UNIVERSITY OF RUHUNA
FIST EXAMINATION IN B.Sc. AGRICULTURAL RESOURCE MANAGEMENT & TECHNOLOGY
and FIST EXAMINATION IN B.Sc. IN AGRIBUSINESS MANAGEMENT
NOVEMBER 2022

Agricultural Machinery Engineering (EN12201) **Time ½ hrs.**

MCQ Type

Index No:

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.

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01. A two-wheel tractor costing Rs. 100,000/= is expected to have useful life of 10 years and salvage value is 10 % of the purchase price and annual use 1000h. What is the depreciation rate of the tractor?
(a) 0.206
(b) 0.794
(c) 0.10
(d) 0.420
(e) None of the above

02.The machinery replacement is done;
(a) When the accumulated fixed cost becomes a maximum value.
(b) When the unit accumulated cost reaches a minimum value.
(c) When the accumulated depreciation cost become a maximum value.
(d) When the total accumulated cost become minimum value.
(e) Without considering the machine costs.

03. Field efficiency of a machine;
(a) is constant for a particular machine
(b) does not depend on the field size.
(c) is varying with the pattern of field operation.
(d) does not depend on the operator capability
(e) is evaluating using the machine cost and width of the machine.

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

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

05. Mobility number of the traction device is a function of;
(a) Wheel numeric value
(b) Tire width –to– diameter ratio.
(c) Deflection ratio of the tire.
(d) All above three.
(e) None of the above.

06. Cone index is an indication of;
(a) Soil moisture
(b) Soil permeability
(c) Tractor performance
(d) Field capacity
(e) Soil hardness.

07. Which of the following stage is **optimum** for soil tillage operations?
(a) Sticky stage
(b) Liquid stage
(c) Plastic stage
(d) Friable stage
(e) Cemented stage

08. Select the **false** statement regarding the Tractive force;
(a) Tractive force is less than the torque produced at the wheel hub
(b) Tractive force is the driving force developed by a wheel.
(c) The optimum Tractive force develops with excessive slip.
(d) Tractive force develops due to the interaction of traction device with soil.
(e) Tractive force of a track is higher than the rubber tire.

09. Which of the following activity is ***not*** account for the calculation of field efficiency?
(a) Filling the chemical tank during spraying
(b) Adjusting the cutter bar of a combine harvester
(c) Lubrication
(d) Idle travel in turning
(e) Unloading the paddy from a combine harvester

10. 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

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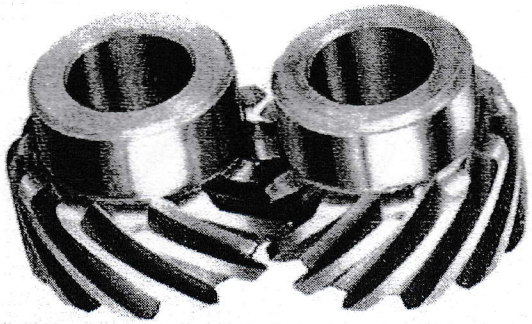
11. What is the name of the following gear type shown below?

a. Rack and Pinion
b. Worm and Wheel
c. Straight spur
d. Bevel
e. Helical Spur



12. What is the revolution number of the crankshaft of one working cycle of four stroke engine?

(a) ½
(b) 1
(c) 2
(d) 4
(e) 8

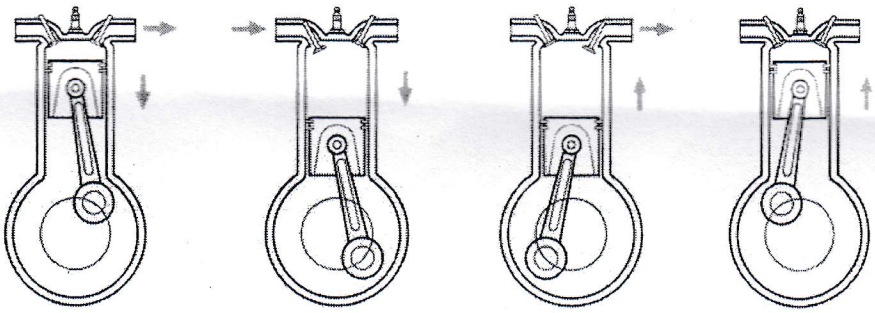
13. What is the compression ratio of an engine with 785 cm^2 displacement in one cylinder and a combustion chamber volume of 105 cm^2 ?

(a) 13
(b) 10
(c) 8.5
(d) 7.5
(e) 11.7

14. . A tractor with 35 cm plough attached into its bottom will have 6km per hour ploughing speed and work only 8 hours per day. What is the total ploughing area will be covered by the tractor in a single day?

(a) 0.39 hectare
(b) 0.67 hectare
(c) 0.23 hectare
(d) 0.40 hectare
(e) 6.72 hectare.

15. Following four illustrations show the four stages of the engine cycle. Select the correct answer with the intake and compression processes in the given pictures below.



a b c d

(a) a & b
(b) a & c
(c) b & d
(d) c & d
(e) a & d

16. In a four-stroke cycle, the minimum temperature inside the engine cylinder occurs at the ;
(a) Beginning of suction stroke
(b) Beginning of exhaust stroke
(c) End of the suction stroke
(d) End of the exhaust stroke
(e) Beginning of compression stroke

17. What is the **incorrect** statement of the tractive efficiency (TE)?

(a). $TE = \dfrac{OutputPower}{InputPower}$ of the traction device.

(b). $TE = \dfrac{NetPull \times ActualTravelSpeed}{WheelTorque \times AngularVelocityoftheWheel}$

(c) $TE = \dfrac{NetTractionCoefficient}{GrossTractionCoefficient} \times (1 - WheelSlip)$

(d). $TE = \left(1 - \dfrac{MotionResistanceRatio}{GrossTractionCoefficient}\right) \times (1 - WheelSlip)$

(e). None of the above

18. A 2.0 Hp water pump is operating for 12h per day over a period of month (30 days). If the cost of electricity is Rs. 9.50/unit, the total cost of operation of the month for the pump would be;

(a) Rs. 537.12
(b) Rs. 170.08
(c) Rs, 5102.64
(d) Rs. 1611.36
(e) Rs. 2551.32

19.Width of cut of disk plough is increased by;

(a) Increasing disk horizontal angle
(b) Increasing disk vertical angle
(c) Decreasing disk horizontal angle
(d) Decreasing disk vertical angle
(e) Addition of more weight

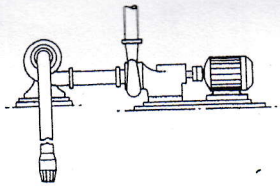
20. Depth of disk plough is increased by;

(a) Increasing disk horizontal angle
(b) Increasing disk vertical angle
(c) Decreasing disk horizontal angle
(d) Decreasing disk vertical angle
(e) Addition of more weight

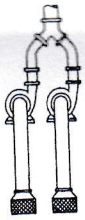
21. Which one of the following is an accessory to Mouldboard plough?

(a) . Mouldboard
(b) . Frog
(c) . Coulter
(d) . Land side
(e) . Share

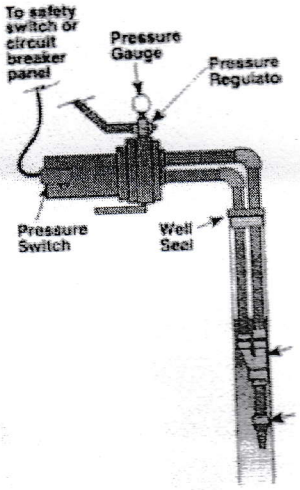
Figure: A, B, C, and D indicate the different water pump installations.



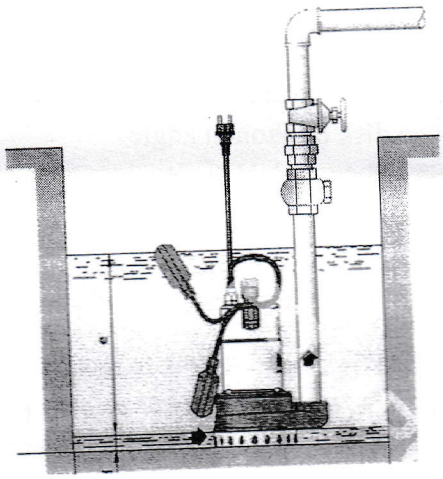
A



B



C



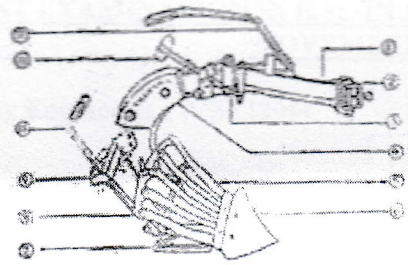
D

Figure:

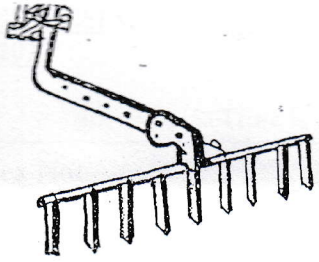
(22) Identify the types of pump installations;

(a) A- serials connected, B- parallel connected, C-submersible pump, D- deep well pump
(b) A- serials connected, B- parallel connected C- deep well pump, D- submersible pump
(c) A- parallel connected, B- serials connected, C- deep well pump, D- submersible pump
(d) A- submersible pump, B- deep well pump, C- serials connected, D- parallel connected
(e) A- Submersible pump, B- serials connected, C- - parallel connected, D- deep well pump

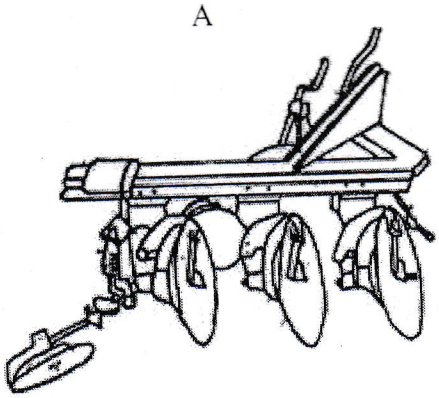
Use the following figures of implements to answer the questions numbers 23 – 25.



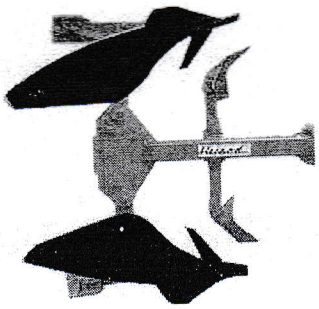
A



B



C



D

(23). Identify the types of modern ploughs.

(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

(24). 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

(25). 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

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