermentation temperature=30 °C; dry mater considered per cow per day=2 kg; Burner efficiency=0.7 and methane proportion=0.7?

[Question ID = 4953][Question Description = 103_67_REE_SEP22_Q03]

1. 60 m³ [Option ID = 19809]
2. 64 m³ [Option ID = 19810]
3. 65 m³ [Option ID = 19811]
4. 70 m³ [Option ID = 19812]

4) What is the molar rate of air supply required to achieve air equivalence ratio of 0.3 for a complete oxidized wood mulch/animal waste having formula $CH_{1.6}O_{0.62}N_{0.1}S_{0.001}$ represented as $CH_wO_xN_yS_z$. Given, $\alpha_{stoich} = 1 + \frac{w}{4} + 2 - \frac{x}{2}$?

[Question ID = 4954][Question Description = 104_67_REE_SEP22_Q04]

1. 0.33 mole air/mole C in fuel [Option ID = 19813]
2. 0.37 mole air/mole C in fuel [Option ID = 19814]
3. 0.40 mole air/mole C in fuel [Option ID = 19815]
4. 0.30 mole air/mole C in fuel [Option ID = 19816]

5) Percentage of cold gas efficiency can be expressed as[Question ID = 4955][Question Description = 105_67_REE_SEP22_Q05]

$$1. \frac{HHV_{gas} \times V_{gas}}{HHV_{fuel} \times m_{fuel}} \times 100$$

[Option ID = 19817]

$$2. \frac{HHV_{gas} \times m_{fuel}}{HHV_{fuel} \times m_{gas}} \times 100$$

[Option ID = 19818]

$$3. \frac{HHV_{gas} \times HHV_{fuel}}{(HHV_{gas} + HHV_{fuel}) \times m_{fuel}} \times 100$$

[Option ID = 19819]

$$4. \frac{HHV_{fuel} \times m_{fuel}}{HHV_{gas} \times V_{gas}} \times 100$$

[Option ID = 19820]

6) Cellulosic biomass conversion into fuel uses which path[Question ID = 4956][Question Description = 106_67_REE_SEP22_Q06]

1. Gasification [Option ID = 19821]
2. Pyrolysis and gasification [Option ID = 19822]
3. Hydrothermal processing and pyrolysis [Option ID = 19823]
4. Gasification, pyrolysis and hydrothermal processing [Option ID = 19824]

7) The best and economic thermal storage of heat for solar drying[Question ID = 4957][Question Description = 107_67_REE_SEP22_Q07]

1. Gravel pack [Option ID = 19825]
2. Phase change material [Option ID = 19826]
3. Sand [Option ID = 19827]
4. Soil [Option ID = 19828]

8) The temperature range achieved in enclosed box type solar cooker with reflector is

[Question ID = 4958][Question Description = 108_67_REE_SEP22_Q08]

1. About 15 to 20 °C higher than simple box type collector

[Option ID = 19829]

2. About 20 to 25 °C higher than simple box type collector

[Option ID = 19830]

3. About 10 to 15°C higher than simple box type collector

[Option ID = 19831]

4. About 5 to 15°C higher than simple box type collector

[Option ID = 19832]

9) The tilt factor (r_d) for diffused radiation can be expressed as :

[Question ID = 4959][Question Description = 109_67_REE_SEP22_Q09]

1. $r_d = 1 + \frac{\cos \beta}{2}$

[Option ID = 19833]

2. $r_d = \frac{1.5 + \cos \beta}{2.5}$

[Option ID = 19834]

3. $r_d = \frac{1 + \cos \beta}{2}$

[Option ID = 19835]

4. $r_d = \frac{1}{2} + \cos \beta$

[Option ID = 19836]

10) Earth reflects about one third of the sunlight that falls on it, is called :

[Question ID = 4960][Question Description = 110_67_REE_SEP22_Q10]

1. Spectrum

[Option ID = 19837]

2. Reflectivity

[Option ID = 19838]

3. Radiation

[Option ID = 19839]

4. Albedo

[Option ID = 19840]

11) Extra terrestrial solar radiation can be expressed as :

A. $I_{ext} = I_{sc} (1 + 0.033 \cos 360n/365)$

B. $I_{ext} = I_{sc} (1.5 + 0.033 \cos 360n/365)$

C. $I_{ext} = I_{sc} + (0.033 \cos 360n/365)I_{sc}$

D. $I_{ext} = I_{sc} 0.33 \cos 360n/365$

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

[Question ID = 4961][Question Description = 111_67_REE_SEP22_Q11]

1. A, B and D only

[Option ID = 19841]

2. B and C only

[Option ID = 19842]

3. A and C only

[Option ID = 19843]

4. B, C and D only

[Option ID = 19844]

12) Which of the following are different types of vertical axis wind turbines?

A. Darrieus rotor

B. Musgrove rotor

C. Savonius rotor

D. Macney rotor

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

[Question ID = 4962][Question Description = 112_67_REE_SEP22_Q12]

1. A, C and D only [Option ID = 19845]
2. A, B and C only [Option ID = 19846]
3. A and C only [Option ID = 19847]
4. A and B only [Option ID = 19848]

13) Geothermal energy is used in India for the purpose of :

- A. Power generation
- B. Space heating
- C. Extraction and refining of borax and sulphur
- D. Refrigeration
- E. Geomethanation

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

[Question ID = 4963][Question Description = 113_67_REE_SEP22_Q13]

1. A, B and D only
[Option ID = 19849]
2. A, B, C and D only
[Option ID = 19850]
3. B, C, D and E only
[Option ID = 19851]
4. A, C, D and E only
[Option ID = 19852]

14) In Brayton cycle, heat transfer to and from the working fluid are :

- A. $q_{in}=h_3-h_2 = C_p (T_3-T_2)$
- B. $q_{out}=h_4-h_1 = C_p (T_4-T_1)$
- C. $q_{in}=h_4-h_1 = C_p (T_3-T_2)$
- D. $q_{out}=h_3-h_2 = C_p (T_4-T_1)$

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

[Question ID = 4964][Question Description = 114_67_REE_SEP22_Q14]

1. A, B and C only
[Option ID = 19853]
2. A and B only
[Option ID = 19854]
3. A and C only
[Option ID = 19855]
4. B and D only
[Option ID = 19856]

15) Match List I with List II

List I	List II
A. Brayton cycle	I. Process heat and electricity power
B. Rankine cycle	II. Process heating
C. Stirling cycle	III. Gas turbine
D. Cogeneration cycle	IV. Vapour power cycle
	V. Gas engine

Choose the correct answer from the options given below:

[Question ID = 4965][Question Description = 115_67_REE_SEP22_Q15]

1. A - II, B - I, C - IV, D - V [Option ID = 19857]
2. A - I, B - II, C - III, D - V [Option ID = 19858]
3. A - III, B - IV, C - V, D - I [Option ID = 19859]

4. A - V, B - IV, C - III, D - I [Option ID = 19860]

16) Match List I with List II

List I	List II
A. Fermentation	I. Hydrogen, Alkanes, Furans
B. Dehydration	II. Aromatics, Alkanes
C. Aqueous-phase processing	III. Solid fuel
D. Lignin upgrading	IV. Aromatics
	V. Ethanol, butanol

Choose the correct answer from the options given below:

[Question ID = 4966][Question Description = 116_67_REE_SEP22_Q16]

1. A -II , B -III , C -IV , D -V [Option ID = 19861]
2. A -III , B -IV , C -II , D -I [Option ID = 19862]
3. A -V, B -IV , C -II , D -I [Option ID = 19863]
4. A -V , B -IV , C -I , D -II [Option ID = 19864]

17) Match List I with List II

List I	List II
A. Drying zone	I. $\text{CH}_4 + \text{H}_2\text{O} \rightleftharpoons 3\text{H}_2 + \text{CO}$
B. Pyrolysis zone	II. Wet biomass+ heat $\rightarrow \text{CH}_w\text{O}_x\text{N}_y\text{S}_z + \text{H}_2\text{O}$
C. Combustion zone	III. $\text{C} + \text{H}_2\text{O} \rightleftharpoons \text{CO} + \text{H}_2$
D. Reduction zone	IV. $\text{CO} + \text{H}_2\text{O} \rightleftharpoons \text{CO}_2 + \text{H}_2$
	V. $\text{CH}_w\text{O}_x\text{N}_y\text{S}_z + \text{H}_2\text{O} \rightarrow \text{Char} + \text{tar/oil} + a\text{N}_2 + c\text{H}_2\text{S} + d\text{H}_2\text{O} + e\text{H}_2 + f\text{CH}_4$

Choose the correct answer from the options given below:

[Question ID = 4967][Question Description = 117_67_REE_SEP22_Q17]

1. A -III , B -IV , C -II , D -I
[Option ID = 19865]
2. A -II , B -V , C -I , D -III
[Option ID = 19866]
3. A -I , B -II , C -III , D -IV
[Option ID = 19867]
4. A -IV , B -III , C -I , D -V
[Option ID = 19868]

18) Match List I with List II

List I	List II
A. Human	I. 48.12 MJ/kg
B. Electric motor	II. 56.31 MJ/kg
C. Farm machinery	III. 62.7 MJ/kg
D. Diesel	IV. 64.8MJ/kg
	V. 1.96 MJ/man-h

Choose the correct answer from the options given below:

[Question ID = 4968][Question Description = 118_67_REE_SEP22_Q18]

1. A -I , B -II , C -III , D -IV [Option ID = 19869]
2. A -V, B -II , C -I , D -III [Option ID = 19870]
3. A -V , B -IV , C -III , D -II [Option ID = 19871]
4. A -IV , B -III , C -I , D -II [Option ID = 19872]

19) Match List I with List II

List I	List II
A. UASB	I. Green building
B. Energy efficient	II. Solar collector
C. Transmittance - absorptance	III. Biogas reactor
D. Betz coefficient	IV. Thermo chemical conversion

V. Wind energy

Choose the correct answer from the options given below:

[Question ID = 4969][Question Description = 119_67_REE_SEP22_Q19]

1. A - IV , B - II , C - V , D - III [Option ID = 19873]
2. A - IV , B - I , C - II , D - III [Option ID = 19874]
3. A - III , B - II , C - V , D - I [Option ID = 19875]
4. A - III , B - I , C - II , D - V [Option ID = 19876]

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

Assertion A: Fill factor of the solar cell is ranging between 0 to 1

Reason R: Fill factor is an important characteristic of solar cell and can be determined by the ratio of $I_m V_m$ to $I_{sc} V_{oc}$

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

[Question ID = 4970][Question Description = 120_67_REE_SEP22_Q20]

1. Both A and R are correct and R is the correct explanation of A [Option ID = 19877]
2. Both A and R are correct but R is NOT the correct explanation of A [Option ID = 19878]
3. A is correct but R is not correct [Option ID = 19879]
4. A is not correct but R is correct [Option ID = 19880]

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

Assertion A: Hydrogen gas is cleaner than compressed natural gas

Reason R: Carbon acts as a form of pollutant in CNG where as hydrogen is waste free and the fusion of hydrogen does not produce any waste.

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

[Question ID = 4971][Question Description = 121_67_REE_SEP22_Q21]

1. Both A and R are correct and R is the correct explanation of A [Option ID = 19881]
2. Both A and R are correct but R is NOT the correct explanation of A [Option ID = 19882]
3. A is correct but R is not correct [Option ID = 19883]
4. A is not correct but R is correct [Option ID = 19884]

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

Assertion A: Community solar cooker works on the thermo-syphon principle and can operate in three modes.

Reason R: The collector is always mounted below the water storage tank, so that cold water from the tank reaches the collector via a descending water pipe.

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

[Question ID = 4972][Question Description = 122_67_REE_SEP22_Q22]

1. Both A and R are correct and R is the correct explanation of A
[Option ID = 19885]
2. Both A and R are correct but R is NOT the correct explanation of A
[Option ID = 19886]
3. A is correct but R is not correct
[Option ID = 19887]
4. A is not correct but R is correct
[Option ID = 19888]

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

Assertion A: The NPV method yields an accurate ROI based on discounted cash flow calculations.

Reason R: The NPV method is used to determine net past value of the cash flow in a project.

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

[Question ID = 4973][Question Description = 123_67_REE_SEP22_Q23]

1. Both A and R are correct and R is the correct explanation of A [Option ID = 19889]
2. Both A and R are correct but R is NOT the correct explanation of A [Option ID = 19890]
3. A is correct but R is not correct [Option ID = 19891]
4. A is not correct but R is correct [Option ID = 19892]

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

Assertion A: Tidal is the energy derived from rising and falling of ocean

Reason R: Tides are due to the gravitational pull of the moon on water in the ocean

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

[Question ID = 4974][Question Description = 124_67_REE_SEP22_Q24]

1. Both A and R are correct and R is the correct explanation of A [Option ID = 19893]
2. Both A and R are correct but R is NOT the correct explanation of A [Option ID = 19894]
3. A is correct but R is not correct [Option ID = 19895]
4. A is not correct but R is correct [Option ID = 19896]

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

Assertion A: Silver metal is used for joining various solar cells in module.

Reason R: Silver is a shiny metal

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

[Question ID = 4975][Question Description = 125_67_REE_SEP22_Q25]

1. Both A and R are correct and R is the correct explanation of A
[Option ID = 19897]
2. Both A and R are correct but R is NOT the correct explanation of A
[Option ID = 19898]
3. A is correct but R is not correct
[Option ID = 19899]
4. A is not correct but R is correct
[Option ID = 19900]

26) Which of the following are characteristics of an ideal energy crop?

[Question ID = 4976][Question Description = 126_67_REE_SEP22_Q26]

1. High yield, high energy input to produce, high cost and high nutrient requirements [Option ID = 19901]
2. High yield, low energy input to produce, low cost and low nutrient requirements [Option ID = 19902]
3. High yield, high energy input to produce, low cost and high nutrient requirements [Option ID = 19903]
4. Low yield, high energy input to produce, high cost and high nutrient requirements [Option ID = 19904]

27) How does hydrogen fuel cell work?[Question ID = 4977][Question Description = 127_67_REE_SEP22_Q27]

1. Membrane → hydrogen ions → electric current and recombination with oxygen [Option ID = 19905]
2. Electric current and recombination with oxygen → hydrogen ions → membrane [Option ID = 19906]
3. Hydrogen ions → membrane → electric current and recombination with oxygen [Option ID = 19907]
4. Recombination with oxygen → electric current → membrane → hydrogen ions [Option ID = 19908]

28) A non-concentrating solar collector is which :

[Question ID = 4978][Question Description = 128_67_REE_SEP22_Q28]

1. Collects and stores sunlight
[Option ID = 19909]
2. Collects and concentrates sunlight
[Option ID = 19910]
3. Reflects sunlight
[Option ID = 19911]
4. Directly uses the incoming global radiation
[Option ID = 19912]

29) What are the types of geothermal energy resources?[Question ID = 4979][Question Description = 129_67_REE_SEP22_Q29]

1. Hydrothermal, geo-pressurised brines, hot dry rocks, magma [Option ID = 19913]
2. Hydrothermal, geo-pressurised brines, hot dry rocks, sun [Option ID = 19914]
3. Biomass, geo-pressurised brines, hot dry rocks [Option ID = 19915]
4. Wind, magma, geopressurised brines, hydrothermal [Option ID = 19916]

30) Which of the following is an example of physio-chemical conversion technique to convert biomass into usable forms of

energy?

[Question ID = 4980][Question Description = 130_67_REE_SEP22_Q30]

1. Pyrolysis [Option ID = 19917]
2. Gasification [Option ID = 19918]
3. Anaerobic Digestion [Option ID = 19919]
4. Extraction with esterification [Option ID = 19920]

31) Following are the few terminology used for wind energy

- A. Contours of constant average wind velocity is called isovents
- B. Contours of constant average wind velocity is called isodynes
- C. Contours of constant wind power is called isodynes
- D. Contours of constant wind power is called isovents

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

[Question ID = 4981][Question Description = 131_67_REE_SEP22_Q31]

1. A, B and D only [Option ID = 19921]
2. A and B only [Option ID = 19922]
3. A and C only [Option ID = 19923]
4. B, C and D only [Option ID = 19924]

32) The factors which affect the nature of the wind close to the surface of the earth are :

- A. Latitude of the place
- B. Scale of the hours, month or year
- C. Longitude of the place
- D. Topography of the place

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

[Question ID = 4982][Question Description = 132_67_REE_SEP22_Q32]

1. A, C and D only
[Option ID = 19925]
2. A, B and D only
[Option ID = 19926]
3. A and C only
[Option ID = 19927]
4. A, B, C and D
[Option ID = 19928]

33) Following are the instruments used for measuring solar radiation

- A. A pyranometer is an instrument which measures either global or diffuse radiation over a hemispherical field of view
- B. A pyrliometer is an instrument which measures beam radiation
- C. A pyrliometer is an instrument which measures either global or diffuse radiation over a hemispherical field of view
- D. A pyranometer is an instrument which measures beam radiation
- E. The duration of bright sunshine in a day is measured by means of a sunshine recorder

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

[Question ID = 4983][Question Description = 133_67_REE_SEP22_Q33]

1. C, D and E only
[Option ID = 19929]
2. A, B and E only
[Option ID = 19930]
3. A and B only
[Option ID = 19931]
4. C and D only
[Option ID = 19932]

34) Consider the following statements for its correctness :

- A. The diameter of earth is 1.27×10^4 km, diameter of the sun is 1.39×10^6 km and the mean distance between the two is 1.5×10^8 km
- B. The beam radiation received from the sun on the earth is almost parallel
- C. The sun subtends an angle of 33 minutes at the earth's surface
- D. The diameter of earth is 1.27×10^5 km, diameter of the sun is 1.39×10^6 km and the mean distance between the two is 1.5×10^7 km
- E. The beam radiation received from the sun on the earth is almost perpendicular

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

[Question ID = 4984][Question Description = 134_67_REE_SEP22_Q34]

- 1. A, B and C only
[Option ID = 19933]
- 2. B, C and D only
[Option ID = 19934]
- 3. A, C and E only
[Option ID = 19935]
- 4. A and B only
[Option ID = 19936]

35) The direct energy sources in agriculture production are :

- A. Diesel
- B. Electricity
- C. Seed
- D. Fertilizer
- E. Human

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

[Question ID = 4985][Question Description = 135_67_REE_SEP22_Q35]

- 1. A, B and D only
[Option ID = 19937]
- 2. A, B and E only
[Option ID = 19938]
- 3. C and D only
[Option ID = 19939]
- 4. C, D and E only
[Option ID = 19940]

36) What will be the hour angle at sunrise and sunset on June 21 for a surface inclined at an angle of 10° and facing due south ($\gamma = 0^\circ$). The surface is located in Mumbai ($19^\circ 07' N$, $72^\circ 51' E$)?

[Question ID = 4986][Question Description = 136_67_REE_SEP22_Q36]

- 1. $\pm 94.5^\circ$ [Option ID = 19941]
- 2. $\pm 90.0^\circ$ [Option ID = 19942]
- 3. $\pm 89.5^\circ$ [Option ID = 19943]
- 4. $\pm 94.0^\circ$ [Option ID = 19944]

37) A collector is located in New Delhi ($28^\circ 35' N$, $77^\circ 12' E$), and is tilted at an angle of 36° with the horizontal and is pointing due south. The angle made by the beam radiation with the normal to a flat plate collector on December 1 at 0900 h (local apparent time) will be :

[Question ID = 4987][Question Description = 137_67_REE_SEP22_Q37]

- 1. 45.1°
[Option ID = 19945]

2. 45.9°

[Option ID = 19946]

3. 45.7°

[Option ID = 19947]

4. 50.0°

[Option ID = 19948]

38) In a solar flat plate heater, the flux incident has a value of 800 W.m^{-2} . The temperature inside the collector is 60°C while the outside air is at 32°C . What will be the collection efficiency per unit area if the convection coefficient is $15 \text{ W/m}^2\text{K}$?

[Question ID = 4988][Question Description = 138_67_REE_SEP22_Q38]

1. 89.3% [Option ID = 19949]

2. 53.7% [Option ID = 19950]

3. 47.5% [Option ID = 19951]

4. 45.2% [Option ID = 19952]

39) Which methods are followed in two step biomethanation process of crop residue?[Question ID = 4989][Question Description = 139_67_REE_SEP22_Q39]

1. 1st stage aerobic and 2nd stage anaerobic [Option ID = 19953]

2. 1st stage anaerobic and 2nd stage aerobic [Option ID = 19954]

3. Both stage aerobic [Option ID = 19955]

4. Both stage anaerobic [Option ID = 19956]

40) Which is the correct equation for conversion of sugar during photosynthesis?[Question ID = 4990][Question Description = 140_67_REE_SEP22_Q40]

1. $\text{CO}_2 + \text{H}_2\text{O} + \text{Sunlight} \rightarrow (\text{CH}_2\text{O})_x + \text{O}_2$

[Option ID = 19957]

2. $\text{CO} + \text{H}_2 + \text{Sunlight} \rightarrow (\text{CH}_3\text{O})_x + \text{O}_2$

[Option ID = 19958]

3. $\text{CO}_2 + \text{Sunlight} \rightarrow (\text{CH}_2\text{O})_x + \text{H}_2\text{O} + \text{O}_2$

[Option ID = 19959]

4. $(\text{CH}_2\text{O})_x + \text{Sunlight} \rightarrow \text{CO}_2 + \text{H}_2\text{O}$

[Option ID = 19960]

41) Match List I with List II

List I	List II
A. Zenith angle	I. Angle made by the line joining the centres of the sun and the earth with its projection on the equatorial plane
B. Latitude	II. Angle made in the horizontal plane between the line due south and the projection of the normal to the surface on the horizontal plane
C. Declination	III. Angle made by the plane surface with the horizontal
D. Surface azimuth angle	IV. Angle made by the sun's rays with the normal to a horizontal surface
	V. Angle made by the radial line joining the location to the center of the earth with the projection of the line on the equatorial plane

Choose the correct answer from the options given below:

[Question ID = 4991][Question Description = 141_67_REE_SEP22_Q41]

1. A - I, B - II, C - III, D - IV [Option ID = 19961]

2. A - IV, B - V, C - II, D - I [Option ID = 19962]

3. A - IV, B - V, C - I, D - II [Option ID = 19963]

4. A - II, B - V, C - I, D - III [Option ID = 19964]

42) Match List I with List II

List I	List II
A. Biodiesel	I. Stover
B. Ethanol	II. 200 to 250 bars
C. Hydrogen	III. Soybean oil

D. CNG	IV. 70-80% CH ₄
	V. Methane steam reformation

Choose the correct answer from the options given below:

[Question ID = 4992][Question Description = 142_67_REE_SEP22_Q42]

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

[Option ID = 19965]

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

[Option ID = 19966]

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

[Option ID = 19967]

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

[Option ID = 19968]

43) Match List I with List II

List I	List II
A. Wheat straw	I. Thermo chemical conversion
B. Saw dust	II. Major crop residue
C. Wood pellet	III. Biochemical conversion
D. Torrified wood pellet	IV. Ideal food stock for briquetting
	V. Higher density than torrified

Choose the correct answer from the options given below:

[Question ID = 4993][Question Description = 143_67_REE_SEP22_Q43]

1. A - I , B - III , C - V , D - I [Option ID = 19969]

2. A - II , B - IV , C - I , D - III [Option ID = 19970]

3. A - II , B - V , C - I , D - IV [Option ID = 19971]

4. A - II, B - IV , C - V , D - I [Option ID = 19972]

44) Match List I with List II

List I	List II
A. KVIC	I. Temperature is high during winter
B. Janata	II. PRAD
C. Deenababdhu	III. 1961
D. Fixed dome	IV. AFPRO
	V. SPRERI

Choose the correct answer from the options given below:

[Question ID = 4994][Question Description = 144_67_REE_SEP22_Q44]

1. A - III, B - II, C - IV, D - I [Option ID = 19973]

2. A - V, B - II, C - IV, D - III [Option ID = 19974]

3. A - III, B - II, C - IV, D - V [Option ID = 19975]

4. A - II, B - III, C - IV, D - I [Option ID = 19976]

45) Match List I with List II

List I	List II
A. Thermo chemical conversion	I. Torrefaction
B. Bio chemical conversion	II. Methane
C. Slow pyrolysis	III. Methane and CO ₂
D. CNG	IV. Syngas
	V. CH ₄ and H ₂

Choose the correct answer from the options given below:

[Question ID = 4995][Question Description = 145_67_REE_SEP22_Q45]

1. A - I, B - III, C - IV, D - II [Option ID = 19977]

2. A - IV, B - III, C - I, D - II [Option ID = 19978]

3. A - I, B - II, C - III, D - V [Option ID = 19979]

4. A - IV, B - V, C - I, D - II [Option ID = 19980]

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

Assertion A: Pyrolysis is a destructive distillation

Reason R: Pyrolysis process does not convert biomass to char, tar, oils and gases

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

[Question ID = 4996][Question Description = 146_67_REE_SEP22_Q46]

1. Both A and R are correct and R is the correct explanation of A [Option ID = 19981]
2. Both A and R are correct but R is NOT the correct explanation of A [Option ID = 19982]
3. A is correct but R is not correct [Option ID = 19983]
4. A is not correct but R is correct [Option ID = 19984]

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

Assertion A: Cross draft gasifiers are suitable for power generation upto 50 kW

Reason R: Gas produced in/by cross draft gasifier passes downward in the annular space around the gasifier that is filled with charcoal

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

[Question ID = 4997][Question Description = 147_67_REE_SEP22_Q47]

1. Both A and R are correct and R is the correct explanation of A [Option ID = 19985]
2. Both A and R are correct but R is NOT the correct explanation of A [Option ID = 19986]
3. A is correct but R is not correct [Option ID = 19987]
4. A is not correct but R is correct [Option ID = 19988]

48) When an engine runs at 400 cycles per min, the volume at beginning of the compression stroke is 0.032 m^3 and at the end of compression stroke is 0.005 m^3 . The work done per cycle is 650 kg.m. What is the compression ratio and power of the four-stroke engine?

[Question ID = 4998][Question Description = 148_67_REE_SEP22_Q48]

1. 6.4:1 and 21.23 kW [Option ID = 19989]
2. 8:1 and 25.25 kW [Option ID = 19990]
3. 6.8:1 and 25.23 kW [Option ID = 19991]
4. 7.5:1 and 22.25 kW [Option ID = 19992]

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

Assertion A: In practice, the efficiency of diesel engines is higher than that of petrol engines.

Reason R: For the same compression ratio, the efficiency of diesel cycle is higher than that of Otto cycle.

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

[Question ID = 4999][Question Description = 149_67_REE_SEP22_Q49]

1. Both A and R are correct and R is the correct explanation of A [Option ID = 19993]
2. Both A and R are correct but R is NOT the correct explanation of A [Option ID = 19994]
3. A is correct but R is not correct [Option ID = 19995]
4. A is not correct but R is correct [Option ID = 19996]

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

Assertion A: The slurry left behind in a biogas plant is used as a manure

Reason R: Slurry contains methane and phosphorus as two main nutrients in it

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

[Question ID = 5000][Question Description = 150_67_REE_SEP22_Q50]

1. Both A and R are correct and R is the correct explanation of A
[Option ID = 19997]
2. Both A and R are correct but R is NOT the correct explanation of A
[Option ID = 19998]
3. A is correct but R is not correct
[Option ID = 19999]
4. A is not correct but R is correct
[Option ID = 20000]

