



Computation Based Reviewer

By Agriculture Review

1. A rice crop has a nitrogen recommendation of 120 kg N ha^{-1} . If urea (46% N) is the only N source used, how many kilograms of urea per hectare should be applied? (Use: $\text{kg fertilizer} = \text{N requirement} / \text{fraction N in fertilizer}$)

- a) 208 kg ha^{-1}
- b) 261 kg ha^{-1}
- c) 320 kg ha^{-1}
- d) 180 kg ha^{-1}

2. Maize is to be planted at 0.75 m between rows and 0.20 m between plants in a row. Desired plant population is one plant per hill; seed germination is 85% and 1000-seed weight is 300 g. Approximately what seed rate (kg ha^{-1}) should be sown? (Steps: $\text{plants ha}^{-1} = 10,000 / (\text{row spacing} \times \text{plant spacing})$; $\text{seeds to sow} = \text{plants} / \text{germination}$; $\text{kg} = (\text{seeds}/1000) \times (\text{1000-seed weight g})/1000$)

- a) 30.6 kg ha^{-1}
- b) 23.5 kg ha^{-1}
- c) 18.9 kg ha^{-1}
- d) 45.0 kg ha^{-1}

3. A soil core of volume 1000 cm^3 yielded an oven-dry mass of 1200 g. What is the bulk density of the soil? (Bulk density = dry mass / volume)

- a) 0.83 g cm^{-3}
- b) 1.00 g cm^{-3}
- c) 1.20 g cm^{-3}
- d) 1.50 g cm^{-3}

4. Convert grain moisture content from 25% (wet basis) to dry basis. (Use: $M_{\text{dry}} = M_{\text{wet}} / (1 - M_{\text{wet}})$, where M expressed as decimal)

- a) 20.0% (dry basis)
- b) 25.0% (dry basis)
- c) 30.0% (dry basis)
- d) 33.33% (dry basis)

5. A pig grows from 20 kg to 50 kg body weight while consuming 100 kg of feed. What is the feed conversion ratio (FCR)? ($\text{FCR} = \text{feed consumed} / \text{weight gain}$)

- a) 3.33
- b) 2.50
- c) 4.00
- d) 1.25

6. A crop requires 5 mm evapotranspiration per day. If irrigation is withheld for 10 days, what volume of water (m^3) is required to replace ET over 1 ha? (1 mm on 1 ha = 10 m^3)

- a) 50 m^3
- b) 5000 m^3
- c) 500 m^3
- d) 250 m^3

7. In a selection trial phenotypic variance (V_p) = 25 and genotypic variance (V_g) = 10. What is the broad-sense heritability (H^2) expressed as a percentage? ($H^2 = V_g / V_p \times 100$)

9. You have a 20% (w/v) stock solution of a pesticide and need to prepare 10 L of 0.1% (w/v) spray. How many millilitres of the stock are required? (Use $C_1V_1 = C_2V_2$)

- a) 50 mL
- b) 5 mL
- c) 500 mL
- d) 250 mL

10. An irrigation requirement for a field is 50 mm (depth) on a 1-ha plot. If the pump must supply this water in 2 hours, what is the required pump discharge in $L s^{-1}$? ($1 \text{ ha} \times 50 \text{ mm} = 500 \text{ m}^3$; $1 \text{ m}^3 = 1000 \text{ L}$)

- a) $69.44 L s^{-1}$
- b) $120.00 L s^{-1}$
- c) $30.56 L s^{-1}$
- d) $250.00 L s^{-1}$

11. A dairy cow consumes 25 kg of dry matter daily and gains 1.5 kg body weight per day. What is its feed efficiency? (Feed efficiency = weight gain / feed intake)

- a) 0.06
- b) 0.15
- c) 1.67
- d) 0.25

12. If 1 kg of complete fertilizer (14-14-14) costs ₱25, what is the cost per kilogram of nitrogen supplied? (Use: 1 kg fertilizer contains 0.14 kg N)

- a) ₱150.00 per kg N
- b) ₱178.57 per kg N
- c) ₱125.00 per kg N
- d) ₱200.00 per kg N

13. A hybrid corn field has an average yield of 8 tons ha^{-1} . If the moisture at harvest is 25% and the market requires 14% moisture, what is the adjusted yield at 14% moisture? (Adjusted yield = $(100 - \text{harvest moisture}) / (100 - \text{required moisture}) \times \text{actual yield}$)

- a) 6.98 tons ha^{-1}
- b) 7.9 tons ha^{-1}
- c) 8.4 tons ha^{-1}
- d) 9.1 tons ha^{-1}

14. A 15% protein concentrate and a 5% protein roughage are mixed to produce 100 kg of feed with 10% crude protein. What amount of concentrate is needed? (Use: Pearson's square method)

- a) 25 kg
- b) 33.3 kg
- c) 50 kg
- d) 66.7 kg

15. If a hybrid's mean yield is 80 q ha^{-1} , the population mean is 60 q ha^{-1} , and the selection differential is 20 q ha^{-1} , with heritability 50%, what is the expected genetic gain? (Genetic gain = $h^2 \times \text{selection differential}$)

- a) 5 q ha^{-1}
- b) 8 q ha^{-1}
- c) 10 q ha^{-1}
- d) 20 q ha^{-1}

16. A soil sample weighing 500 g is dried and loses 50 g of water. What is its moisture content on a wet basis? (Moisture % = $\text{water loss} / \text{wet weight} \times 100$)

- a) 5%
- b) 8%
- c) 10%
- d) 12%

17. The productivity index (PI) of a cropping system is calculated as $PI = (\text{Yield of crop} / \text{Standard yield}) \times 100$. If maize yields 6 t ha^{-1} and the standard yield is 8 t ha^{-1} , what is PI?

27. In a breeding trial, additive genetic variance (V_a) = 6 and phenotypic variance (V_p) = 20. What is the narrow-sense heritability (h^2) in percent?

- a) 10%
- b) 20%
- c) 50%
- d) 30%

28. A pump delivers $0.05 \text{ m}^3 \text{ s}^{-1}$ of water to a lift (head) of 20 m. Calculate the hydraulic power in kW (use $\rho = 1000 \text{ kg m}^{-3}$ and $g = 9.81 \text{ m s}^{-2}$). (Power = $\rho g Q H$)

- a) 9.81 kW
- b) 1.96 kW
- c) 0.981 kW
- d) 98.1 kW

29. If 1 g of a soluble fertilizer is dissolved in 2 L of water, what is the concentration in ppm (mg L^{-1})?

- a) 200 ppm
- b) 500 ppm
- c) 1000 ppm
- d) 50 ppm

30. Given particle density = 2.65 g cm^{-3} and porosity = 40%, what is the bulk density (g cm^{-3}) of the soil? (Bulk density = particle density $\times$ (1 – porosity))

- a) 0.40 g cm^{-3}
- b) 1.00 g cm^{-3}
- c) 1.59 g cm^{-3}
- d) 2.65 g cm^{-3}

Detailed Answer Key

1. b

2. b

3. c

4. d

5. a

6. c

7. b

8. d

9. a

10. a

11. a

12. b

13. a

14. c

15. c

16. c

17. c

18. a

19. c

20. c

21. b

22. c

23. d

24. a

25. b

26. c

27. d

28. a

29. b

30. c