Dr. PANJABRAO DESHMUKH KRISHI VIDYAPEETH, AKOLA
SEMESTER END THEORY EXAMINATION

MODEL ANSWERS

B.Sc. Agriculture (Hons.)

Semester	:	III	Term	:	I	Academic Year	:	2021-22
Course No.	:	ENGG-232	Title	:		Farm Machinery and Power		
Credits	:	(1+1)						
Day & Date	:	21.11.2021	Time	:		Total Marks	:	40

Note : 1) **Solve ANY FOUR questions from SECTION-A**
2) **Solve ANY SIX questions from SECTION-B**
3) **ALL questions from SECTION-C are compulsory**
4) **Send the PDF file of answer sheet to the email id of respective course teacher**

	SECTION-A
	(Write the answers in 4-5 sentences only. Each question carries 4 marks)
Q. 1	**Write the components of fuel supply system of diesel engine** **Ans:** The components of Fuel supply system of diesel engine **1. Fuel Tank:**It is storage tank of suitable size and shape. Atmospheric pressure is maintained in the tank with the help of pin hole on the top of cap. **2. Fuel lift pump (Feed pump):**Fuel lift pump may be i) Plunger type or ii) Diaphragm type . **3. Fuel Filter:** Mostly two stage filters are used in diesel engine.a) Primary b) Secondary. **4. Fuel Injection Pump:**It is high pressure pump which supplies fuel to the injector according to the firing order of the engine. **5. Fuel Nozzles:** It is the component which delivers finely atomised fuel under high pressure to the combustion chamber of the engine.
Q. 2	**Explain the types of spray on the basis of volume of spray** **Ans:** TYPE OF SPRAY (1) High volume spray (more than 400 litres spray/ha) (2) Low volume spray (5 to 400 litres, per hectare) (3) Ultra low volume (ULV) spray (less than 5 litres spray/ha). **(1) High volume spray** The dilute liquids are applied by hydraulic machines. It consumers more time and labour. **(2) Low volume spray** It uses air steam from a fan as a pesticide carrier with small quantities of liquid. There is saving of material and labour. **(3) Ultra low volume spray** ULV spraying can be defined as plant protection operation in which total volume of liquid applied amount to a few milli litre per acre. It is mainly used in air craft spraying.

Q. 3	**Write the classification of tractors on the basis of structural design** **Ans-:** Classification of tractors on the basis of structural design: 1. **Wheel tractors:** Tractors having three or four pneumatic wheels are called wheel tractors 2. **Crawler Tractors:** In these tractors there is endless chain or track in place of pneumatic wheels. This is also called as chain type or track type tractor 3. **Power tiller:** It is walking type tractor. This tractor is usually fitted with two wheels only. The direction of travel and field operations are controlled by operator walking behind the tractor
Q. 4	**Explain principle of working of four stroke engine in short** **Ans-:** In four stroke cycle engine, there are four strokes completing two revolution of the crankshaft. These are respectively the suction compressions, power and <u>e</u>xhaust stroke. On its suction stroke only air is drawn in to the cylinder during stroke through the inlet valve, whereas the exhaust valve is closed. The next stroke is compression stroke and the charge is compressed in the cylinder by the piston. If the charge is only air, the fuel is injected into the cylinder at the end of compression. The charge is compressed at pre decided time, under specified pressure inside the engine cylinder. The power developed by the expansive forces of gases inside the cylinder is transferred to the crankshaft through the connecting rod. Exhaust gases go out of the cylinder at regular interval of time.
Q. 5	**Total draft of four bottom 40 cm M.B. plough when ploughing 17.5 cm deep at 5.5 km/hr speed is 1700 kg. a) Calculate the unit draft in kg/cm² b) What is actual power requirement?** **Ans:** i) Unit draft = Total draft/ cross section area = 1700/ (4 x 40 x 17.5) $\qquad\qquad\qquad\qquad$ = 1700/2800 $\qquad\qquad\qquad\qquad$ = 0.607 kg/cm² = 0.607 x 98 kPa= 59.48 kPa $\qquad\qquad\qquad\qquad$ (multiply by 98) ii) Power = HP = <u>Total draft (kg) x speed (m/min)</u> $\qquad\qquad\qquad\qquad$ 4500 Total draft = 1700 kg Speed = 5.5 km/h = 5.5 x 1000/60 (m/min) = 91.66 m/min Therefore $\qquad$ HP = (1700 x 91.66)/4500 = 34.61 HP = 25.82 KW (multiply HP by 0.746)
SECTION-B
	(Write the answers in one sentence only. Each question carries 2 marks)
Q. 6	(Answer in one sentence/Do as directed/Define)
	a) Enlist the different sowing methods **Ans :**The different sowing methods are (i) Broadcasting, (ii) Dibbling, (iii) Drilling, (iv) Seed dropping behind the plough, (v)Transplanting, (vi) Hill dropping and (vii) check row planting

	b) What is hand hoe. **Ans-:** Hand hoe is the most popular manually operated weeding tools used in the farm. It consists of iron blade and wooden handle
	c) Write the different types of tillage **Ans-:** The different types of tillage are i)Minimum tlllage ii)Strip tillage iii)Rotary tillage and iv) mulch tillage
	d) What do you mean by farm mechanization **Ans-:** Farm mechanization is application of engineering and technology in agricultural operations to do a job in better way to improve productivity. This means maximum use of advanced farm machinery
	e) Define gang angle **Ans-:** The angle between the axis of gang and the line perpendicular to the direction of travel is called gang angle
	f) Write the functions of planter **Ans-:** The functions of planter are 1. To open the furrow 2. To meter the seed 3. To deposit the seed in the furrow and 4. To cover the seed and compact soil over it
	g) Define threshing **Ans-:** Threshing is the process of detaching grains from earheads or from plants

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SECTION-C

(Choose the correct option. Each question carry 1 mark)

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Q. 7	**1) (b) Plough**
	2) (c) Gudgeon pin
	3) (a) Cono weeder
	4) (c) Transplanting
	5 (a) Fixed cost
	6) (d) share
	7) (b) Knap-Sack duster
	8) (c)Air-cooled engines
	9) (b) planters
	10) (c) one- tenth

11) (b) mower	
12) (b) Scraper	

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