MAHARASHTRA AGRICULTURAL UNIVERSITIES EXAMINATION BOARD, PUNE
SEMESTER END EXAMINATION

B.Sc. (Agri.)

Semester	**: V (New)**	**Term**	**: I**	**Academic Year**	**: 2011-12**
Course No.	**: ENGG 353**	**Title**	**: Farm Power and Machinery**		
Credits	**: 2(1+1)**				
Day & Date	**: Friday, 30.09.2011**	**Time**	**: 14.00 to 16.00**	**Total Marks**	**: 40**

Note : 1. Solve **ANY EIGHT** questions from **SECTION "A".**
2. All questions from **SECTION "B"** are compulsory.
3. All questions carry equal marks.
4. Draw neat diagrams wherever necessary.

SECTION "A"

Q.1 a) Discuss about the concept of farm mechanization.
b) Give the benefits of farm mechanization.

Q.2 a) A four stroke engine has a mean effective pressure of 7kg/cm^2 , area of piston 730 cm^2, stoke length 45cm, torque due to break load is 110 kg-meter, fuel consumed per hr is 4.5 kg and working speed 120 rpm. Find IHP, BHP and specific fuel consumption. (3)
b) State the functions of fly wheel. (1)

Q.3 a) Explain about fuel supply system of spark ignition engine.
b) What are the main objectives of secondary tillage?

Q.4 a) Determine the horse power required to pull of four bottom 30 cm plough working to depth of 15 cm. The tractor is operating at a speed of 6 km/ph. The soil resistance is 0.7 kg/cm^2. (3)
b) What is mean by the term scavenging? (1)

Q.5 a) Explain about primary tillage in short.
b) Enlist the components of disc harrow.

Q.6 A Five tyne cultivator having tynes spaced 8 cm apart and working to a depth of 5 cm is running at a speed of 3 km/hrs. There is a time loss of 10 percent while turning. Calculate the time required to cultivate per hectare. If the resistance of the soils 0.6 kg/cm^2. What would be the maximum draft and HP required when the width of each furrow is 5 cm.

Q.7 Explain in detail about different types of dusters.

Q.8 a) Give the names of different methods of sowing of crops.
b) State the functions of seed drill.

(P.T.O.)

Q.9 a) What are the advantages of disc plough?

b) How adjustments are done on disc plough for controlling depth or width of ploughing and to increase pulverization.

Q.10 a) How many acres can be covered by a harrow of width 1.5 m in a day of 8 hrs. with bullock power. The speed of the bullocks is 4 km/hr. If each spike tooth harrow is giving 1 kg resistance when there are 50 spikes. What HP would be necessary for bullocks to pull the harrow? (3)

b) Enlist the demerits of human power. (1)

SECTION "B"

Q.11 Define the following terms.

1) Threshing
2) Piston displacement
3) Mechanical efficiency
4) Harrow

Q.12 Fill in the blanks.

1) The _____ of diesel engine varies from 14:1 to 22:1.
2) Power developed by an _____ pair of bullocks is about 1 HP for usual farm work.
3) _____ is that part of the plough which slides against the furrow walls and gives lateral stability in the plough.
4) _____ is a machine used to spray herbicides in the form of droplets to remove weeds.

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MAHARASHTRA AGRICULTURAL UNIVERSITIES EXAMINATION BOARD, PUNE
SEMESTER END EXAMINATION

B.Sc. (Agri.)

Semester	**: V (New)**	**Term**	**: I**	**Academic Year**	**: 2010-11**
Course No.	**: ENGG 353**	**Title**	**: Farm Power and Machinery**		
Credits	**: 2(1+1)**				
Day & Date	**: Monday, 25.10.2010**	**Time**	**: 14.00 to 16.00**	**Total Marks**	**: 40**

Note :
1. Solve **ANY FIVE** questions from **SECTION "A".**
2. All questions from **SECTION "B"** are compulsory.
3. All questions carry equal marks.
4. Draw neat diagrams wherever necessary.

SECTION "A"

Q.1 Give the merits and demerits of animal and mechanical power.

Q.2 Differentiate between diesel and petrol engine.

Q.3 A four stroke engine has mean effective pressure of 7 kg./cm^2, area of piston 730 cm^2, stroke length 45 cm, torque due to break load is 110 kg-m, fuel consumed per hour is 4.5 kg and working speed is 120 revolution per minute. Find IHP,BHP, mechanical efficiency, specific fuel consumption and swept volume.

Q.4 a) Enlist the different sowing methods. (2)

b) The following results were obtained while calibrating the seed drill. (3)

Calculate the seed rate in kg/ha.

1) No. of furrow openers – 10
2) Spacing between furrow openers – 20 cm.
3) Diameter of drive wheel – 1.5 meter.
4) Speed – 100 revolutions per minute
5) Seed collected – 4 kg.

Q.5 Discuss the factors governing selection of a tractor.

Q.6 a) Enlist different seed metering mechanisms. (2)

b) A three bottom tractor plough cuts rectangular furrow each 23 cm wide and 15 cm deep. If the average resistance of soil is 0.75 kg/cm^2, calculate the horse power of the tractor. The working speed of tractor is 4 kg/hr. (3)

Q.7 a) Enlist the objectives of tillage. (2)

b) Give the classification of plant protection equipment. (3)

SECTION "B"

Q.8 Define.

1) Compression ratio
2) Thermal efficiency
3) Harvesting
4) Disk angle
5) Tillage

Q.9 Fill in the blanks.

1) A strong healthy man can develop about_____HP.
2) _____is horizontal component of pull parallel to the line of motion.
3) _____is the angle at which the plane of the cutting edge of disk is inclined to vertical line.
4) Cam shaft rotates at_____ the speed of engine.
5) _____is that part of plough bottom to which share, mould board and land slide are attached.

Q.10 State True or False.

1) BHP of an engine is always more than its IHP.
2) Two stroke cycle engine is provided with valves.
3) Vertical suction of M.B. plough is responsible for its proper penetration angle.
4) Thermal efficiency of four stroke cycle engine is more than two stroke cycle engine.
5) Seed drill maintains plant to plant and row to row distance.

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MAHARASHTRA AGRICULTURAL UNIVERSITIES EXAMINATION BOARD, PUNE
SEMESTER END EXAMINATION

B.Sc. (Agri.)

Semester	: V (New)	**Term**	: I	**Academic Year**	: 2013-14
Course No.	: ENGG 353	**Title**	: Farm Power and Machinery		
Credits	: 2(1+1)				
Day & Date	: Monday, 28.10.2013	**Time**	: 14.00 to 16.00	**Total Marks**	: 40

Note :
1. Solve **ANY EIGHT** questions from **SECTION "A".**
2. All questions from **SECTION "B"** are compulsory.
3. All questions carry equal marks.
4. Draw neat diagrams wherever necessary.

SECTION "A"

Q.1 Give the merits and demerits of animal and mechanical power.

Q.2 Explain the working of simple carburetor with help of neat diagram.

Q.3 A four stroke engine has a mean effective pressure of 7 Kg/cm^2, area of piston is 730 Kg/cm^2, stroke length 45 cm, torque due to brake load is 110 Kg-meter, fuel consumption is 4.5 Kg and working speed 120 rev/min. Find IHP,BHP, Mechanical efficiency and specific fuel consumption.

Q.4 Define tractor. Give different types of tractors.

Q.5 Find the cost of using a tractor per hp-hr when the cost of 35HP diesel tractor is Rs. 4,55,000/-, life of tractor is 10 years, rate of interest is 12 per cent and working hours per year are 1000 hours Make suitable assumption: if necessary.

Q.6 Give the advantages and disadvantages of disc plough.

Q.7 A harrow with 50 spikes each giving a resistance of 1 kg, speed of the bullocks 4 kg/hour and working width of harrow 1.5 meter, calculate:

i) Area covered per day of 8 hours ii) Required horse power to pull the harrow

Q.8 Give the names of different methods of sowing crops and state the function of seed drill.

Q.9 What do you understand by proper registration and alignment of mower?

Q.10 Give the classification of sprayers and dusters.

SECTION "B"

Q.11 Select the proper answer from the bracket.

1) _____ has more thermal efficiency. (Diesel engine/Carburetor engine)
2) The angle made by disc blade with vertical plane in disc plough is known as _____. (tilt angle/ disc angle/ king pin inclination)
3) _____ is the power available at the piston head. (BHP/IHP/FHP)
4) A pair bullock can develop about _____. (One-tenth/one/half)

Q.12 Define the following terms.

1) Tillage
2) Harvesting
3) Seed metering
4) Horse power

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MAHARASHTRA AGRICULTURAL UNIVERSITIES EXAMINATION BOARD, PUNE
SEMESTER END EXAMINATION

B.Sc. (Agri.)

Semester	: V (New)	**Term**	: I	**Academic Year**	: 2012-13
Course No.	: ENGG 353	**Title**	: Farm Power and Machinery		
Credits	: 2(1+1)				
Day & Date	: Wednesday, 31.10.2012	**Time**	: 14.00 to 16.00	**Total Marks**	: 40

Note :
1. Solve **ANY EIGHT** questions from **SECTION "A".**
2. All questions from **SECTION "B"** are compulsory.
3. All questions carry equal marks.
4. Draw neat diagrams wherever necessary.

SECTION "A"

Q.1 Enlist and explain different sources of farm power available in India.

Q.2 Explain four stroke cycle engine with the help of neat diagrams.

Q.3 Calculate BHP and mechanical efficiency of 4 stroke, 4 cylinder I.C. engine having cylinder diameter 12.5 cm, stroke length 15 cm, engine speed 1000 rpm, mean effective pressure 7 kg/cm^2, frictional HP of engine is 30 HP.

Q.4 Define tractor. Write the points to be considered while selecting the tractor.

Q.5 Define tillage. Write the different objectives of tillage.

Q.6 Calculate area covered per day of 8 hrs by a tractor drawn 4 bottom, 35 cm M.B.plough if speed of ploughing is 6 kmph. Time lost in turning is 6%.

Q.7 Enlist different sowing methods. Write the detail procedure of calibration of seed drill.

Q.8 Write the detail classification of different plant protection equipments.

Q.9 Enlist different harvesting equipments. Explain sickle with the help of neat diagram.

Q.10 Write short notes on (Any Two)

1) Air cleaner
2) Planter
3) Equipments for land development

SECTION "B"

Q.11 Define the following terms.

1) Bore
2) Compression ratio
3) Seed metering
4) Threshing

Q.12 State True or False.

1) A strong healthy man can develop 0.1 HP.
2) Depreciation is an item included under operating cost.
3) Cultivator is a primary tillage implement.
4) Sprayer is a machine used to apply chemicals in powder form.

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MAHARASHTRA AGRICULTURAL UNIVERSITIES EXAMINATION BOARD, PUNE
SEMESTER END EXAMINATION
B.Sc. (Agri.)

Semester	: **V (New)**	**Term**	: **I**	**Academic Year**	: **2015-16**
Course No.	: ENGG 353	**Title**	: **Farm Power and Machinery**		
Credits	: 2(1+1)				
Day & Date	: Friday, 30.10.2015	**Time**	: 14.00 to 16.00	**Total Marks**	: **40**

Note :
1. Solve **ANY EIGHT** questions from **SECTION "A".**
2. All questions from **SECTION "B"** are compulsory.
3. All questions carry equal marks.
4. Draw neat diagrams wherever necessary.

SECTION "A"

Q.1 What are the different sources of farm power available in India? Highlight each of them in short.

Q.2 Enlist the different types of sprayers. State the purpose and function of sprayers.

Q.3 Calculate the cost of seeding one hectare of land with bullock-drawn seed drill of 5 x30 cm size. The speed of bullock is 3 km/hr. Hire charges of bullock pair are Rs.500/- per day, hire charges of seed drill Rs.150/- per day and wage of operator Rs.250/- per day of 8 hours.

Q.4 Explain the working of four stroke cycle engine with the help of neat sketch.

Q.5 A four cylinder four stroke diesel engine has cylinder diameter of 25 cm, stroke bore ratio is 1.8, clearance volume 4500 cm^3, engine speed 240 rpm, mean effective pressure 6.8 kg/cm^2 and mechanical efficiency is 75%. Calculate (i) IHP, (ii) BHP, (iii) Swept volume and (iv) Compression ratio.

Q.6 What is the principle of air cooling? Give the advantages and disadvantages of air cooling system.

Q.7 Find the field capacity (actual and theoretical) of 7 tyne cultivators running at 4 km/h speed. The spacing between tynes is 45 cm and 5.5 per cent time loss is expected during the operation. Find the time required to cover 13 hectare of land with this cultivar.

Q.8 What are the advantages of disc plough? What adjustments are made on disc plough for controlling depth and width of ploughing?

Q.9 What do you understand by proper registration and alignment of mower?

Q.10 What is carburetor? State the important functions and different parts of carburetor.

SECTION "B"

Q.11 Define the following terms.

1) Threshing
2) Specific fuel consumption
3) Tilt angle
4) Furrow

Q.12 Fill in the blanks.

1) The process of removal of burnt gases from engine cylinder is known as_____.
2) _____ is a machine to cut the grain crops.
3) _____ is the process of placing the seeds in the holes made in seedbed and covering them.
4) Camshaft is rotated at _____ of the engine speed.

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