BCECE 2026 May 31 (Agriculture)

Question Paper (Memory-Based) With Solutions PDF

Conducted by Bihar Combined Entrance Competitive Examination Board (BCECEB)

General Instructions

(i) The question paper will consist of 100 Multiple Choice Questions (MCQs).

(ii) The duration of the Agriculture examination will be 1 hour 30 minutes (90 minutes).

(iii) The examination will be conducted in offline (pen-and-paper/OMR-based) mode.

(iv) For every correct answer, 4 marks will be awarded and for every incorrect answer, 1 mark will be deducted as negative marking.

1. When was ICAR established?

(A) 1880
(B) 1905
(C) 1929
(D) 1970

Correct Answer: (C) 1929

Solution:

Step 1: Understanding the Concept:

The Indian Council of Agricultural Research (ICAR) is an autonomous apex national body responsible for coordinating, guiding, and managing research and education in agriculture, including horticulture, fisheries, and animal sciences in India.

Step 2: Detailed Explanation:

ICAR was established on 16 July 1929 as a registered society under the Societies Registration Act, 1860, following the recommendations of the Royal Commission on Agriculture. It was

originally named the Imperial Council of Agricultural Research and was subsequently renamed after India gained independence. It is one of the largest national agricultural systems in the world, headquartered in New Delhi.

Step 3: Final Answer

ICAR was established in the year 1929.

Quick Tip: To remember this important date, note that July 16 is officially celebrated across the country every year as 'ICAR Foundation Day'.

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2. How many agricultural universities are currently operational in India?

(A) 48

(B) 49

(C) 50

(D) None of these

Correct Answer: (D) None of these

Solution:

Step 1: Understanding the Concept:

The higher agricultural education network in India is vast and dynamic, expanding continuously to meet the demands of human resource development in the primary sector. It comprises State Agricultural Universities (SAUs), Deemed Universities (DUs), Central Agricultural Universities (CAUs), and Central Universities with agricultural faculties.

Step 2: Detailed Explanation:

According to the latest official records maintained by the Indian Council of Agricultural Research (ICAR), the current number of operational agricultural universities in India is well over 74. This includes more than 63 State Agricultural Universities, 3 Central Agricultural Universities, 4 Deemed Universities, and several Central Universities with dedicated agricultural faculties. Because this comprehensive number far exceeds the specific

limits of options (A), (B), and (C), 'None of these' is the accurate choice.

Step 3: Final Answer

The number of active agricultural universities exceeds the given options, hence the answer is None of these.

Quick Tip: India's agricultural education network is one of the largest in the world, with the actual total number hovering around 74 to 75 functional universities.

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3. Where is the first agricultural university of India located?

(A) Pusa

(B) New Delhi

(C) Pantnagar

(D) Sabour

Correct Answer: (C) Pantnagar

Solution:

Step 1: Understanding the Concept:

Following its independence, India adopted the landmark land-grant pattern of education from the United States to integrate technical classroom teaching, experimental laboratory research, and active rural extension programs.

Step 2: Detailed Explanation:

The first agricultural university in India was inaugurated by Pandit Jawaharlal Nehru on 17 November 1960 at Pantnagar, which was then a part of Uttar Pradesh and is currently located in the state of Uttarakhand. It was initially named the Uttar Pradesh Agricultural University (UPAU) and was later rechristened as the Govind Ballabh Pant University of Agriculture and Technology (GBPUAT) in 1972 to honor the legendary statesman. This university became the prominent epicentre of India's Green Revolution.

Step 3: Final Answer

The first agricultural university of India is located at Pantnagar.

Quick Tip: Remember the historical link: Pantnagar University is widely recognized as the "Cradle of the Green Revolution" in India because of its massive impact on domestic seed development and food crop yields.

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4. How many national-level research centres are there in Bihar?

(A) One

(B) Two

(C) Three

(D) Four

Correct Answer: (A) One

Solution:

Step 1: Understanding the Concept:

The Indian Council of Agricultural Research (ICAR) establishes diverse categories of specialized entities, including Research Institutes, Central Universities, Directorates, and National Research Centres (NRCs), to advance targeted commodity research across strategic geographical zones.

Step 2: Detailed Explanation:

Under the official classification system of ICAR, Bihar hosts exactly one standalone National Research Centre (NRC): the ICAR-National Research Centre for Litchi (NRCL), located at Mushahari in Muzaffarpur. Other prominent ICAR institutions active within the state, such as the ICAR Research Complex for Eastern Region (ICAR-RCER) in Patna and the Agricultural Technology Application Research Institute (ATARI) in Patna, fall structurally under the category of primary regional research institutes and technology application networks rather than separate national research centres. Therefore, the total count of National Research Centres is one.

Step 3: Final Answer

There is only one dedicated national-level research centre (NRC) located in Bihar.

Quick Tip: To avoid confusion in competitive exams, distinguish between regular ICAR Institutes and NRCs. Bihar's sole standalone NRC is exclusively dedicated to Litchi research in Muzaffarpur.

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5. Land improvement provides -

(A) Favorable condition for crop production

(B) Crop growing practices

(C) Both a & b

(D) None of these

Correct Answer: (A) Favorable condition for crop production

Solution:

Step 1: Understanding the Concept:

Land improvement encompasses long-term physical, structural, and biochemical alterations made to the soil surface and subsurface topology. The primary objective is to enhance the soil's natural productive capacity, structural integrity, and long-term sustainability for cultivation.

Step 2: Detailed Explanation:

Land improvement operations include vital structural and management practices such as land leveling, constructing proper drainage channels, terrace farming on slopes, and executing soil reclamation for saline or acidic plots. These alterations directly optimize soil aeration, water retention, and root penetration, creating a highly favorable condition for crop production. Conversely, "Crop growing practices" (Option B) refer specifically to agronomic actions and cultivation choices like crop rotation, sowing techniques, and weeding schedules, which fall under crop management rather than physical land transformation. Therefore, the immediate outcome of land improvement is the establishment of favorable growing environments.

Step 3: Final Answer

Land improvement provides a favorable condition for crop production.

Quick Tip: Remember: Land improvement modifies the physical environment (the soil matrix), while agronomic practices modify how the plant is managed within that modified environment.

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6. White smoke indicates -

(A) Lubricating oil burning in cylinder

(B) Presence of water in fuel

(C) Excessive load on engine

(D) Rich fuel-air mixture

Correct Answer: (B) Presence of water in fuel

Solution:

Step 1: Understanding the Concept:

Exhaust smoke coloration serves as an essential diagnostic indicator for internal combustion engines, directly signaling specific combustion abnormalities, fuel contamination, or structural wear within the engine block.

Step 2: Detailed Explanation:

White smoke emerges from the exhaust system when water or raw unburnt fuel vaporizes inside the high-temperature combustion chamber. The most frequent cause is the presence of water within the fuel supply line or coolant leaking into the cylinders via a blown head gasket. For comparison:

- Blue or grey smoke indicates that lubricating oil is slipping past worn piston rings and burning inside the cylinder.
- Black smoke indicates an overly rich fuel-air mixture, inadequate air supply, or excessive structural load on the engine, causing incomplete carbon combustion.

Step 3: Final Answer

The discharge of white smoke indicates the presence of water or moisture in the fuel system.

Quick Tip: Engine Smoke Summary: - White Smoke: Water/moisture in fuel or coolant leak. - Black Smoke: Incomplete combustion / Excess fuel (Rich mixture). - Blue Smoke: Engine oil burning in the cylinder.

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7. In a two-stroke engine, the power stroke occurs compared to a four-stroke engine -

(A) Double

(B) Same

(C) Triple

(D) Four times

Correct Answer: (A) Double

Solution:

Step 1: Understanding the Concept:

In internal combustion engines, the term "power stroke" refers to the specific stage of the engine cycle where the ignited fuel-air mixture expands, forcing the piston downward and generating mechanical power. The frequency of this power stroke relative to crankshaft rotations distinguishes two-stroke engines from four-stroke engines.

Step 2: Detailed Explanation:

An internal combustion engine requires four distinct operations to complete one full thermodynamic cycle: Intake, Compression, Power, and Exhaust.

- In a four-stroke engine, these four operations require four separate piston movements (strokes), which correspond to two full rotations (720°) of the crankshaft. Thus, it produces 1 power stroke for every 2 crankshaft revolutions.
- In a two-stroke engine, these four functions are compressed into just two piston movements (strokes) by combining intake/exhaust and compression/power stages. This happens during one full rotation (360°) of the crankshaft. Thus, it produces 1 power stroke for every 1 crankshaft revolution.

When compared over an equal number of crankshaft revolutions, a two-stroke engine delivers a power stroke twice as often as a four-stroke engine, which means the power stroke occurs

double the number of times.

Step 3: Final Answer

The power stroke in a two-stroke engine occurs double the number of times compared to a four-stroke engine for the same number of crankshaft revolutions.

Quick Tip: Engine Comparison Rule: - Two-stroke engine: 1 Power Stroke = 1 Revolution of Crankshaft (360°). - Four-stroke engine: 1 Power Stroke = 2 Revolutions of Crankshaft (720°). Therefore, at any given RPM, a two-stroke engine fires twice (double) as frequently.

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8. Seed drill is used for sowing which crop?

(A) Wheat

(B) Maize

(C) Sugarcane

(D) Potato

Correct Answer: (A) Wheat

Solution:

Step 1: Understanding the Concept:

Sowing machinery is designed based on the shape, size, spacing requirements, and agronomical practices of individual crop seeds. Continuous drilling and precise metering mechanisms are ideal for small, uniform grains that do not require wide hills or single-point precision planting.

Step 2: Detailed Explanation:

A seed drill drops seeds at a specific rate along continuous narrow rows at an even, controlled depth before covering them with soil. This method is perfectly optimized for wheat cultivation, where plants grow optimally in dense, closely-spaced rows with small inter-plant distances. On the other hand, the alternative crops require different specialized planting implements:

- Maize requires a precision "planter" because it must be dropped at exact individual intervals (hill dropping/dibbling) with wider line spacing.

- Sugarcane is propagated vegetatively using stem cuttings (setts), requiring a dedicated sugarcane planter or manual furrow dropping.
- Potato uses tubers or seed pieces, requiring a specialized potato planter equipped with automated picking cups.

Step 3: Final Answer

A seed drill is typically used for sowing small-grain crops like wheat.

Quick Tip: Golden Rule of Agricultural Machinery: Use a Seed Drill for continuous row crops with small seeds (like wheat and barley), and use a Planter for bold seeds that require precise seed-to-seed spacing (like maize and cotton).

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9. Which of the following is an example of a legume or fodder?

(A) Berseem
(B) Oats
(C) Maize
(D) Sugarcane

Correct Answer: (A) Berseem

Solution:

Step 1: Understanding the Concept:

Fodder crops are grown explicitly to feed livestock. These are botanically divided into leguminous fodders (Fabaceae family), which enrich the soil with nitrogen through symbiotic root nodules and are high in crude protein, and non-leguminous/cereal fodders (Poaceae family), which provide bulk biomass and carbohydrates.

Step 2: Detailed Explanation:

Berseem (Trifolium alexandrinum), also known as Egyptian clover, is a premier winter leguminous fodder crop grown extensively in India. It forms symbiotic associations with Rhizobium bacteria to fix atmospheric nitrogen, resulting in highly nutritious, protein-rich green forage

for dairy animals.

Evaluating the other options:

- Oats (Avena sativa) and Maize (Zea mays) are members of the grass family (Poaceae). While they can both be fed to cattle as excellent green forage or silage, they are structurally non-leguminous cereal crops.
- Sugarcane (Saccharum officinarum) is a cash crop cultivated primarily for commercial sugar production, not a dedicated forage legume.

Step 3: Final Answer

Berseem is a highly valuable leguminous fodder crop.

Quick Tip: To easily identify leguminous fodders on agronomy tests, look out for clovers and beans: Berseem, Lucerne (Alfalfa), and Cowpea are the most common high-protein nitrogen-fixing legume fodders.

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10. Chemically, carbohydrate is:

(A) Acid

(B) Polyhydride or Aldehyde or Ketone

(C) Alcohol

(D) None

Correct Answer: (B) Polyhydride or Aldehyde or Ketone

Solution:

Step 1: Understanding the Concept:

Carbohydrates are the most abundant biomolecules on Earth, acting as primary energy sources and structural components in living systems. Modern chemical definitions classify them based on their exact functional groups and atomic arrangements rather than just their empirical formula.

Step 2: Detailed Explanation:

Historically, carbohydrates were viewed simply as "hydrates of carbon" with the general formula $C_n(H_2O)_m$. However, structural chemical analyses revealed that they possess multiple hydroxyl ($-OH$) groups and a distinct carbonyl ($C=O$) functional group.
Therefore, carbohydrates are strictly defined as optically active polyhydroxy aldehydes or polyhydroxy ketones, or larger molecular networks that break down into these simpler units upon hydrolysis.

- Aldoses: Carbohydrates containing an aldehyde group ($-CHO$) at the terminal position (e.g., Glucose).
- Ketoses: Carbohydrates containing a ketone group ($C=O$) at an internal position (e.g., Fructose).

In multiple-choice options, "Polyhydride" is commonly printed or adapted as a shorthand mistranslation/variant for "polyhydroxy" alongside their respective carbonyl groupings.

Step 3: Final Answer
Chemically, carbohydrates are classified as polyhydroxy (polyhydride) aldehydes or ketones.

Quick Tip: To remember their composition, look closely at their open-chain forms: "Polyhydroxy" means they are rich in alcohol ($-OH$) groups, while "Aldehyde or Ketone" indicates the unique functional backbone that determines how they react as reducing or non-reducing sugars.
