

UNIVERSITY OF RUHUNA  
**SECOND EXAMINATION IN B.Sc. AGRICULTURAL RESOURCE MANAGEMENT &  
TECHNOLOGY (PART II)- January 2022**

Machinery System Engineering (EN2201)

Time: 30 minutes

MCQ Type

Index No:

**Answer all questions.**

Please ensure that you have written your index number in the space provided above.  
Each question has 5 answers, indexed under (a), (b), (c), (d) and (e).

Mark the correct answer by placing “ ✓ “.

Only one answer should be marked in each question. If more than one answer is marked for a question, that question will not be evaluated.

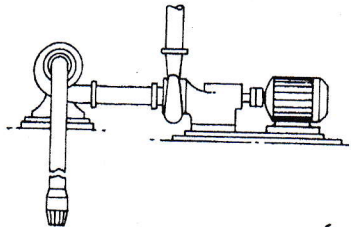
Only non – programmable calculators are permitted.

Mobile phones are not allowed.

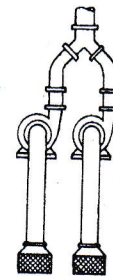
(1). Which plough of the followings is used to break hardpans or plough sole layer of soil?

- (a) Rotovator
- (b) Disk plough
- (c) Subsoil plough
- (d) Rotating auger plough
- (e) Mouldboard

(2). Figure: A, and B indicate the different water pumps installation methods



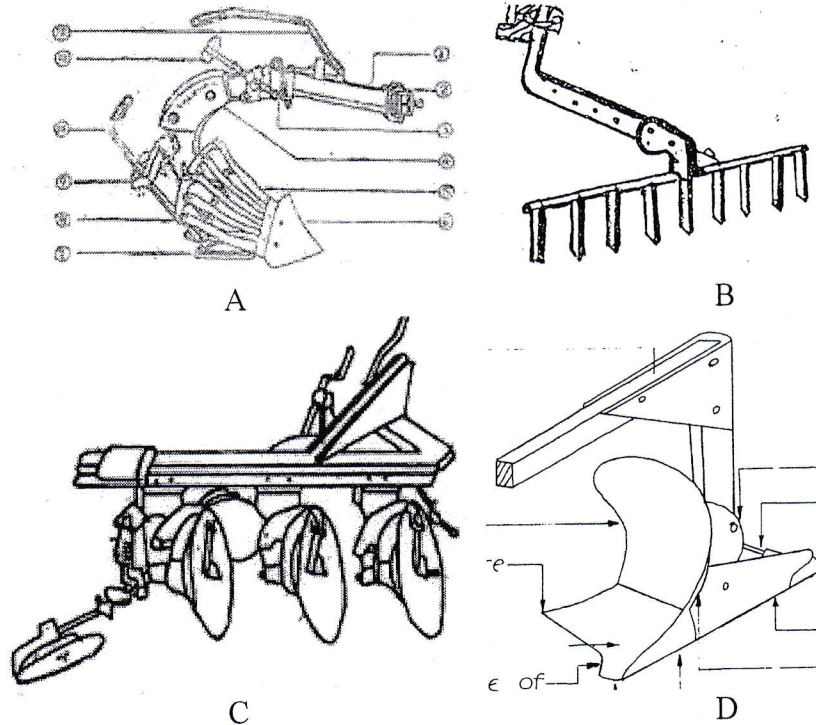
A



B

- (a) In figure A; Pump are connected in parallel and in figure B; Pump are connected in series
- (b) In figure A; Pump are connected in series and in figure B; Pump are connected in parallel
- (c) In figure A and B Pumps are connected in parallel
- (d) In figure A and B Pumps are connected in series
- (e) In figure A; pumps connected with deep well kit

Use the following figures of implements to answer the questions numbers 3 – 5.



(3). Identify the plough types.

- (a) A- Reversible Mouldboard plough, B- Blade harrow, C- Disk plough, D- Mouldboard plough
- (b) A- Harrow, B- Mouldboard plough C- Disk plough, D- Reversible Mouldboard plough
- (c) A- Mouldboard plough, B- Harrow, C- Disk plough, D- Reversible Mouldboard plough
- (d) A- Mouldboard plough, B- Harrow, C- Disk harrow, D- Reversible Mouldboard plough
- (e) A- Disk plough, B- harrow, C- Reversible Mouldboard plough, D- Mouldboard plough

(4). Two-wheel tractor operated plough/s is/are;

- (a) Only A
- (b) Only B
- (c) Only A and B
- (d) Only A, C and D
- (e) A, B, C and D

(5). Four-wheel tractor operated plough/s is/are;

- (a) Only A
- (b) Only B
- (c) Only A and B
- (d) Only C and D
- (e) A, B, C and D

- (6). When a centrifugal pump casing is filled with liquid before it is started, it is called as;
- (a) Adiabatic expansion
  - (b) Priming
  - (c) Adiabatic compression
  - (d) Isentropic expansion
  - (e) Water mining
- (7). The least efficient power utilization activity of a tractor is;
- (a) Rotary tillage
  - (b) Harrowing
  - (c) Power operated seeder
  - (d) Paddy reaping
  - (e) Water pumping for drip irrigation system
- (8). **Correct** statement/s of the following is/ are;
- I. Wheel numeric value can be estimated by cone index value, tire section width, overall diameter and load on tire
  - II. Soil strength of soil can be measured using cone penetrometer.
  - III. Mobility number can be used for calculate gross tractive coefficient.
- (a) Only I
  - (b) Only I & II
  - (c) Only II & III
  - (d) Only I & III
  - (e) Above All
- (9). Most suitable traction development method for land preparation in paddy field would be;
- (a) Using tandem wheels
  - (b) Using lug wheels
  - (c) Ballasting
  - (d) Using tracks
  - (e) Using dual tires
- (10). A tractor working at 0.8 ha/h effective field capacity and lost 30 min for turning and loading seeds (Non-productive time). If the area covered is 4 ha, the productive time is;
- (a) 3.5 h.
  - (b) 2 h.
  - (c) 5 h.
  - (d) 4.5 h.
  - (e) 5.5 h.

(11). Which statement is **incorrect** regarding the cost of farm machinery?

- (a) The machinery cost per hectare increases with machine size.
- (b) Larger machine increases the labor costs
- (c) Timeliness costs of machine decrease sharply when machines are too big.
- (d) If timeliness cost is not considered, the small machine would be more economical
- (e) Machine with greater capacity will accomplish more timely work

(12). A tractor with a front wheel reaction of 32kN and rear wheel reaction of 53 kN when a tractor is sitting on horizontal surface. The wheel base is 300 cm. Calculate the maximum drawbar force of the tractor if the draw bar height is 70 cm.

- (a) 5.4 kN
- (b) 9.8 kN
- (c) 98.6 kN
- (d) 137.1 kN
- (e) 278.6 kN

(13). What is a major advantage of centrifugal pump?

- (a) Cost
- (b) Simple in construction
- (c) Efficiency
- (d) Pump parameters
- (e) High head

(14). The most common pump used for hydraulic fluid power application is;

- (a) Centrifugal pumps
- (b) Gear pump
- (c) Froth pumps
- (d) Airlift pumps
- (e) globe pumps

(15). Gear pumps are

- (a) Tangential flow pumps
- (b) Positive displacement pumps
- (c) Negative displacement pumps
- (d) Radial pumps
- (e) Variable displacement pumps



(16). Ply rating of tyre indicates

- (a) Load-bearing capacity
- (b) Load-pulling capacity
- (c) Both (a) & (b)
- (d) High mobility number
- (e) Higher wheel numeric value

(17). Hitching an implement above the drawbar on a tractor to get traction will:

- (a) Increase the weight on the front wheels
- (b) Overload the rear axle
- (c) Not move the position of center of gravity
- (d) Increase chances of a rear rollover.
- (e) Decrease the weight on the rear wheel

(18). Correct statement/s of the following is/ are;

- A- By moving forward the center of gravity of the tractor.
- B - By raising the draw bar hitch point
- C- By increasing the weight of Tractor

- (a) Only A
- (b) Only B
- (c) Only A & B
- (d) Only A & C
- (e) All

(19). A tractor with a rear wheel reaction and front wheel reactions are 18 kN and 27 kN when a tractor is sitting on horizontal surface. The wheelbase is 3042 mm. Calculate the horizontal distance from the rear axle centerline to the center of gravity.

- (a) 1825.2 mm
- (b) 1216.8 mm
- (c) 2028.8 mm
- (d) 1014.2 mm
- (e) 1318.8 mm

(20). The suitable pump for small discharge at high-pressure is;

- (a) (a) Centrifugal
- (b) (b) Axial flow
- (c) (c) Mixed flow
- (d) (d) Propeller
- (e) (e) Piston

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