GIET UNIVERSITY, GUNUPUR – 765022
B. Tech (Fourth Semester – Regular) Examinations, June – 2021
BPCAG4040 – FARM, MACHINERY AND EQUIPMENT – I
(Agricultural Engineering)

Time: 2 hrs   Maximum: 50 Marks

Answer ALL Questions
The figures in the right hand margin indicate marks.

PART – A: Answer *ALL* questions   **(1 x 10 = 10 Marks)**

Q.1. **Select the most appropriate answer**

a. Hardness of a metallic material is tested by
    (i) Brinell test   (ii) Rockwell test
    (iii) Vickers test   (iv) all the above

b. Plain bearings are also known as
    (i) Bush bearings   (ii) Sleeve bearings
    (iii) Split bearings   (iv) all the above

c. Size of MB plow is expressed in terms of
    (i) Length of share   (ii) length of mould board
    (iii) width of furrow it makes   (iv) None of these

d. Which of the following is a secondary tillage machinery
    (i) Rotary tiller   (ii) MB plow
    (iii) Disk plow   (iv) Sub soiler

e. Tandem Harrow is
    (i) a single action type   (ii) double action type
    (iii) offset type   (iv) None of the above

f. In MB plow the side thrust from furrow wall is taken care by
    (i) Throat of share   (ii) Landside of the plow
    (iii) Gunnel of share   (iv) All of the above

g. Which type of tillage implement is associated with "Disk Angle"
    (i) blade type   (ii) Disk type
    (iii) Shovel type   (iv) Rotary type

h. With increase of tilt angle the depth of Disk plow
    (i) increases   (ii) decreases
    (ii) remain same   (iv) Not affected

i. Tilt angle of a vertical plow is
    (i) 15 to 25 deg   (ii) 0 to 10 deg
    (iii) 0 deg   (iv) 40 to 45 deg

j. In a planter
    (i) row spacing is uniform   (ii) plant spacing is uniform
    (iii) Both i and ii   (iv) None is correct

PART – B: <u>Answer *ALL* questions</u>**:**   **(2 x 5 = 10 Marks)**

Q.2. **Write short notes on**

a. Minimum tillage
b. Performance Index of MB plow
c. Hardening and tempering of steel
d. Metering of Seed drill
e. Horizontal suction of MB plow

PART – C: **(6 x 5 = 30 Marks)**

Answer **ANY FIVE** questions   Marks

3. A tractor is pulling a 3X30 cm MB plow at a speed of 3 kmph. The depth of furrow is   (6)
    20 cm, and the resistance of soil is 1 kg/cm^2. Calculate Drawbar HP.

4. With the help of a neat sketch explain the different components of a MB plow and   (6)
    their functions

5. The following data were recorded during calibration of a seed drill.   (6)

    i.   Size of seed drill = 9 X 18 cm,
    ii. Diameter of ground wheel = 14 cm,
    iii. No. of rotation of wheel = 25,
    iv. Dropped seed = 1.2 kg.

    Calculate the seed rate.

6. Explain the different types of seed metering mechanism adopted in seed drills.   (6)

7. Explain the functional difference between seed drill and planter with examples of   (6)
    crops for which they are suitable.

8. An 8 row seed drill with row spacing 20 cm is moving at a speed of 1.5 kmph. If the   (6)
    field efficiency is 65 per cent, how much time will it take to cover a 6-hectare field?

9. A farmer purchased a 45 hp tractor at total cost of 6 lacs. The fuel consumption the   (6)
    tractor is 7 litres/h at the ploughing speed of 4 km/h. Calculate the cost of operation
    of tractor/hr. Assume interest=10% of capital cost, houses taxes & insurance = 3% of
    capital cost, lubricants@30% of fuel cost, fuel cost= Rs. 90/lt, Wages @ Rs. 400/-
    per day for 8 hours.

10. What is heat treatment? Describe the different forms of cast iron due to heat   (6)
    treatment.

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