

# National Testing Agency

<b>Question Paper Name :</b>	Renewable Energy Engineering 17th September Shift 2
<b>Subject Name :</b>	Renewable Energy Engineering
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<b>Total Marks :</b>	480
<b>Display Marks:</b>	Yes

## Renewable Energy Engineering

<b>Group Number :</b>	1
<b>Group Id :</b>	190889117
<b>Group Maximum Duration :</b>	0
<b>Group Minimum Duration :</b>	120
<b>Show Attended Group? :</b>	No
<b>Edit Attended Group? :</b>	No
<b>Break time :</b>	0
<b>Group Marks :</b>	480
<b>Is this Group for Examiner? :</b>	No

## Part A: General Knowledge

<b>Section Id :</b>	190889275
<b>Section Number :</b>	1
<b>Section type :</b>	Online
<b>Mandatory or Optional :</b>	Mandatory



Number of Questions :	20
Number of Questions to be attempted :	20
Section Marks :	80
Enable Mark as Answered Mark for Review and Clear Response :	Yes
Sub-Section Number :	1
Sub-Section Id :	190889315
Question Shuffling Allowed :	Yes

**Question Number : 1 Question Id : 19088913342 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Which of the following is the device used to measure the power and speed of the wind?

1. Avometer
2. Anemometer
3. Airometer
4. Aviontimeter

**Options :**

19088953261. 1
19088953262. 2
19088953263. 3
19088953264. 4

**Question Number : 2 Question Id : 19088913343 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Optical fibre used the concept of which of the following?

1. Reflection
2. Refraction
3. Total internal reflection
4. Total internal refraction



**Options :**

19088953265. 1

19088953266. 2

19088953267. 3

19088953268. 4

**Question Number : 3 Question Id : 19088913344 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Yellow vein mosaic is the viral disease of which of the following plants?

1. Ladyfinger
2. Papaya
3. Sugarcane
4. Banana

**Options :**

19088953269. 1

19088953270. 2

19088953271. 3

19088953272. 4

**Question Number : 4 Question Id : 19088913345 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Which of the following organ(s) is affected by Mumps disease?

1. Entire body
2. Skin
3. Eye
4. Parotid

**Options :**

19088953273. 1

19088953274. 2

19088953275. 3



19088953276. 4

**Question Number : 5 Question Id : 19088913346 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Which of the following is the chemical name of vitamin B<sub>2</sub>?

1. Riboflavin
2. Calciferol
3. Pyridoxin
4. Niacin

**Options :**

19088953277. 1

19088953278. 2

19088953279. 3

19088953280. 4

**Question Number : 6 Question Id : 19088913347 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Which of the following is not the input unit of the computer?

1. Mouse
2. Keyboard
3. Screen
4. Scanner

**Options :**

19088953281. 1

19088953282. 2

19088953283. 3

19088953284. 4

**Question Number : 7 Question Id : 19088913348 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**



**Correct Marks : 4 Wrong Marks : 1**

The digital computer operates on which of the following principle?

1. Measurement
2. Calculation
3. Logical
4. Electrification

**Options :**

19088953285. 1

19088953286. 2

19088953287. 3

19088953288. 4

**Question Number : 8 Question Id : 19088913349 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

The non-cooperation movement of Gandhiji was launched in which of the following year?

1. 1915
2. 1922
3. 1920
4. 1930

**Options :**

19088953289. 1

19088953290. 2

19088953291. 3

19088953292. 4

**Question Number : 9 Question Id : 19088913350 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**



An Islamic revivalist movement named Wahabi movement was founded by which of the following person?

1. Sian Saheb
2. Syed Ahmed
3. Haji Shariat-Allah
4. DaduMian

**Options :**

19088953293. 1

19088953294. 2

19088953295. 3

19088953296. 4

**Question Number : 10 Question Id : 19088913351 Question Type : MCQ Option Shuffling : No**

**Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Which of the following is considered as the “Magna Carta of England Education in India”?

1. Hunter education commission
2. Lord Macaulay’s Minute
3. Wood’s Despatch
4. Thomas Babington Macaulay

**Options :**

19088953297. 1

19088953298. 2

19088953299. 3

19088953300. 4

**Question Number : 11 Question Id : 19088913352 Question Type : MCQ Option Shuffling : No**

**Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**



Which of the following nutrient does not come under the ambit of 'macro-nutrients in Soil Health Card?

1. Nitrogen
2. Zinc
3. Phosphorous
4. Potassium

**Options :**

19088953301. 1

19088953302. 2

19088953303. 3

19088953304. 4

**Question Number : 12 Question Id : 19088913353 Question Type : MCQ Option Shuffling : No**

**Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Cole crops, root crops and legumes come under the ambit of which of the following?

1. Olericulture
2. Pomology
3. Viticulture
4. Arboriculture

**Options :**

19088953305. 1

19088953306. 2

19088953307. 3

19088953308. 4

**Question Number : 13 Question Id : 19088913354 Question Type : MCQ Option Shuffling : No**

**Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**



The study of individual trees, shrubs, vines, and perennial woody plants is known as which of the following?

1. Turf management
2. Arboriculture
3. Pomology
4. Viticulture

**Options :**

19088953309. 1

19088953310. 2

19088953311. 3

19088953312. 4

**Question Number : 14 Question Id : 19088913355 Question Type : MCQ Option Shuffling : No**

**Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

The ministry is implementing MIDH (Mission for Integrated Development of Horticulture) with effect from which of the following year?

1. 2012-13
2. 2019-20
3. 2015-16
4. 2014-15

**Options :**

19088953313. 1

19088953314. 2

19088953315. 3

19088953316. 4

**Question Number : 15 Question Id : 19088913356 Question Type : MCQ Option Shuffling : No**

**Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**



The interaction of soils with living things, particularly plants are well known as which of the following?

1. Edaphology
2. Pedology
3. Soil zoology
4. Pedogenesis

**Options :**

19088953317. 1

19088953318. 2

19088953319. 3

19088953320. 4

**Question Number : 16 Question Id : 19088913357 Question Type : MCQ Option Shuffling : No**

**Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Which of the following systems has also incorporated social aspects in itself?

1. Landscaping
2. Permaculture
3. Horticulture
4. Forest gardening

**Options :**

19088953321. 1

19088953322. 2

19088953323. 3

19088953324. 4

**Question Number : 17 Question Id : 19088913358 Question Type : MCQ Option Shuffling : No**

**Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**



What do you term the phenomenon whereby the specific gene is added to the plant for producing a desirable phenotype?

1. Genetic manipulation
2. Genetic recombination
3. Genetic modification
4. Genetic hybridisation

**Options :**

19088953325. 1

19088953326. 2

19088953327. 3

19088953328. 4

**Question Number : 18 Question Id : 19088913359 Question Type : MCQ Option Shuffling : No  
Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

What is the focus of the participatory plant breeding program?

1. Scientists
2. Plants
3. Environment
4. Farmers

**Options :**

19088953329. 1

19088953330. 2

19088953331. 3

19088953332. 4

**Question Number : 19 Question Id : 19088913360 Question Type : MCQ Option Shuffling : No  
Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**



How do you term the form of agriculture, in which, industrialized production of crops and animal products takes place?

1. Manufactured agriculture
2. Modern agriculture
3. Industrial agriculture
4. Mechanistic agriculture

**Options :**

19088953333. 1

19088953334. 2

19088953335. 3

19088953336. 4

**Question Number : 20 Question Id : 19088913361 Question Type : MCQ Option Shuffling : No  
Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Micro-irrigation fund of Rs. 5,000 crore has been placed with which of the following organization?

1. NABARD
2. IDBI
3. SBI
4. RRBs

**Options :**

19088953337. 1

19088953338. 2

19088953339. 3

19088953340. 4

## **Part B Core : Agricultural Engineering and Technology**

**Section Id :** 190889276

**Section Number :** 2

**Section type :** Online



<b>Mandatory or Optional :</b>	Mandatory
<b>Number of Questions :</b>	50
<b>Number of Questions to be attempted :</b>	50
<b>Section Marks :</b>	200
<b>Enable Mark as Answered Mark for Review and Clear Response :</b>	Yes
<b>Sub-Section Number :</b>	1
<b>Sub-Section Id :</b>	190889316
<b>Question Shuffling Allowed :</b>	Yes

**Question Number : 21 Question Id : 19088913362 Question Type : MCQ Option Shuffling : No**

**Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

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

**Assertion A:** The hammer mill is a machine, which is commonly used for spice grinding.

**Reason R:** The hammer mill works on impact force and causes less heating of spices during grinding.

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

1. Both **A** and **R** are correct and **R** is the correct explanation of **A**
2. Both **A** and **R** are correct but **R** is NOT the correct explanation of **A**
3. **A** is correct but **R** is not correct
4. **A** is not correct but **R** is correct

**Options :**

19088953341. 1

19088953342. 2

19088953343. 3

19088953344. 4

**Question Number : 22 Question Id : 19088913363 Question Type : MCQ Option Shuffling : No**

**Is Question Mandatory : No**



**Correct Marks : 4 Wrong Marks : 1**

Given below are two statements

**Statement I:** The fluid flow in a tube will be laminar, if the Reynold's number is less than 4100.

**Statement II:** The heat transfer will be more, if the fluid flow changes from laminar to turbulent zone.

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

1. Both Statement I and Statement II are true
2. Both Statement I and Statement II are false
3. Statement I is true but Statement II is false
4. Statement I is false but Statement II is true

**Options :**

19088953345. 1

19088953346. 2

19088953347. 3

19088953348. 4

**Question Number : 23 Question Id : 19088913364 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Given below are two statements

**Statement I:** The rubber roll sheller is an equipment commonly used in the modern rice mills.

**Statement II:** The milling of wheat can also be done in the rubber roll sheller.

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

1. Both Statement I and Statement II are true
2. Both Statement I and Statement II are false
3. Statement I is true but Statement II is false
4. Statement I is false but Statement II is true

**Options :**

19088953349. 1

19088953350. 2



19088953351. 3

19088953352. 4

**Question Number : 24 Question Id : 19088913365 Question Type : MCQ Option Shuffling : No  
Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

The moisture content of 35% wet basis for a grain is almost equivalent to

1. 26% dry basis
2. 44% dry basis
3. 54% dry basis
4. 185% dry basis

**Options :**

19088953353. 1

19088953354. 2

19088953355. 3

19088953356. 4

**Question Number : 25 Question Id : 19088913366 Question Type : MCQ Option Shuffling : No  
Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Which of the following does NOT involve heat exchangers ?

1. LSU dryer
2. Boiler
3. Pasteuriser
4. Evaporator

**Options :**

19088953357. 1

19088953358. 2

19088953359. 3

19088953360. 4



**Question Number : 26 Question Id : 19088913367 Question Type : MCQ Option Shuffling : No**

**Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Match List I with List II

List I	List II
A. Sphericity	I. Porosity
B. Volume	II. Dielectric property
C. Microwave	III. Platform scale method
D. Toluene	IV. Shape

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

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

**Options :**

19088953361. 1

19088953362. 2

19088953363. 3

19088953364. 4

**Question Number : 27 Question Id : 19088913368 Question Type : MCQ Option Shuffling : No**

**Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**



Force(s) responsible for size reduction of material in hammer mill includes:

- A. Compression
- B. Shear
- C. Impact
- D. Cutting

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

- 1. A, B and C only
- 2. C only
- 3. A and C only
- 4. B and C only

**Options :**

19088953365. 1

19088953366. 2

19088953367. 3

19088953368. 4

**Question Number : 28 Question Id : 19088913369 Question Type : MCQ Option Shuffling : No**

**Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

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

**Assertion A :** Relative humidity of air reduces with an increase in dry bulb temperature.

**Reason R :** Mass of water present in the air affects relative humidity.

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

- 1. Both **A** and **R** are true and **R** is the correct explanation of **A**
- 2. Both **A** and **R** are true but **R** is NOT the correct explanation of **A**
- 3. **A** is true but **R** is false
- 4. **A** is false but **R** is true

**Options :**



19088953369. 1

19088953370. 2

19088953371. 3

19088953372. 4

**Question Number : 29 Question Id : 19088913370 Question Type : MCQ Option Shuffling : No**  
**Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Which of the following is used for calculation of lateral pressure in deep bins?

1. Janssen formula
2. Rankine formula
3. Henderson equation
4. Plank equation

**Options :**

19088953373. 1

19088953374. 2

19088953375. 3

19088953376. 4

**Question Number : 30 Question Id : 19088913371 Question Type : MCQ Option Shuffling : No**  
**Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Which process destroys only pathogenic organisms?

1. Blanching
2. Pasteurization
3. Sterilization
4. Canning

**Options :**

19088953377. 1

19088953378. 2



19088953379. 3

19088953380. 4

**Question Number : 31 Question Id : 19088913372 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Calculate the time required for ploughing 15 ha of land by a 2-bottom, 50 cm plough, if the speed of the plough is  $5 \text{ km.h}^{-1}$  and time lost in turning is 10 per cent.

1. 11.11 hour
2. 22.22 hour
3. 33.33 hour
4. 44.44 hour

**Options :**

19088953381. 1

19088953382. 2

19088953383. 3

19088953384. 4

**Question Number : 32 Question Id : 19088913373 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

A pair of bullocks exerts 240 kg pull at  $60^\circ$  to the horizontal, while making a V-shaped furrow, 25 cm width and 10 cm deep. Assuming the speed of ploughing  $1.8 \text{ km.h}^{-1}$ , calculate the horse power developed by the bullocks.

1. 0.6 HP
2. 0.8 HP
3. 1.0 HP
4. 1.2 HP

**Options :**

19088953385. 1

19088953386. 2

19088953387. 3

19088953388. 4



**Question Number : 33 Question Id : 19088913374 Question Type : MCQ Option Shuffling : No**  
**Is Question Mandatory : No**  
**Correct Marks : 4 Wrong Marks : 1**

During calibration of seed drill, following data are noted

- a) number of rotation of wheel = 450
- b) seed dropped = 25 kg
- c) number of furrow openers = 8
- d) spacing between furrows = 35 cm
- e) wheel diameter = 25 cm

Calculate the seed rate in  $\text{kg.ha}^{-1}$ .

- 1. 150
- 2. 200
- 3. 250
- 4. 300

**Options :**

- 19088953389. 1
- 19088953390. 2
- 19088953391. 3
- 19088953392. 4

**Question Number : 34 Question Id : 19088913375 Question Type : MCQ Option Shuffling : No**  
**Is Question Mandatory : No**  
**Correct Marks : 4 Wrong Marks : 1**

A four cylinder 4-stroke gas engine has cylinder diameter of 20 cm; stroke-bore ratio is 1.5; clearance volume  $2500 \text{ cm}^3$ ; engine speed 300 rpm; mean effective pressure  $5 \text{ kg.cm}^{-2}$ ; mechanical efficiency 70%. Calculate the IHP of the engine in kW.

- 1. 23.45
- 2. 31.43
- 3. 46.90
- 4. 62.86



**Options :**

- 19088953393. 1
- 19088953394. 2
- 19088953395. 3
- 19088953396. 4

**Question Number : 35 Question Id : 19088913376 Question Type : MCQ Option Shuffling : No**  
**Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

A field sprayer is operated by a tractor at a speed of  $6 \text{ km.h}^{-1}$ . The sprayer boom has 15 nozzles spaced 40 cm apart. Time lost in turning is 8% and tank filling is 7%. Calculate the area covered per hour.

- 1. 1.53 ha
- 2. 1.80 ha
- 3. 3.06 ha
- 4. 3.60 ha

**Options :**

- 19088953397. 1
- 19088953398. 2
- 19088953399. 3
- 19088953400. 4

**Question Number : 36 Question Id : 19088913377 Question Type : MCQ Option Shuffling : No**  
**Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

The diameter of a disc plough is:

- 1. Proportional to the maximum depth of ploughing and inversely proportional to the cosine of the tilt angle.
- 2. Proportional to the depth of ploughing and inversely proportional to the tilt angle
- 3. Proportional to the radius of curvature of the disc as well as cosine of apex angle
- 4. Inversely proportional to the radius of curvature of disc and sine of disc angle.

**Options :**

- 19088953401. 1



19088953402. 2

19088953403. 3

19088953404. 4

**Question Number : 37 Question Id : 19088913378 Question Type : MCQ Option Shuffling : No**

**Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Which of the following statements is NOT correct for a turbocharger fitted to a tractor engine?

1. Turbocharger is a supercharger driven by exhaust gas turbine.
2. Exhaust gas from the engine enter the turbine housing and drive the turbine wheel as well as compressor wheel.
3. Turbocharger increases the density of the air delivered to the engine cylinder thereby allows the engine to burn more fuel to develop more power.
4. Though a turbocharged engine develops more power than a naturally aspired engine, it consumes more fuel per unit power developed.

**Options :**

19088953405. 1

19088953406. 2

19088953407. 3

19088953408. 4

**Question Number : 38 Question Id : 19088913379 Question Type : MCQ Option Shuffling : No**

**Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**



Given below are two statements:

**Statement-I:** Hydraulic system in an agricultural tractor reduce the effort required for a particular function, provide easy power transmission from rotation to translation, easy and cheap overload protection, easy steering, braking and implement lifting etc.

**Statement-II:** Efficiencies of hydraulic systems are comparatively less than that of mechanical systems.

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

1. Statement-I and Statement-II, both are true
2. Statement-I and Statement-II, both are false
3. Statement-I is true but Statement-II is false
4. Statement-I is false but Statement-II is true

**Options :**

19088953409. 1

19088953410. 2

19088953411. 3

19088953412. 4

**Question Number : 39 Question Id : 19088913380 Question Type : MCQ Option Shuffling : No**

**Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Match **List I (Alloying elements in steel)** with **List II (Property conferred on steel by the element)**

List I	List II
Alloying elements in steel	Property conferred on steel by the element
A. Nickle	I. Corrosion resistance
B. Chromium	II. Magnetic permeability
C. Tungsten	III. Heat resistance
D. Silicon	IV. Hardenability

Choose the *correct* answer from the options given below

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



**Options :**

19088953413. 1

19088953414. 2

19088953415. 3

19088953416. 4

**Question Number : 40 Question Id : 19088913381 Question Type : MCQ Option Shuffling : No**

**Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

In a petrol engine, the voltage required to jump spark in a given spark-plug gap does NOT depend on:

1. Compression ratio of engine
2. Indicated mean effective pressure
3. Speed of the engine
4. Size of the engine

**Options :**

19088953417. 1

19088953418. 2

19088953419. 3

19088953420. 4

**Question Number : 41 Question Id : 19088913382 Question Type : MCQ Option Shuffling : No**

**Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**



If soil bulk density is excess of  $1.6 \text{ g.cm}^{-3}$ , it will

- A. Restrict root growth
- B. Enhance aeration
- C. Restrict water movement
- D. Reduce level of porosity
- E. Enhance soil fertility

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

1. A, B and D only
2. A, C and D only
3. A, B and C only
4. A, B and E only

**Options :**

19088953421. 1

19088953422. 2

19088953423. 3

19088953424. 4

**Question Number : 42 Question Id : 19088913383 Question Type : MCQ Option Shuffling : No**

**Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**



Which of the following are the characteristics of an airblast sprayer?

- A. It uses air stream to carry droplets
- B. It is used for spraying orchard crops
- C. It is used for spraying row crops
- D. It uses energy from hydraulic pressure
- E. It uses comparatively larger spray droplets than those of high-pressure sprayers

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

- 1. A, B and E only
- 2. A, C and D only
- 3. A, B and C only
- 4. A, B and D only

**Options :**

19088953425. 1

19088953426. 2

19088953427. 3

19088953428. 4

**Question Number : 43 Question Id : 19088913384 Question Type : MCQ Option Shuffling : No  
Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

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

**Assertion A :** Horizontal axis lift type wind mills are mostly used.

**Reason R :** Lift type wind mills have high tip speed ratio in the range of 13:1.

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

- 1. Both **A** and **R** are true and **R** is the correct explanation of **A**
- 2. Both **A** and **R** are true but **R** is NOT the correct explanation of **A**
- 3. **A** is true but **R** is false
- 4. **A** is false but **R** is true

**Options :**



19088953429. 1

19088953430. 2

19088953431. 3

19088953432. 4

**Question Number : 44 Question Id : 19088913385 Question Type : MCQ Option Shuffling : No**  
**Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Which of the following parameters can be indirectly measured using Linear variable differential transducer (LVDT)?

A. Surface tension

B. Pressure

C. Temperature

D. Acceleration

E. Force

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

1. A, B and D only
2. A, B and C only
3. B, C and D only
4. B, D, and E only

**Options :**

19088953433. 1

19088953434. 2

19088953435. 3

19088953436. 4

**Question Number : 45 Question Id : 19088913386 Question Type : MCQ Option Shuffling : No**  
**Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**



How many frequent weighing scales are there in general-purpose sound measuring equipment?

1. One
2. Two
3. Three
4. Four

**Options :**

19088953437. 1

19088953438. 2

19088953439. 3

19088953440. 4

**Question Number : 46 Question Id : 19088913387 Question Type : MCQ Option Shuffling : No  
Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

The amount of solar radiation striking the earth is called

1. Solar luminosity
2. Solar constant
3. Insolation
4. Solarization

**Options :**

19088953441. 1

19088953442. 2

19088953443. 3

19088953444. 4

**Question Number : 47 Question Id : 19088913388 Question Type : MCQ Option Shuffling : No  
Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**



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

**Assertion A :** Wind turbine machines intended for generating substantial power should have large rotors and located in areas of high wind speeds.

**Reason R :** Maximum power available in the wind varies according to the square of rotor diameter and square of wind speed.

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

1. Both **A** and **R** are true and **R** is the correct explanation of **A**
2. Both **A** and **R** are true but **R** is NOT the correct explanation of **A**
3. **A** is true but **R** is false
4. **A** is false but **R** is true

**Options :**

19088953445. 1

19088953446. 2

19088953447. 3

19088953448. 4

**Question Number : 48 Question Id : 19088913389 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Given below are two statements

**Statement I:** Fuel cell converts chemical energy into electrical energy.

**Statement II:** Fuel cell works on the principle of photo-electric effect.

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

1. Both Statement I and Statement II are true
2. Both Statement I and Statement II are false
3. Statement I is true but Statement II is false
4. Statement I is false but Statement II is true

**Options :**

19088953449. 1

19088953450. 2

19088953451. 3



**Question Number : 49 Question Id : 19088913390 Question Type : MCQ Option Shuffling : No**

**Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Match **List I** with **List II**

List I	List II
A. Fuel cell	I. Light energy into electrical energy
B. Photovoltaic cell	II. Kinetic energy into electrical energy
C. Turbine & Generator	III. Chemical energy into electrical energy
D. Solar cooker	IV. Light energy into heat energy
E. Combustion engine	V. Mechanical energy into electrical energy
F. Generator	VI. Chemical energy into mechanical energy

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

1. A-III, B-I, C-II, D-IV, E-VI, F- V
2. A-I, B-III, C-V, D-VI, E-IV, F-II
3. A-VI, B-IV, C-V, D-I, E-III, F-II
4. A-III, B-IV, C-V, D-I, E-VI, F-II

**Options :**

19088953453. 1

19088953454. 2

19088953455. 3

19088953456. 4

**Question Number : 50 Question Id : 19088913391 Question Type : MCQ Option Shuffling : No**

**Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**



Consider the statements given below:

- A. Biodiesel production from vegetable oils involves anaerobic fermentation
- B. Pyranometers can be used to measure global radiation
- C. Janta biogas plant is a fixed dome biogas plant
- D. Savonius and Darrieus rotors are example of vertical axis wind turbines
- E. Wind vanes are used for measurement of wind speed

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

- 1. A, B and D only
- 2. A, C and E only
- 3. B, C and D only
- 4. A, B, C, D and E only

**Options :**

19088953457. 1

19088953458. 2

19088953459. 3

19088953460. 4

**Question Number : 51 Question Id : 19088913392 Question Type : MCQ Option Shuffling : No  
Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

What is annual average rainfall in India?

- 1. 100 cm
- 2. 119 cm
- 3. 150 cm
- 4. 200 cm

**Options :**

19088953461. 1

19088953462. 2

19088953463. 3

19088953464. 4



**Question Number : 52 Question Id : 19088913393 Question Type : MCQ Option Shuffling : No**  
**Is Question Mandatory : No**  
**Correct Marks : 4 Wrong Marks : 1**

Rain is said to be light rain, if rainfall intensity is:

1.  $< 2.5$  mm/h
2. 2.6-5.0 mm/h
3. 5.1-7.5 mm/h
4. 7.6-10 mm/h

**Options :**

- 19088953465. 1
- 19088953466. 2
- 19088953467. 3
- 19088953468. 4

**Question Number : 53 Question Id : 19088913394 Question Type : MCQ Option Shuffling : No**  
**Is Question Mandatory : No**  
**Correct Marks : 4 Wrong Marks : 1**

Steps of water Erosion are:

- A. Detachment
- B. Transportation
- C. Deposition

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

1. A and B only
2. B and C only
3. A and C only
4. A, B and C

**Options :**

- 19088953469. 1
- 19088953470. 2
- 19088953471. 3



19088953472. 4

**Question Number : 54 Question Id : 19088913395 Question Type : MCQ Option Shuffling : No**  
**Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

The day to day activities of a watershed development project under National Watershed Development Project for Rainfed Areas (NWDPRA) are carried out by:

1. Watershed Development Team
2. Watershed Committee
3. Watershed Association
4. User Group

**Options :**

19088953473. 1

19088953474. 2

19088953475. 3

19088953476. 4

**Question Number : 55 Question Id : 19088913396 Question Type : MCQ Option Shuffling : No**  
**Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Green house structure should be designed for:

- A. Dead Load
- B. Live load
- C. Wind load
- D. Snow load

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

1. A, B and C only
2. B, C and D only
3. A, C and D only
4. A, B, C, and D

**Options :**



19088953477. 1

19088953478. 2

19088953479. 3

19088953480. 4

**Question Number : 56 Question Id : 19088913397 Question Type : MCQ Option Shuffling : No  
Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

One bar pressure is equal to how many psi?

1. 14.5
2. 13.5
3. 4.5
4. 3.5

**Options :**

19088953481. 1

19088953482. 2

19088953483. 3

19088953484. 4

**Question Number : 57 Question Id : 19088913398 Question Type : MCQ Option Shuffling : No  
Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

LEPA irrigation stands for

1. Low Energy Pressurized Application
2. Large Emitter Pressurized Application
3. Low Energy Precision Application
4. Large Emitter Precision Application

**Options :**

19088953485. 1

19088953486. 2

19088953487. 3



**Question Number : 58 Question Id : 19088913399 Question Type : MCQ Option Shuffling : No**  
**Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Match **List I** with **List II**

List I	List II
Dimensionless Number	Ratio
A. Reynold's Number	I. Inertia force to viscous force
B. Euler's Number	II. Inertia force to gravitational force
C. Froude's Number	III. Inertia force to surface tension force
D. Weber's Number	IV. Inertia force to elastic force
	V. Inertia force to pressure force

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

1. A - V, B - II, C - III, D - I
2. A - I, B - V, C - II, D - III
3. A - I, B - III, C - II, D - IV
4. A - V, B - III, C - II, D - I

**Options :**

19088953489. 1

19088953490. 2

19088953491. 3

19088953492. 4

**Question Number : 59 Question Id : 19088913400 Question Type : MCQ Option Shuffling : No**  
**Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**



Considering the efficiency of different irrigation methods, which of the following sequence is correct?

1. Drip > Sprinkler > Furrow > Check basin
2. Drip > Sprinkler > Check basin > Furrow
3. Drip > Furrow > Sprinkler > Check basin
4. Drip > Furrow > Check basin > Sprinkler

**Options :**

19088953493. 1

19088953494. 2

19088953495. 3

19088953496. 4

**Question Number : 60 Question Id : 19088913401 Question Type : MCQ Option Shuffling : No**

**Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Which of the following statements about tensiometers are true?

- A. Tensiometers are used for estimation of soil moisture
- B. Useful limit of most tensiometers is at about 0.85 atmospheres
- C. Tensiometers are not well suited for sandy soils
- D. Tensiometers provide direct measure of the tenacity with which water is held by soils

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

1. A, B and C only
2. A and B only
3. A and C only
4. A, B and D only

**Options :**

19088953497. 1

19088953498. 2

19088953499. 3

19088953500. 4



**Question Number : 61 Question Id : 19088913402 Question Type : MCQ Option Shuffling : No**  
**Is Question Mandatory : No**  
**Correct Marks : 4 Wrong Marks : 1**

Water requirement of crop is sum of

- A. Consumptive use
- B. Application Losses
- C. Special Needs
- D. Effective rainfall

Choose the correct answer form the options given below:

- 1. A, B & D only
- 2. A, B & C only
- 3. B, C & D only
- 4. A, B, C & D only

**Options :**

- 19088953501. 1
- 19088953502. 2
- 19088953503. 3
- 19088953504. 4

**Question Number : 62 Question Id : 19088913403 Question Type : MCQ Option Shuffling : No**  
**Is Question Mandatory : No**  
**Correct Marks : 4 Wrong Marks : 1**

Froude's Number is the ratio of

- 1. Inertial force to the viscous force
- 2. Viscous force to the gravitational force
- 3. Inertial force to the gravitational force
- 4. Gravitational force to the hydrostatic force

**Options :**

- 19088953505. 1
- 19088953506. 2



19088953507. 3

19088953508. 4

**Question Number : 63 Question Id : 19088913404 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

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

**Assertion A:** Flumes are also called as critical flow sections.

**Reason R:** A critical flow occurs along the length of the flumes.

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

1. A. Both **A** and **R** are true and **R** is the correct explanation of **A**
2. B. Both **A** and **R** are true but **R** is NOT the correct explanation of **A**
3. C. **A** is true but **R** is false
4. D. **A** is false but **R** is true

**Options :**

19088953509. 1

19088953510. 2

19088953511. 3

19088953512. 4

**Question Number : 64 Question Id : 19088913405 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**



The following statements are given with respect to unconfined aquifer.

- A. It is not confined by an upper impermeable layer
- B. Water in this aquifer is at higher than atmospheric pressure
- C. The upper surface of the zone of saturation is known as the water table
- D. The level of water in a well constructed in this aquifer is the level of water table
- E. Artesian wells are observed in this aquifer

Choose the *correct* answer from the options given below

- 1. Only A, B & C are correct
- 2. Only A, C, D are correct
- 3. Only B, C & D are correct
- 4. Only A, C & E are correct

**Options :**

19088953513. 1

19088953514. 2

19088953515. 3

19088953516. 4

**Question Number : 65 Question Id : 19088913406 Question Type : MCQ Option Shuffling : No**

**Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

A certain amount of sodium chloride is dissolved in 1 litres of water. When the electrical conductivity was measured, it was found to be 10 dS/m. How much sodium chloride was dissolved in water?

- 1. 12.8 gm
- 2. 6.4 gm
- 3. 0.64 gm
- 4. 64 gm

**Options :**

19088953517. 1

19088953518. 2

19088953519. 3



**Question Number : 66 Question Id : 19088913407 Question Type : MCQ Option Shuffling : No**  
**Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Match **List I** with **List II**

List I	List II
A. Sherman	I. Infiltration rate
B. Darcy's law	II. Spacing of Drains
C. Hooghoudts equation	III. Flow through porous media
D. Green-Ampt equation	IV. Hydrograph
	V. Flood routing

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

1. A -IV , B - V, C - II, D - III
2. A - IV, B - III, C - II, D - I
3. A - V, B - IV, C - III, D - II
4. A - I, B - IV, C - II, D - III

**Options :**

19088953521. 1

19088953522. 2

19088953523. 3

19088953524. 4

**Question Number : 67 Question Id : 19088913408 Question Type : MCQ Option Shuffling : No**  
**Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

The depth (in centimeters) of water drained off from a given area in 24 hours is known as

1. Watershed
2. Hydrograph
3. Aquifer
4. Drainage design rate

**Options :**



19088953525. 1

19088953526. 2

19088953527. 3

19088953528. 4

**Question Number : 68 Question Id : 19088913409 Question Type : MCQ Option Shuffling : No  
Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Which of types of greenhouse is specifically meant for hilly areas?

1. Lean to type
2. Uneven span type
3. Saw tooth type
4. Ridge and furrow type

**Options :**

19088953529. 1

19088953530. 2

19088953531. 3

19088953532. 4

**Question Number : 69 Question Id : 19088913410 Question Type : MCQ Option Shuffling : No  
Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**



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

**Assertion A:** Anticyclones are high pressure areas.

**Reason R:** If the size of the raindrop is more than 8 mm, we call it rainfall.

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

1. Both **A** and **R** are correct and **R** is the correct explanation of **A**
2. Both **A** and **R** are correct but **R** is NOT the correct explanation of **A**
3. **A** is correct but **R** is not correct
4. **A** is not correct but **R** is correct

**Options :**

19088953533. 1

19088953534. 2

19088953535. 3

19088953536. 4

**Question Number : 70 Question Id : 19088913411 Question Type : MCQ Option Shuffling : No**

**Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Consider the following components as part of precision agriculture. Choose the one which does NOT belong to the group.

1. Geographical Positioning System (GPS)
2. Information gathering devices/methodology
3. Decision Support Systems (DSS)
4. Furrow irrigation methods

**Options :**

19088953537. 1

19088953538. 2

19088953539. 3

19088953540. 4



## Part C : Renewable Energy Engineering

Section Id :	190889277
Section Number :	3
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	50
Number of Questions to be attempted :	50
Section Marks :	200
Enable Mark as Answered Mark for Review and Clear Response :	Yes
Sub-Section Number :	1
Sub-Section Id :	190889317
Question Shuffling Allowed :	Yes

Question Number : 71 Question Id : 19088913412 Question Type : MCQ Option Shuffling : No  
Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Given below are two statements

**Statement I:** Aerobic fermentation of organic matter produces  $\text{CO}_2$  and  $\text{NH}_3$  while anaerobic fermentation produces  $\text{CO}_2$  and  $\text{CH}_4$ .

**Statement II:** When the main aim is to render the material hygienic and recover plant nutrients for reuse in fields, the better practice to follow is anaerobic fermentation.

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

1. Both Statement I and Statement II are true
2. Both Statement I and Statement II are false
3. Statement I is true but Statement II is false
4. Statement I is false but Statement II is true

Options :

19088953541. 1

19088953542. 2

19088953543. 3



**Question Number : 72 Question Id : 19088913413 Question Type : MCQ Option Shuffling : No**  
**Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Consider the following statements about UASB

- A. UASB reactor involves high concentration of immobilized bacteria
- B. UASB reactor contains packing medium
- C. In UASB reactor liquid feed enters at the top and effluent passes out at the bottom
- D. Bacteria are retained in the reactor
- E. In UASB design, settling of suspended solids at the bottom is encouraged

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

- 1. A, B and C only
- 2. B, D and E only
- 3. A, C and E only
- 4. A, D and E only

**Options :**

19088953545. 1

19088953546. 2

19088953547. 3

19088953548. 4

**Question Number : 73 Question Id : 19088913414 Question Type : MCQ Option Shuffling : No**  
**Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Liquefaction is dry process of biomass conversion in which liquids are maximized by

- 1. Slow heating of feedstock at comparatively high temperature
- 2. Rapid heating of feedstock at comparatively low temperature
- 3. Slow heating of feedstock at comparatively low temperature
- 4. Rapid heating of feedstock at comparatively high temperature

**Options :**



19088953549. 1

19088953550. 2

19088953551. 3

19088953552. 4

**Question Number : 74 Question Id : 19088913415 Question Type : MCQ Option Shuffling : No  
Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

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

**Assertion A :** Retention period of feedstock in biogas digester should not be less than 2-4 days.

**Reason R :** Methanogenic bacteria multiply at a slower rate and become double in 2-4 days or even in more days.

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

1. Both **A** and **R** are true and **R** is the correct explanation of **A**
2. Both **A** and **R** are true but **R** is NOT the correct explanation of **A**
3. **A** is true but **R** is false
4. **A** is false but **R** is true

**Options :**

19088953553. 1

19088953554. 2

19088953555. 3

19088953556. 4

**Question Number : 75 Question Id : 19088913416 Question Type : MCQ Option Shuffling : No  
Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**



Given below are two statements

**Statement I:** Traditional biogas plants based on cowdung as feedstock cannot be used for water hyacinth.

**Statement II:** Water hyacinth has tendency to float or settle in the bottom of traditional biogas plant.

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

1. Both Statement I and Statement II are true
2. Both Statement I and Statement II are false
3. Statement I is true but Statement II is false
4. Statement I is false but Statement II is true

**Options :**

19088953557. 1

19088953558. 2

19088953559. 3

19088953560. 4

**Question Number : 76 Question Id : 19088913417 Question Type : MCQ Option Shuffling : No**

**Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Arrange the following steps in the correct sequence of methane production through anaerobic digestion:

- A. Hydrolysis
- B. Acidogenesis
- C. Acetogenesis
- D. Methanogenesis

Choose the *correct* answer from the options given below

1. A, B, C, D
2. A, C, B, D
3. C, D, B, A
4. B, C, A, D

**Options :**



19088953561. 1

19088953562. 2

19088953563. 3

19088953564. 4

**Question Number : 77 Question Id : 19088913418 Question Type : MCQ Option Shuffling : No  
Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Consider the following statements about expanded bed and fluidized bed anaerobic reactors

- A. Both expanded bed and fluidized bed reactors use small size particles as support medium for biofilm growth
- B. The support particles in fluidized bed reactor are slightly larger than the expanded bed reactor
- C. The expansion of bed in expanded bed reactor is more than that of fluidized bed reactor
- D. In expanded bed reactor, the expansion of bed is maintained at level required to preserve relative position between support particles inside the bed
- E. In fluidized bed reactor, the particles do not maintain a fixed position inside bed after expansion

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

- 1. A, B and C only
- 2. B, C and E only
- 3. A, D and E only
- 4. A, B, C, D and E only

**Options :**

19088953565. 1

19088953566. 2

19088953567. 3

19088953568. 4

**Question Number : 78 Question Id : 19088913419 Question Type : MCQ Option Shuffling : No  
Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**



Consider the following statements about Arrhenius equation

- A. Arrhenius equation is used to quantify the effect of temperature on biochemical reaction
- B. Arrhenius equation can be used to represent both bacterial decay as well as bacterial synthesis
- C. Arrhenius equation can be used to represent bacterial decay but not the bacterial synthesis
- D. Arrhenius equation can be used to represent bacterial synthesis but not the bacterial decay
- E. Arrhenius equation is linear in nature

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

- 1. B and E only
- 2. A and C only
- 3. A and B only
- 4. D and E only

**Options :**

19088953569. 1

19088953570. 2

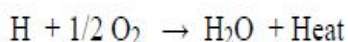
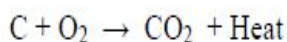
19088953571. 3

19088953572. 4

**Question Number : 79 Question Id : 19088913420 Question Type : MCQ Option Shuffling : No**  
**Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

The net oxygen required for complete combustion of 1 kg of wood (50% Carbon, 43% Oxygen, 6% Hydrogen, and 1% inorganic ash) involving the following combustion reaction will be



- 1. 1333 g
- 2. 1813 g
- 3. 1383 g
- 4. 480 g

**Options :**

19088953573. 1



19088953574. 2

19088953575. 3

19088953576. 4

**Question Number : 80 Question Id : 19088913421 Question Type : MCQ Option Shuffling : No**

**Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Match **List I** with **List II**

<b>List I</b>	<b>List II</b>
<b>Product</b>	<b>Conversion process</b>
A. Briquettes	I. Thermo-chemical conversion
B. Biodiesel	II. Transesterification
C. Biogas	III. Physical conversion
D. Producer gas	IV. Bio-chemical conversion

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

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

**Options :**

19088953577. 1

19088953578. 2

19088953579. 3

19088953580. 4

**Question Number : 81 Question Id : 19088913422 Question Type : MCQ Option Shuffling : No**

**Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**



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

**Assertion A :** Produced gas generated from down draft gasifier is low in tars.

**Reason R :** In down draft gasifier, the products of pyrolysis pass through high temperature oxidation and reduction zone before gas exits from the gasifier.

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

1. Both **A** and **R** are true and **R** is the correct explanation of **A**
2. Both **A** and **R** are true but **R** is NOT the correct explanation of **A**
3. **A** is true but **R** is false
4. **A** is false but **R** is true

**Options :**

19088953581. 1

19088953582. 2

19088953583. 3

19088953584. 4

**Question Number : 82 Question Id : 19088913423 Question Type : MCQ Option Shuffling : No**  
**Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Which of the following statements regarding CI engine and SI engine is most appropriate?

1. Both can run completely on biogas
2. Only SI engine can run completely on biogas while CI engine needs modification to run on biogas
3. Only CI engine can run completely on biogas while SI engine needs modification to run on biogas
4. Neither CI engine nor SI engine can run on biogas

**Options :**

19088953585. 1

19088953586. 2

19088953587. 3

19088953588. 4

**Question Number : 83 Question Id : 19088913424 Question Type : MCQ Option Shuffling : No**



**Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Given below are two statements

**Statement I:** Vegetable oils can be converted into biodiesel by a process of transesterification.

**Statement II:** During biodiesel production glycerine remains on upper side and ester on lower side forming two distinct layers.

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

1. Both Statement I and Statement II are true
2. Both Statement I and Statement II are false
3. Statement I is true but Statement II is false
4. Statement I is false but Statement II is true

**Options :**

19088953589. 1

19088953590. 2

19088953591. 3

19088953592. 4

**Question Number : 84 Question Id : 19088913425 Question Type : MCQ Option Shuffling : No**

**Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Given below are two statements

**Statement I:** Efficiency of power generation from biomass in coal fired power plants during co-firing is lesser than the efficiency of dedicated 100% biomass power plants.

**Statement II:** Biomass co-firing reduces greenhouse gas emissions from coal-fired power plants.

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

1. Both Statement I and Statement II are correct
2. Both Statement I and Statement II are incorrect
3. Statement I is correct but Statement II is incorrect
4. Statement I is incorrect but Statement II is correct

**Options :**



19088953593. 1

19088953594. 2

19088953595. 3

19088953596. 4

**Question Number : 85 Question Id : 19088913426 Question Type : MCQ Option Shuffling : No  
Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

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

**Assertion A :** Ethanol is most suitable for use in spark-ignition engines, while biodiesel is most suitable for use in compression-ignition engines.

**Reason R :** Ethanol has high octane number while biodiesel has high cetane number.

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

1. Both **A** and **R** are true and **R** is the correct explanation of **A**
2. Both **A** and **R** are true but **R** is NOT the correct explanation of **A**
3. **A** is true but **R** is false
4. **A** is false but **R** is true

**Options :**

19088953597. 1

19088953598. 2

19088953599. 3

19088953600. 4

**Question Number : 86 Question Id : 19088913427 Question Type : MCQ Option Shuffling : No  
Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**



Which of the following crop is used majorly for ethanol fuel production in USA and Brazil?

1. Corn in USA and Sugarcane in Brazil
2. Sugarcane in USA and Corn in Brazil
3. Sugarcane in both USA and Brazil
4. Corn in both USA and Brazil

**Options :**

19088953601. 1

19088953602. 2

19088953603. 3

19088953604. 4

**Question Number : 87 Question Id : 19088913428 Question Type : MCQ Option Shuffling : No**  
**Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

The correct sequence of steps for ethanol production from lignocellulosic material is

- A. Hydrolysis
- B. Pretreatment
- C. Distillation
- D. Fermentation

Choose the *correct* answer from the options given below

1. A, B, C, D
2. B, A, C, D
3. B, C, D, A
4. B, A, D, C

**Options :**

19088953605. 1

19088953606. 2

19088953607. 3

19088953608. 4



**Question Number : 88 Question Id : 19088913429 Question Type : MCQ Option Shuffling : No**

**Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Which of the following is true regarding biodiesel production process?

1. Three triglyceride molecules react with one methanol molecule to produce three molecules of glycerol and one ester molecule
2. Three triglyceride molecules react with three methanol molecules to produce one molecule of glycerol and one ester molecule
3. One triglyceride molecule reacts with one methanol molecule to produce three molecules of glycerol and three ester molecules
4. One triglyceride molecule reacts with three methanol molecules to produce one molecule of glycerol and three ester molecules

**Options :**

19088953609. 1

19088953610. 2

19088953611. 3

19088953612. 4

**Question Number : 89 Question Id : 19088913430 Question Type : MCQ Option Shuffling : No**

**Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Gasohol contains

1. 90% ethanol, 10% gasoline
2. 50% ethanol, 50% gasoline
3. 75% ethanol, 25% gasoline
4. 10% ethanol, 90% gasoline

**Options :**

19088953613. 1

19088953614. 2

19088953615. 3

19088953616. 4

**Question Number : 90 Question Id : 19088913431 Question Type : MCQ Option Shuffling : No**



**Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Consider the following statements

- A. Rayleigh scattering of solar radiation takes place when size of particles is much smaller than the wavelength of incident light
- B. Total radiation is lesser than global radiation
- C. Pyroheliometer is used to measure global solar radiation
- D. Angular distance of the sun's rays to the north or south of the equator is known as Zenith angle
- E. On equinox days, the sun's declination is  $90^0$

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

- 1. A only
- 2. C only
- 3. A, B and E only
- 4. C, D and E only

**Options :**

19088953617. 1

19088953618. 2

19088953619. 3

19088953620. 4

**Question Number : 91 Question Id : 19088913432 Question Type : MCQ Option Shuffling : No**

**Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**



Given below are two statements

**Statement I:** Flat plate solar collectors are used for higher temperature applications ( $> 100^{\circ}\text{C}$ ).

**Statement II:** For solar energy applications using flat plate collectors, the parameter to be chosen is global radiation.

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

1. Both Statement I and Statement II are true
2. Both Statement I and Statement II are false
3. Statement I is true but Statement II is false
4. Statement I is false but Statement II is true

**Options :**

19088953621. 1

19088953622. 2

19088953623. 3

19088953624. 4

**Question Number : 92 Question Id : 19088913433 Question Type : MCQ Option Shuffling : No**  
**Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Consider the following statements related to solar pond

- A. Solar pond is actually a large area solar collector
- B. In solar pond, the upper layer acts as heat storage zone
- C. In solar pond, hot water is removed continuously from the top
- D. In solar pond, the salt is added to maintain a vertical temperature difference with maximum temperature at the top and minimum at the bottom
- E. Among the three zones of salt gradient in solar pond, middle and lower zone are thicker than upper zone

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

1. B, C and E only
2. A and E only
3. B and D only
4. A, B, C, D and E only



**Options :**

19088953625. 1

19088953626. 2

19088953627. 3

19088953628. 4

**Question Number : 93 Question Id : 19088913434 Question Type : MCQ Option Shuffling : No****Is Question Mandatory : No****Correct Marks : 4 Wrong Marks : 1**

Match List I with List II

List I	List II
A. Solar module	I. Essentially consists of a number of solar cells placed in a glass-covered housing
B. Solar tower	II. Each solar collector has its own absorber
C. Solar farm	III. Solar thermal power generation system essentially consists of number of heliostats
D. Solar still	IV. An optical system for obtaining high temperature
E. Solar furnace	V. Desalinates saline water

Choose the correct answer from the options given below:

1. A-II, B-IV, C-III, D-I, E-V
2. A-III, B-V, C-I, D- IV, E- II
3. A-IV, B- III, C-V, D-II, E-I
4. A-I, B-III, C-II, D-V, E-IV

**Options :**

19088953629. 1

19088953630. 2

19088953631. 3

19088953632. 4

**Question Number : 94 Question Id : 19088913435 Question Type : MCQ Option Shuffling : No****Is Question Mandatory : No**



**Correct Marks : 4 Wrong Marks : 1**

Consider the following statements about *summer green house* and *winter green house*

- A. In winter greenhouse, the south wall is usually made of glass
- B. In winter greenhouse, windows are provided in North and South walls for ventilation
- C. In summer greenhouse, the south wall is covered by Insulation
- D. In summer greenhouse, windows are provided in North and South walls
- E. Summer green houses are constructed to catch enough of the incoming heat from the sun

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

- 1. A, B, C, D and E only
- 2. A, C and D only
- 3. C, D and E only
- 4. B, C and E only

**Options :**

19088953633. 1

19088953634. 2

19088953635. 3

19088953636. 4

**Question Number : 95 Question Id : 19088913436 Question Type : MCQ Option Shuffling : No**

**Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

What will be power generated from an arrangement having 244 solar cells connected in series (i.e. in a string) and 10 such solar strings connected in parallel? (Assuming operating voltage of each photo-voltaic cell as 0.45 V and current output as 1.08 A)

- 1. 10.8 kW
- 2. 1.19 kW
- 3. 5.4 kW
- 4. 19.1 kW

**Options :**

19088953637. 1

19088953638. 2



19088953639. 3

19088953640. 4

**Question Number : 96 Question Id : 19088913437 Question Type : MCQ Option Shuffling : No  
Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Contours of constant average wind velocity are called

1. Isodynes
2. Isohyets
3. Isobars
4. Isovents

**Options :**

19088953641. 1

19088953642. 2

19088953643. 3

19088953644. 4

**Question Number : 97 Question Id : 19088913438 Question Type : MCQ Option Shuffling : No  
Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**



Consider the following statements about horizontal and vertical axis wind turbine

- A. In horizontal axis wind turbines, the dominant driving force is lift
- B. Vertical axis machines require yaw control for proper operation
- C. Savonius rotor and Darrieus rotor are vertical axis machines
- D. Cup anemometer rotates by using the drag force
- E. For the Darrieus rotor, the driving wind force is lift

Choose the *correct* answer from the options given below

- 1. A, B, C and D Only
- 2. A, B and C only
- 3. B, C, D and E only
- 4. A, C, D and E only

**Options :**

19088953645. 1

19088953646. 2

19088953647. 3

19088953648. 4

**Question Number : 98 Question Id : 19088913439 Question Type : MCQ Option Shuffling : No  
Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

If the diameter ( $d$ ) of horizontal axis rotor is doubled and wind speed ( $v$ ) is halved, the available wind power ( $P_a$ ) will

- 1. Remain same
- 2. Increase by two times
- 3. Reduce to half
- 4. Increase by four times

**Options :**

19088953649. 1

19088953650. 2

19088953651. 3



**Question Number : 99 Question Id : 19088913440 Question Type : MCQ Option Shuffling : No**  
**Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Consider the following statements:

**Statement 1:** Betz coefficient represents the theoretical maximum fraction of power in a wind stream that can be extracted and has a value of 0.593

**Statement 2:** Power coefficient represents the fraction of the power in the wind that is extracted by the rotor and can exceed 0.593

Choose the correct answer from the options given below:

1. Both Statement I and Statement II are true
2. Both Statement I and Statement II are false
3. Statement I is true but Statement II is false
4. Statement I is false but Statement II is true

**Options :**

19088953653. 1

19088953654. 2

19088953655. 3

19088953656. 4

**Question Number : 100 Question Id : 19088913441 Question Type : MCQ Option Shuffling : No**  
**Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**



Consider the following statements

**Statement I:** Blade element theory describes thrust and torque on an annular section of the rotor as a function of the axial and angular induction factors.

**Statement II:** Momentum theory describes thrust and torque on an annular rotor section as a function of the flow angles at the blades and airfoil characteristics.

Choose the correct answer from the options given below:

1. Both Statement I and Statement II are true
2. Both Statement I and Statement II are false
3. Statement I is true but Statement II is false
4. Statement I is false but Statement II is true

**Options :**

19088953657. 1

19088953658. 2

19088953659. 3

19088953660. 4

**Question Number : 101 Question Id : 19088913442 Question Type : MCQ Option Shuffling : No**

**Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

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

**Assertion A:** Downwind turbines are typically noisier than their upwind counterparts.

**Reason R:** Downwind rotors encounter tower shadow once per revolution.

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

1. Both **A** and **R** are true and **R** is the correct explanation of **A**
2. Both **A** and **R** are true but **R** is NOT the correct explanation of **A**
3. **A** is true but **R** is false
4. **A** is false but **R** is true

**Options :**

19088953661. 1

19088953662. 2



19088953663. 3

19088953664. 4

**Question Number : 102 Question Id : 19088913443 Question Type : MCQ Option Shuffling : No  
Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

According to Michaelis- Menten approach, product releasing step

1. is much slower than the reversible reaction and slower step determines the reaction rate
2. is much faster than the reversible reaction and faster step determines the reaction rate
3. is much slower than the reversible reaction and faster step determines the reaction rate
4. is much faster than the reversible reaction and slower step determines the reaction rate

**Options :**

19088953665. 1

19088953666. 2

19088953667. 3

19088953668. 4

**Question Number : 103 Question Id : 19088913444 Question Type : MCQ Option Shuffling : No  
Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

The correct sequence of bacterial growth curve is

1. Log phase-lag phase-accelerated growth phase-decelerated growth phase-death-stationary phase
2. Accelerated growth phase-decelerated growth phase-Log phase-Lag phase- death-stationary phase
3. Lag phase-accelerated growth phase-Log phase- decelerated growth phase - stationary phase-death
4. Stationary growth phase- accelerated growth phase-Log phase- decelerated growth phase-death

**Options :**

19088953669. 1

19088953670. 2

19088953671. 3



19088953672. 4

**Question Number : 104 Question Id : 19088913445 Question Type : MCQ Option Shuffling : No**  
**Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Consider the following statements:

- A. Thermal death of micro-organisms at a particular temperature can be described by zero order kinetics
- B. Fick's law is related to molecular diffusion in liquids
- C. Fermenter is also a bioreactor
- D. In airlift fermenters mixing is accomplished without any mechanical agitation
- E. There should be minimum number of openings in the bioreactor to maintain sterility

Choose the *correct* answer from the options given below

- 1. A, B, C, D only
- 2. B, C, D, E only
- 3. A, C, E only
- 4. B, D, E only

**Options :**

19088953673. 1

19088953674. 2

19088953675. 3

19088953676. 4

**Question Number : 105 Question Id : 19088913446 Question Type : MCQ Option Shuffling : No**  
**Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**



A 10,000 litre of liquid bioreactor contains  $5 \text{ g.l}^{-1}$  of growing cells with specific rate of  $\text{O}_2$  consumption ( $q_{\text{O}_2} = 20 \text{ mmol O}_2 / \text{g cells-h}$ ). The oxygen uptake rate (OUR) will be

1. 50000 mmol  $\text{O}_2$  / (g cells-h)
2. 200 mmol  $\text{O}_2$  / (g cells-h)
3. 10000 mmol  $\text{O}_2$  / (g cells-h)
4. 100 mmol  $\text{O}_2$  / (g cells-h)

**Options :**

19088953677. 1

19088953678. 2

19088953679. 3

19088953680. 4

**Question Number : 106 Question Id : 19088913447 Question Type : MCQ Option Shuffling : No**  
**Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Given below are two statements

**Statement 1:** If the final concentration is less than the optimum cell concentration ( $C_{x,\text{opt}}$ ) two fermenters in series are better than one fermenter.

**Statement 2:** Two continuous stirred-tank fermenters (CSTFs) connected in series require more residence time than one continuous stirred-tank fermenter (CSTF) does.

Choose the correct answer from the options given below:

1. Both Statement I and Statement II are true
2. Both Statement I and Statement II are false
3. Statement I is true but Statement II is false
4. Statement I is false but Statement II is true

**Options :**

19088953681. 1

19088953682. 2

19088953683. 3

19088953684. 4

**Question Number : 107 Question Id : 19088913448 Question Type : MCQ Option Shuffling : No**



**Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

What will be the total power from a wind turbine of 100 m diameter, if the total power density in wind stream is  $500 \text{ W.m}^{-2}$  and maximum efficiency is 40 per cent?

1. 6280 kW
2. 2000 kW
3. 1570 kW
4. 1250 kW

**Options :**

19088953685. 1

19088953686. 2

19088953687. 3

19088953688. 4

**Question Number : 108 Question Id : 19088913449 Question Type : MCQ Option Shuffling : No**

**Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Given below are two statements

**Statement 1:** Variable speed constant frequency (VSCF) wind energy conversion system require pitch control system while constant speed constant frequency (CSCF) wind energy conversion system does not require pitch control system.

**Statement II:** Stand-alone wind electric energy system does not need storage facility while energy storage is necessary with grid connected wind energy system.

Choose the correct answer from the options given below:

1. Both Statement I and Statement II are true
2. Both Statement I and Statement II are false
3. Statement I is true but Statement II is false
4. Statement I is false but Statement II is true

**Options :**

19088953689. 1

19088953690. 2

19088953691. 3



19088953692. 4

**Question Number : 109 Question Id : 19088913450 Question Type : MCQ Option Shuffling : No**  
**Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

What will be the overall efficiency of a diesel power station having fuel consumption of 0.30 kg per kWh and the calorific value of fuel being 10,000 kcal/kg?

1. 22 %
2. 35 %
3. 48%
4. 61%

**Options :**

19088953693. 1

19088953694. 2

19088953695. 3

19088953696. 4

**Question Number : 110 Question Id : 19088913451 Question Type : MCQ Option Shuffling : No**  
**Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**



Consider the following statements

- A. In nuclear reactor, the controller rods are made of Cadmium and moderator rods are made of Graphite
- B. In nuclear reactor, the control rod slows down the neutrons while the moderator rod regulates the supply of neutrons
- C. Impulse turbines are used for high heads while reaction turbines are used for low and medium heads
- D. Surge tank and penstock are components of hydro-electric power station system
- E. The overall efficiency of nuclear power plant is greater than hydroelectric power plant

Choose the correct answer from the options given below:

- 1. A, C and D only
- 2. B, C and E only
- 3. A, B and E only
- 4. A, B and D only

**Options :**

19088953697. 1

19088953698. 2

19088953699. 3

19088953700. 4

**Question Number : 111 Question Id : 19088913452 Question Type : MCQ Option Shuffling : No**

**Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**



Consider the following statements

**Statement I:** Neap tides have maximum tidal range while spring tides have minimum tidal range.

**Statement II:** Tidal power is independent of the tidal range.

Choose the correct answer from the options given below:

1. Both Statement I and Statement II are true
2. Both Statement I and Statement II are false
3. Statement I is true but Statement II is false
4. Statement I is false but Statement II is true

**Options :**

19088953701. 1

19088953702. 2

19088953703. 3

19088953704. 4

**Question Number : 112 Question Id : 19088913453 Question Type : MCQ Option Shuffling : No**

**Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

The tool used for performance assessment and logical evaluation of avenues for improvement in Energy management and audit is

1. Monitoring and verification
2. Energy pricing
3. Energy budgeting
4. Bench marking

**Options :**

19088953705. 1

19088953706. 2

19088953707. 3

19088953708. 4

**Question Number : 113 Question Id : 19088913454 Question Type : MCQ Option Shuffling : No**



**Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Match the following and choose the correct answer from the options given below.

A. Energy Index	I. Energy consumption per unit of Gross Domestic Product (GDP)
B. Energy performance	II. An efficiency parameter to determine the energy that would have been required to produce this year's production output if the plant had operated in the same way as it did in the reference year.
C. Production factor	III. Ratio of total energy expenditure to the total production output e.g. kWh/MT of clinker in cement plant
D. Energy intensity	IV. A measure of whether a plant is now using more or less energy to manufacture its products than it did in the past

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

**Options :**

19088953709. 1

19088953710. 2

19088953711. 3

19088953712. 4

**Question Number : 114 Question Id : 19088913455 Question Type : MCQ Option Shuffling : No**

**Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

If the measured line voltage are 462,463, and 455 volts in 3-phase system, the voltage unbalance (in percent) is

1.  $(2/460) \times 100$
2.  $(3/460) \times 100$
3.  $(5/460) \times 100$
4. Zero

**Options :**

19088953713. 1

19088953714. 2

19088953715. 3



19088953716. 4

**Question Number : 115 Question Id : 19088913456 Question Type : MCQ Option Shuffling : No**  
**Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Consider the following statements

- A. Power Factor is the cosine of the phase angle between current and voltage
- B. Power Factor is the ratio of true power to apparent power
- C. True power is the product of the current and voltage of the circuit.
- D. In case of inductive loads, current lags the voltage and thus power factor is lagging
- E. Apparent power and reactive power are expressed in kVA while real power is expressed in kW

Choose the correct answer from the options given below:

- 1. A, B, D and E only
- 2. A, B, C and D only
- 3. B, C, D and E only
- 4. A, B, C and E only

**Options :**

19088953717. 1

19088953718. 2

19088953719. 3

19088953720. 4

**Question Number : 116 Question Id : 19088913457 Question Type : MCQ Option Shuffling : No**  
**Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**



Consider the following statements

**Statement I:** Payback period does not take into consideration time value of money.

**Statement II:** Net present value takes into consideration time value of money.

Choose the correct answer from the options given below:

1. Both Statement I and Statement II are true
2. Both Statement I and Statement II are false
3. Statement I is true but Statement II is false
4. Statement I is false but Statement II is true

**Options :**

19088953721. 1

19088953722. 2

19088953723. 3

19088953724. 4

**Question Number : 117 Question Id : 19088913458 Question Type : MCQ Option Shuffling : No  
Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Consider the following statements about Internal Rate of Return (IRR) for a project

- A. IRR is the discount rate at which net present value (NPV) of investment is zero
- B. IRR does not distinguish between investing and borrowing
- C. The project is worth to accept when required return exceeds IRR
- D. There can be multiple IRR associated with the project

Choose the correct answer from the options given below:

1. A, B and C only
2. B, C and D only
3. A, C and D only
4. A, B and D only

**Options :**

19088953725. 1

19088953726. 2



19088953727. 3

19088953728. 4

**Question Number : 118 Question Id : 19088913459 Question Type : MCQ Option Shuffling : No  
Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Arrange the following operations of various elements of the project management life cycle in the correct sequence.

A. Need identification

B. Initiation

C. Planning

D. Executing

E. Controlling

F. Closing out

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

1. A, B, C, D, E, F
2. A, C, D, B, E, F
3. B, A, C, E, D, F
4. B, A, D, C, E, F

**Options :**

19088953729. 1

19088953730. 2

19088953731. 3

19088953732. 4

**Question Number : 119 Question Id : 19088913460 Question Type : MCQ Option Shuffling : No  
Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**



The technique used for scheduling the tasks and tracking of the progress of energy management projects is called

1. CPM
2. Gantt chart
3. CUSUM
4. PERT

**Options :**

19088953733. 1

19088953734. 2

19088953735. 3

19088953736. 4

**Question Number : 120 Question Id : 19088913461 Question Type : MCQ Option Shuffling : No**  
**Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

A new small cogeneration plant installation is expected to reduce a company's annual energy bill by Rs.4,86,000. If the capital cost of the new boiler installation is Rs.22,20,000 and the annual maintenance and operating costs are Rs. 42,000, the expected payback period for the project can be

1. 3 years
2. 5 years
3. 7 years
4. 9 years

**Options :**

19088953737. 1

19088953738. 2

19088953739. 3

19088953740. 4