# STRATEGIES FOR ENHANCEMENT IN FOOD PRODUCTION

### **BIOLOGY**

## Single Correct Answer Type

1.	The cultivation of aquat	ic animals or plants for foc	od is called			
	a) Aquaculture	b) Pisciculture	c) Sericulture	d) Apiculture		
2.	Differentiation of organ	s and tissues in a developi	ng organism is associated w	rith		
	a) Developmental muta	tions	b) Differential expression	on of genes		
	c) Lethal mutations		d) Deletion of genes			
3.	Triticale is obtained by	crossing wheat with:				
	a) Oat	b) Barley	c) Maize	d) Rye		
4.	Essential oils are made	of:				
	a) Vitamins		b) Auxins	07		
	c) Trace elements		d) Aromatic volatile org	anic substances		
5.	Mule is produced by					
	a) Inbreeding		b) Artificial inseminatio	n		
	c) Interspecific hybridiz	zation	d) Intraspecific hybridiz	ation		
6.	Rearing and breeding of	f fish in ponds, tanks and a	rtificial reservoirs is called:			
	a) Aquaculture	b) Fishing	c) Pisciculture	d) Apiculture		
7.	Bee wax is a product of	importance				
	a) Industrial	b) Domestic	c) Medicinal	d) All of these		
8.	In 1963 during green re	volution the increase in cr	op production of wheat was	s due to the introduction of		
	a) Semi-dwarf varieties of wheat					
	b) Jaya and Ratna	C				
	c) Both (a) and (b)					
	d) Sonalika and Kalyan	Sona				
9.	Safflower oil is obtained	l from the seeds of:				
	a) Linum usitatissimus	m	b) Lelianthus annus			
	c) Sesamum indicum	4 1 4 1	d) Carthamus tinctorii	ıs		
10.	Which of the following i	of the following is the main aim of evaluation of germplasm in plant breeding program?				
	a) To identify plants with desirable combination of characters					
	b) For effective exploita	tion of the natural genes				
	c) Both (a) and (b)					
	d) For collection of varia	<del>-</del>				
11.	Spawning in fishes can l	oe induced by:				
	a) TSH	b) Thyroxine	c) FSH and LH	d) STH		
12.	An old breeding techniq					
	a) Introduction	b) Selection	c) Mutation breeding	d) Hybridisation		
13.	The botanical name for	=				
	a) Indigof era tinctorio	a	b) Crotolaria juncea			
	c) Arachis hypogea		d) Astragalus gummif	er		
14.	Saccharum barberi wa					
	a) East India	b) West India	c) North India	d) South India		
15.	<del></del>	s, to improve food quality				
	<del>-</del>		al requirements in the worl			
			s, vegetables, legumes, fish a	and meat and thus suffer from		
	deficiencies or hidden h	_				
	III. essential micronutri	ents are absent from diet				

	Choose the correct opt	ion				
	a) I and II	b) I and III	c) II and III	d) I, II and III		
16.	Mating between two in	ndividuals differing in ge	enotypto produce genetic v	ariation is called		
	a) Domestication	b) Incubation	c) Hybridization	d) Mutation		
17.	The cotton fibre from	the cotton plant is obtain	ned from:			
	a) Roots	b) Stems	c) Seeds	d) Leaves		
18.	The cheapest high ene	rgy crop of India is:				
	a) Apple	b) Guava	c) Mango	d) Banana		
19.	Emasculation of flowe	rs is carried out through	n removal of:			
	a) Sigma	b) Sepals and petals	s c) Anthers	d) Entire organism		
20.	In protoplast fusion, th	ne enzymes required are	2			
	a) Cellulose, hemicellu	lose, pectinase				
	b) Pectinase					
	c) Ligase, hemicellulos	se				
	d) Hemicellulose					
21.	Cows and buffaloes re	main in heat for:				
	a) 24-36 hours	b) 36-48 days	c) 7-10 days	d) 15-20 days		
22.	According to NCERT to	ext, which of the following	ng are selection and testing	g of superior recombination in		
	plant breeding?					
	a) It involves selection	of plants amont the pro	ogeny of the hybrids with d	lesire combination of characters		
	b) The hybrid are supe	erior to both the parents	s this is called hybrid vigou	r		
	c) They are self-pollin	ated for several generat	ions till they rich a stable o	of uniformily or homozygosity in		
	order to ovoid the s	egregation of characters	s in the future progeny			
	d) All of the above		$\mathcal{L}_{\lambda}$			
23.	Which of the following	shows correct chronolo	ogical order of the events o	ccurring during callus culture?		
	a) Callus → Cell division	$on \rightarrow Explant \rightarrow Addition$	of cytokinin $\rightarrow$ Cells acqui	re meristematic property		
	b) Explant → Cell divis	ion → Addition of cytok	inin $\rightarrow$ Cells acquire merist	ematic property		
	c) Explant $\rightarrow$ Cell divis	ion $\rightarrow$ Callus $\rightarrow$ Addition	n of cytokinin $ ightarrow$ Cells acqui	re meristematic property		
	d) Callus $\rightarrow$ Explant $\rightarrow$	Cell division → Addition	n of cytokinin → Cells acqui	re meristematic property		
24.	Which of the following	g organisms is useful for	us?			
	a) Musca	b) <i>Bombyx</i>	c) Pheretima	d) Periplaneta		
25.	The part of the grain in	n cereals, where much o	f the protein lies is the:			
	a) Aleurone	b) Endosperm	c) Pericarp	d) Embryo		
26.	In crop improvement j	programme haploids are	e important because they:			
	a) Require one half of	nutrients				
	b) Are helpful in study of meiosis					
	c) Grow better under	adverse conditions				
		zygous individuals on di	_			
27.	The honey bees exhibi	t a type of dance to com	municate the location of fo	od. This is known as:		
	a) Tap dance		b) Round dance an	d waggling dance		
	c) Break dance		d) Waggle dance			
28.	The plant cell without	the cell wall is called				
	a) Protoplast	b) Cytoplast	c) Nucleoplast	d) None of these		
29.	The capacity of a cell e	explant to grow into a wh	hole plant is called			
	a) Plant culture	b) Tissue culture	c) Cellular totipote	ncy d) All of these		
30.	Close inbreeding usua	lly results in reduction o	of fertility and productivity	. This is called		
	a) Homozygosity		b) Outbreeding			
	c) Inbreeding depress		d) Outbreeding dep	oression		
31.	Read the given statem	ent about outcrossing				
	I. It is the breeding h	etween of animals with	in the same breed but d	o not have common ancestors		

either side of their pedigree up to 4-6 generation

	II. It is done to increase i	milk production and grov	vth rate in animals	
	Which of the statement §	given above is incorrect?		
	a) Only I	b) Only II	c) I and II	d) None of these
32.	is a phenomenon by	which genetic variations	is achieved through chan	ges in the base sequences with
	in genes, which creates a	new character or trait a	bsent in parental generat	ion
	a) Apomixis	b) Mutation	c) Mutation breeding	d) Heterosis
33.	Methods of breeding for	acquiring disease resista	nce are	
	I. conventional breeding	techniques		
	II. mutation breeding			
	III. radiation breeding			
	Chose the correct option	1		
	a) I and II	b) I and III	c) I only	d) III only
34.	Word livestock refers to			
	a) Sheep and goat only		b) Pigs and camels or	nly
	c) Cattle and buffaloes o	nly	d) All of these	
35.	The animal most useful		•	
	a) Mule	b) Yak	c) Camel	d) Elephant
36.	Which of the following s	=		· ·
	I. improved growth rate			
	= =	of milk, meat, egg, wool,	etc.	
	III. superior quality of m			
	IV. improved resistance			
	Choose the correct option			
	a) I and II	b) I, II and III	c) II, III and IV	d) I, II, III and IV
37.		•	c) II, III dila I v	a, 1, 11, 111 and 17
07.	a) Pig	b) Donkey	c) Mule	d) Yak
38.	, ,	-		,
00.	a) Feeding cattle, pigs ar		morpany about for	
	b) Preparation of paints			
	c) Clarification of vinega			
	d) Production of insulin			
39.			explant/cell is	
07.	a) Pectinase	b) Catalase	c) Ligninase	d) Maltase
40.	The parameters carried		, ,	a) Marcase
10.	-			tial and resistance to diseases
	II. regular visits by a vet		aving ingli yleianig poten	ciar and resistance to discuses
	III. each animal should b	-		
		l animal management and	d general supervision	
	Which of the above state	•	a general super vision	
	a) I and II	b) I, II and III	c) II, III and IV	d) I, II, III and IV
4.1	Ambergis is the secretion	=		=
т1.	cosmetics:	ii ii oiii tiic iiitestiiie oi	used in the manufacture	e of perfumes and other
	a) Tachyglossus- <i>Echidn</i>	a	b) Physetter-Sperm v	whala
~	c) Musk-Deer	u	d) Kangaroo- <i>Macrop</i>	
12	Hisardale is a new bree	d of A daysland in D	, , ,	
42.	Here A and C refers to	u orA uevelopeu iii r	ulijab by crossiligb al	iuc
		woo C Marina rama	h) A chickon P Dork	ing C Suggey
	a) A-sheep, B-Bikaneri e		b) A-chicken, B-Dork	•
12	c) A-chicken, B-leghorn,	<del>-</del>	d) A-cow, B-Jersy, C-l	OMII 2MI2
43.	Economic importance of	nsn meiddes		
	I. fish as food			
	II. source of income			

	III. aesthetic value			
	Which of the above are co			
	a) I and II	b) I and III	c) II and III	d) I, II and III
44.	Lysine and tryptophan ar	re		
	a) Proteins			
	b) Non-essential amino a	cids		
	c) Essential amino acids			
	d) Aromatic and no acids			
45.		sease resistance enhancem	ent introduced by mutation	n in moong bean?
	I. Yellow mosaic virus			$\wedge$
	II. Powdery mildew			<b>A A A A B</b>
	III. Black rust			
	Choose the correct option			
	a) I and II	b) I and III	c) II and III	d) I, II and III
46.		l of breeding for resistance	includes	0 7
	I. screening the germplas			
	II. hybridization of selecte	_	4 ( 4	<b>Y</b>
	III. selection and evaluation			7
	IV. testing and release of			
	Choose the correct option			15 1
	a) I, II and III	b) I, III and IV	c) II, III and IV	d) I, II, III and IV
47.	= = =	al breeding is to breed such	animals which are able to	produce
	a) Qualitative increase in	=	A \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	
	b) Quantitative increase i			
	c) Marketing of animal pr	roduct		
	d) Both (a) and (b)			
48.	The scientific name of ma		) D 1	D. D.
40	a) Zingiber	b) Zea mays	c) Raphanus	d) Daucas
49.		icreased resistance power i	n crops?	
	I. Enhance production	go on fungicides and bacter	riacidas	
	<del>-</del>	ce on fungicides and bacter nce on technical agricultura		
	Choose the correct option	_	11 10015	
	a) I and II	b) I and III	c) II and III	d) I, II and III
50	The insect that is not four		c) ii aliu iii	uj i, ii aliu iii
50.	a) Lac insect	b) Cochineal insect	c) Honey bee	d) Silk moth
51	Aim of plant breeding is t		c) Honey bee	u) siik iilotii
01.	a) Disease free varieties	.o gr o w	b) High-yielding varieties	<b>!</b>
	c) Early-maturing varieti	es	d) All of the above	
52.	Which of the following is		a) This of the above	
J	a) Helianthus annus	b) Cocos nucifera	c) Arachis hypogea	d) Phaseolus aureus
53.		eat suitable for Indian envi		-
	a) Euploidy and cloning		b) Hybridization and mut	
	c) Polyploidy and hybrid	ization	d) Cloning and polyploidy	
54.				ams and polishes of various
		ate word for filling the blar	=	1
	a) Bee wax	b) Honey	c) Latex	d) Resin
55.	A milch breed of cow is:	•	•	
	a) Haryana	b) Malvi	c) Kankrej	d) Halliker
56.		cludes catching processing		•
	a) Fisheries	b) Apiculture	c) Sericulture	d) None of these

57.	The embryo which develo	ps from somatic cell is call	led	
	a) Somatic embryo		b) Reproductive embryo	
	c) Clone embryo		d) None of these	
58.	Hinny is a cross breed bet	ween:		
	a) Male donkey and femal	le horse	b) Female donkey and ma	ale horse
	c) Male mule and female l	norse	d) None of these	
59.	Science of altering the gen	netic pattern of plants in or	der to increase their value	and utility for human
	welfare is called			
	a) Plant breeding	b) Agriculture	c) Plant genetics	d) All of these
60.	Which one of the followin	g is the American poultry l	oreed?	
	a) Australorp	b) Rhode Island Red	c) Minorca	d) Aseel
61.	Compared to a bull a bullo	ock is docile because of:		
	a) Higher levels of cortiso			A . Y
	b) Lower levels of blood to			
	•	lin/noradrenalin in its bloo	od	
	d) Higher levels of thyrox			
62.	Maximum cocoon and raw			
	a) China	b) Japan	c) U.S.S.R	d) Brazil
63.			elding breed of the poultry	,
	a) Aseel	b) White leghorn	c) Giriraja	d) Plymoth rock
64.	•	, ,	used in cosmetics and polis	
0 11	a) Honey	b) Oil	c) Wax	d) Royal jelly
65.	•	•		-, -, -, -, -
	a) IR-8	b) Taichung Native-1	c) Both (a) and (b)	d) Jaya and Ratna
66.	Largest silk producing sta	,	o) = 0 (a) (b)	, ,,
	a) Karnataka	b) Bihar	c) Assam	d) West Bengal
67.	Larval form of silk moth is	•	, , , , , , , , , , , , , , , , , , , ,	-,
	a) Naiad	b) Maggot	c) Caterpillar	d) Wriggler
68.	Bhutia is a breed of:	5) 1148850	e) date: p.mar	w)
	a) Chicken	b) Goat	c) Sheep	d) Horse
69.			and reared for high econor	•
	a) Apis indica	b) Apis mellifera	c) Apis dorsata	d) Apis florea
70.	Passive, non-locomotory a	, ,		.,,
	a) Caterpillar	b) Imago	c) Nymph	d) Pupa
71.	Regulations governing mo	, ,		, 1
	a) Crop protection	b) Quarantine	c) Plant regulation	d) Rotation
72.	, , ,		vorld over can be said to be	
	a) Robert Koch	b) Leeuwenhoek	c) Louis Pasteur	d) Blackmann
73.	Teak is obtained from pla		-,	-,
	a) Shorea robusta	b) Mangifera indica	c) Tectona grandis	d) Cedrus deodora
74.	Which of the following is a		-,	.,
	a) Vicia faba	b) Phaseolus aureus	c) Cassis fistula	d) Cajanus cajan
75.	In tissue culture, roots car			
7 0.		f cytokinin and higher cond	centration of auxins	
	b) Only cytokinin and no a			
	c) No cytokinin and only a			
		f cytokinin and lower conc	rentration of auxins	
76	Blue revolution	. o, commin and lower conc	ond adon of advilla	
, 0.		intensive commercial aqu	aculture	
	<del>-</del>	oduction and reduce wides		
	<del>-</del>	given above is/are correct?	=	
		,		

	a) Only I	b) Only II	c) I and II	d) None of these
77.	Cryopreservation is usefu	l for:		
	a) Preservation of semen		b) Very young foetuses	
	c) Living cells and body p	arts	d) All the above	
78.	Keeping beehives in crop	field during flowering perio	od increases	
	a) Honey and wax yield	b) Crop yield	c) Both (a) and (b)	d) Pollination in wheat
79.	New varieties of plants ca	n be produced by:		
	a) Selection and hybridization	ation		
	b) Subjecting them to very	·		
	c) Subjecting them to dos	es of radiation and selectio	n	
	d) Subjecting them to con			
80.	Hidden hunger can be def			
		able to buy enough fruits, v	egetables, legumes, fish an	d meat and thus suffer
	from deficiency	1 10 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		4/ }
	_	ıy healthy drink item and t	_	
		ly vitamin and minerals me	edicines and thus suffer fro	m deficiency
01	d) All of the above Pure line breeds refer to:		4 4	
01.	a) Homozygosity and inde	anandant accortment	b) Homozygosity only	
	c) Heterozygosity	ependent assortment	d) Heterozygosity and linl	22.G0
82.		ch Institute (IRRI) is situat		Nage
02.	a) New York (USA)	b) Tokyo (Japan)	c) Manilla (Philipines)	d) Hydrabad (India)
83.	Pomato is a somatic hybri		o) Hamma (Himpines)	a) 11) ar abaa (111ana)
	a) Potato and onion	b) Potato and tomato	c) Potato and brinjal	d) Potato and garlic
84.	Real product of apiculture	-		, 0
	a) Honey	b) Bee wax	c) Both (a) and (b)	d) Sugar
85.	Protoplasts of two differe	nt species are fused in		
	a) Miropropagation		b) Somatic hybridization	
	c) Clonal propagation		d) Organography	
86.	The largest groundnut pro	oducing country is:		
	a) U.S.A.	b) Brazil	c) India	d) Burma
87.		e resistant variety will star		
	a) Working out yield of di	fferent varieties	b) Go through the subject	in library
00	c) Selection of parents		d) Hybridisation	
88.	Which one of the followin	=	) C	l) D
00	a) Eggs	b) Caterpillar	c) Cocoon	d) Pupa
09.	Self pollination results in: a) Heterosis		b) Hybridisation	
	c) Polyploidy		d) Inbreeding depression	
90.	, , , , , ,	ped for green revolution in		
<i>)</i> 0.	a) Maize	b) Rice	c) Wheat	d) Bajra
91.	Animal husbandry deals v	•	c) whole	aj Bajra
	•		s, etc., that are useful to hu	mans
	-	g, etc., of fish, molluscs and		
	III. breeding of fowls for h	iuman use		
	Which of the statement gi	ve above are correct?		
	a) I and II	b) I and III	c) II and II	d) I, II and III
92.	Rate of mutations is induc	ced by means of certain age	ents called	
	a) Mutagens	b) Carcinogen	c) Oncogenes	d) None of these
93.		ct about centre of origin of	=	
	a) More diversity in impr	oved variety	b) Frequency of dominant	t gene is more

94.	c) Climatic condition more favourable Consider the following statements	d) None	
	I. Breeding of animal is very important for animal hus	sbandry	
	II. Both the male and female animals selected for bree	=	quality
	III. The word 'husbandry' means the management of		
	IV. In our country, poultry mainly means chickens, do		
	V. Cows and buffaloes generally give more milk than		
	VI. The yellow colour of buffalo milk is due to caroter	= <u>=</u>	
	Which of the statement given above are true and whi		
	I II III IV V VI		
	a) F F T T F F b) T T F F T F	c) T T T F T F	d) F T F T T F
95.	Emasculation is removal of:		
	a) Stigma from flower of male parent	b) Calyx from flower of ma	ale parent
	c) Calyx from flower of female parent	d) Stamens from flowers of	of female parent
96.	Lac is:		
	a) Excretion of lac insect	b) Dead body of lac insect	
	c) Body secretion of lac insect	d) None of the above	<b>Y</b>
97.	The most common egg-type variety used for commer	cial production through ou	
	a) Leghorn b) Plymoth rock	c) Cornish	d) New Hampshire
98.	In livestock breeding experiments which of the follow		surrogate mothers
	a) Unfertilized eggs	b) 2 celled embryo	
	c) Fertilised egg	d) 8 to 32 celled embryo	
99.	High yielding variety of rice is:		
	a) Dhann b) IR-8	c) Tripsacum	d) Digitaria
100.	A tool in crop improvement involving identification of	\ <del>-</del>	
	a) Protoplast fusion and tissue culture	b) Somaclonal hybridisation	on
101	c) Gene bank technology	d) Genetic engineering	
101.	The part of the plant taken for tissue culture is called		J) Dath (b) and (a)
102	a) Inplant b) Explant	c) Transplant	d) Both (b) and (c)
102.	Which one is a rich source of vitamin-A?  I. Carrot II. Lemon		
	III. Beans IV. Spinach		
	Choose the correct option		
	a) I and II b) I and III	c) I and IV	d) I, II, III and IV
103.	A group of animals which are related by descent and	•	=
	a) Breed b) Race	c) Variety	d) Species
104.	A good germplasm collection is essential for		<i>y</i> 1
	a) A successful breeding programme		
	b) Hybridization		
	c) Selection of plant		
	d) Emasculation		
105.	The milch breeds of cattle are?		
	a) Mallikar, Nageri and Malvi	b) Gir, Sahiwal and Deoni	
	c) Kankrej, Haryana and Ongole	d) Tharparkar and Kangay	/am
106.	Which one is the best silk?		
	a) Eri silk b) Mulberry silk	c) Tasar silk	d) None of the above
107.	In order to obtained disease free plants through tissu		<del>=</del>
	a) Embryo culture b) Protoplast culture	c) Meristem culture	d) Anther culture
108.	Which one of the following combination would a sugar		ne sugarcane crop?
	a) Thick stem, long internodes, high sugar content an		
	b) Thick stem, high sugar content and profuse flower	ring	

c) Thick stein, short	internoues, mgn sugar com	tent, disease resistant	
d) Thick stem, low s	ugar content, disease resist	ant	
109. Hardening in tissue	culture is		
a) Keeping 30°-50°C	temperature for about 30 i	minutes	
b) Acclimatization o	f tissue culture plants slowl	y before growing in the fiel	d
c) Plunging the vials	s into water at 37°-40°C		
d) None of the above	è		
110. Fibre yielding plant	is:		
a) <i>Triticum</i>	b) Gossypium	c) Pennisetum	d) Rauwolfia
111. A draught breed of c	attle is:		
a) Red Sindhi	b) Gir	c) Malvi	d) Haryana
112. In plant breeding pr	ogrammes, the entire collec	ction of (plants/seeds) havi	ng all the diverse alleles for all
genes in a given crop	o is called:		
a) Cross-hybridisati	on among the selected pare	nts	
b) Evaluation and se	election of parents		
c) Germplasm collec	ction		
d) Selection of super	rior recombinants		
113. Mutation breeding is	s carried out by		
I. inducing mutation	s in plants by various mean	S	
II. screening the plan	nt for resistance		
III. selecting the des	irable plant for multiplication	on and breeding	
Choose the correct of	ption		
a) I and II	b) I and III	c) II and III	d) I, II and III
114. Saccharum barberi	was grown inA India h	adB sugar content and	yield. Saccharum of ficinarun
did grow inC Inc	dia, had thicker stem andI	D sugar content. Here A to	D refers to
a) A-North, B-poor,	C-South, D-higher	b) A-South, B-higher,	, C-North, D-poor
c) A-East, B-poor, C-	West, D-higher	d) A-West, B-higher,	C-North, D-poor
115. Which one of the fol	lowing is not an important l	Indian millet?	
a) Sorghum vulgare	?	b) Pennisetum typh	oides
c) Eleusine coracar	ıa	d) None of the above	
116. Murrah is a breed of			
a) Cow	b) Sheep	c) Buffaloes	d) Goat
117. Solid stem in wheat	exhibits non-preference by		
a) Jassids	b) Fruit borer	c) Stem borer	d) Stem sawfly
118. Pearl oyster belongs	to class:		
a) Gastropoda	b) Pelecypoda	c) Scaphopoda	d) Amphineura
119. Artificial inseminati	on is better than natural ins	semination in cattle because	2:
a) Semen of good bu	ılls can be provided everyw	here	
b) There is no likelih	nood of contagious diseases		
c) It is economical			
d) All the above			
120. The dry fibrous resid	due left after the extraction	of sugarcane juice is known	n as:
a) Molasses	b) Bagasse	c) Massecuite	d) None of the above
	<del>-</del>	omA tonnes toB tor	nnes while rice production was
fromC tonnes to	D tonnes		
Here A to D refers to	)		
<u> </u>	5 million, C-35 million, D-89		
	0 million, C-40 million, D-92		
=	1 million, C-35 million, D-89		
	0 million, C-40 million, D-90	) million	
122. Emasculation is rela	ted to		

123.	a) Pureline It is now possible to breed	b) Mass selection I plants and animals with d	c) Clonal selection esired characters through:	d) Hybridization
	a) Ikebana technique	•	b) Tissue culture	
	c) Genetic Engineering		d) Chromosome Engineer	ing
124.	Common wild rock honey	bee is:	_	
	a) Apis mellifera	b) Apis indica	c) Apis dorsata	d) None of the above
125.	Anatomically, cotton fibre	s are:		
	a) Bast fibres	b) Xylem fibres	c) Epidermal hairs	d) Pith cells
126.	Which of the following is o	considered as the root of an	y breeding program	
	a) Genetic variability	b) Cross hybridization	c) Hybrid vigour	d) Heterosis
127.	India's wheat yield revolu	tion in the 1960s was possi	ible primarily due to	
	a) Hybrid seeds			
	b) Increased chlorophyll c	ontent		
	c) Mutations resulting in p	plant height reduction		
	d) Quantitative trait muta	tions		
128.	Triticale has been develo	ped through intergeneric h	ybridization between:	
	a) Wheat and Rye/Secale		b) Wheat and Aegilops	
	c) Wheat and Rice		d) Rice and Maize	
129.	In tissue culture method, t	the embryoids formed from	pollen grain is called	
	a) Cellular totipotency	b) Organogenesis	c) Triple fusion	d) Callus culture
130.	Microbes like Spirulina ca	an be grown on material lik	ce	
	I. waste water from potato	processing plants		
	II. straw			
	III. animal manure and sev	wage		
	IV. molasses			
	Choose the correct option		>	
	a) I and II	b) I, II and III	c) II, III and IV	d) I, II, III and IV
131.	Technique of silk producti	on from the cocoons of silk	worms was first known to	:
	a) India	b) China	c) United Kingdom	d) U.S.A.
132.	Indian rubber tree belong	s to:		
	a) Euphorbiaceae	b) Malvaceae	c) Tiliaceae	d) Moraceae
133.	The controlled breeding a	nd rearing of fish is called		
	a) Aquaculture	b) Pisciculture	c) Sericulture	d) Apiculture
134.	The hexaploid wheat spec	ies from which modern typ	es of wheat have been dev	eloped:
	a) Triticum boeticum	b) Triticum spelta	c) Triticum aestivum	d) Triticum squarrosa
135.	Wonder wheat is new who	eat variety developed by		
	a) Mexico's International	Wheat and Maize Improver	nent Centre	
	b) Indian National Botanio	cal Research Institute		
	c) Australian Crop Improv	vement Centre		
	d) African Crop Improvem	ient Centre		
136.	Somatic hybridization is a	technique of		
	a) Natural breeding	b) Natural pollination	c) Artificial pollination	d) Artificial breeding
137	Some plants developed by	meristem culture are		
	a) Banana	b) Sugarcane	c) Potato	d) All of these
138.	Culturing of isolated plant	organ is called		
	a) Explant culture	b) Inplant culture	c) Organism culture	d) Organ culture
139.	A man-made allopolyploid	l cereal crop is		
	a) <i>Hordeum vulgare</i>	b) <i>Triticale</i>	c) <i>Raphanobrassica</i>	d) <i>Zea mays</i>
140.	. Honey			
	I. is a natural valuable ton	ic for human body		
	II. contains various subs	tances of high medicinal	value, including importa	nt enzymes, vitamins and

	disaccharide sugars main	lly glucose and fructose c medicines are taken with l	honev	
	Which of the statement g		noney	
	a) I and II	b) I and III	c) II and III	d) I, II and III
141	,	ainly deficient in which typ		aj i, ii alia iii
141.				
		ino acids-methionine and c	ysteme	
	b) Tryptophan			
	c) Both (b) and (c)			
1 1 2	d) Lysine			A))
142.	Which one of the following		1301 : 1:	$\wedge$
	a) Foot and mouth diseas	Se .	b) Pebrine disease	4 7
4 40	c) Anthrax	1	d) Ranikhet disease	
143.	<del>-</del>	nore numbers of female pla	= = =	
	a) Spraying ethephon	b) Genetic engineering	c) Polyploidy breeding	d) Tissue culture
144.	Callus can form shoot or	root by changing ratio of:		
	a) Auxin to gibberellin		b) Auxin to cytokinin	X.
	c) Cytokinin to ethylene		d) Gibberellins to cytokini	n
145.	Gestation period for buffa			
	a) 9 months	b) 14 months	c) 10 months	d) 21-22 months
146.		erminating pollen grain will		
	a) Diploid	b) Haploid	c) Triploid	d) Tetraploid
147.	The scientific name of lac	insect is:		
	a) Tachardia lacca	b) Bombyx mori	c) Cimex lectularis	d) Pediculus pithiris
148.		cross hybridization is a tim	_	
	<ul><li>a) Pre-existing genetic va crop species</li></ul>	riability is collected from w	vild varieties, species and re	elatives of the cultivated
	= =	n of plants among the proge	any of the hybride with dec	ired combonation of
	characters	if of plants among the proge	city of the hybrids with des	area componation of
		on and bagging techniques	to transfer desired nollen ø	rains to a desired plant
	d) Both (a) and (b)	on and bagging teeninques	to transfer desired ponen g	rams to a desired plant
149	. , , , , , ,	ns are usually maintained at	ta A temperature in the	form of R Here A and
	B refers to	is are assumy mameamed as	ta mrim temperatare m me	Torm or momentume
	a) A-low, B-plant	b) A-low, B-seed	c) A-high, B-plant	d) A-high, B-seed
150	Tassar silk moth belongs		e, ii iiigii, b piaire	a) II iiigii, b seea
100.	a) Bombycidae	b) Sturnidae	c) Hymenoptera	d) Diptera
151	GDP stands for	b) otal made	e, nymenopiera	a) Diptera
101.	a) Gross Domestic Produc	rt	b) Grant Domestic Payme	nt
	c) Grant Domestic Production		d) Gross Domestic Payme	
152	1	lesearch Institute, New Dell	•	
152.	are rich in vitamins and n	·	ii nas reicasca severai ioi ti	nea vegetable crops that
	I. Vitamin-A enriched car			
1		ter gourd, bathua, mustard	tomato	
	III. Iron and calcium enric	=	tomato	
		d beans, French bean, garde	an naa	
	Choose the correct option	_	en pea	
			a) II III and IV	d) None of those
152	a) I, II and III The percentage of protein	b) I, III and IV	c) II, III and IV	d) None of these
133.	The percentage of protein		c) 640%	d) 700%
1 🗆 🗸	a) 12% Norin 10 gone of dwarfne	b) 35%	c) 64%	d) 70%
134.		ess in wheat was originated		4) IICCD
155	<ul><li>a) India</li><li>Which one is not included</li></ul>	b) Japan d in animal husbandry?	c) Mexico	d) USSR
1 . 1 . 1	- vv anch one is not the note:	a in annual huspallul v!		

II. Fish farming		
III. Organic farming		
IV. Molecular farming		
Codes		
a) I and II b) I and III	c) II and III	d) III and IV
156. The inherent capacity of a cell to regenerate a new	whole organism is called	
a) Ontogeny b) Totipotency	c) Phylogeny	d) Proliferation
157. The botanical name of sweet flag, commonly used a	is antispasmodic, expectora	int and remedies for asthma
and chronic diarrhoea is:		
a) Berberis aristaat b) Ferula asaf oetida	c) Acorus calamus	d) Gentiana lutea
158. In India the best aquarium is located at:	•	
a) Z.S.I. Kolkata b) Tarapur, Mumbai	c) Chennai	d) Vishakhapatnam
159. The method of growing or producing thousands of	•	
a) Totipotency b) Somaclones	c) Micropropagation	d) Macropropagation
160. In mutation breeding, mutations are induced by us		17 17 18 11
a) Aniline b) Alcohol	c) Graphene	d) Both (a) and (b)
161. Improved varieties of wheat suitable for Indian clir		
a) Hybridisation and mutation	b) Mutation and cloning	
c) Cloning of polyploids	d) Polyploidy and hybrid	lisation
162. <i>Spirulina</i> is a	a) I oly piolay and hybric	asacion
a) Cyanobacteria b) Fungi	c) Protozoan	d) Brown algae
163. The method maximum used in cattle breeding is:	c) I I otozodn	a) brown algae
a) Random breeding	b) Artificial insemination	1
c) Controlled breeding	d) Super ovulation and e	
164. The nutrient medium for tissue culture should have		moryo transpiant
I. sucrose		
II. inorganic salts		
III. growth regulators		
IV. vitamins		
V. amino acids		
Choose the correct option	c) I II III and IV	d) I II IV and V
a) I, II, III, IV and V b) II, III, IV and V 165 Which of the following plants is an oil as well as fib	c) I, II, III and IV	d) I, II, IV and V
165. Which of the following plants is an oil as well as fib a) <i>Linum usilatissum</i> b) <i>Sesamum indicum</i>		d) Pragaiga ismaag
	c) Helianthus annus	d) Brassica juncea
166. Choose breeding		h h
I. refer to the cross of superior male of one breed w	<del>-</del>	ner breed
II. it helps of accumulate the desirable genes of the		
III. the progeny may be used for commercial produ	ction	
Which of the statements given above are correct?	) w 1 m	15 7 77 1 777
a) I and II b) I and III	c) II and III	d) I, II and III
167. Which one of following is our indigenous breed of o		
a) Plymouth Rock b) White Leghorn	c) Aseel	d) Rhode Island Red
168. Strategic steps for inbreeding are		
I. identify superior male and superior female of the	same breed	
II. these are than mated in pair		
III. evaluate the progeny obtained from the mating		
IV. In cattle superior female is the cow or buffalo t	hat produce more milk per	· lactation and superior male
is the bull that gives rise to superior progenies		
V. Superior progenies obtained are further mated		
Arrange the above given steps in correct sequence	and select the correct answ	rer

I. Poultry farming

b) $I \rightarrow II \rightarrow III \rightarrow IV \rightarrow V$	
d) III $\rightarrow$ II $\rightarrow$ I $\rightarrow$ V $\rightarrow$ IV	
r animal and human nutrit	ion formed from certain
h) Mathylanhilya mathyl	otrophus
	otrophus
•	nutrients is called
	d) Bioremediation
	d) Mysore
	u) Mysore
<del>-</del>	d) Bollworm
c) vii us	u) bollworlli
h) Cowing goods of impro	yod variotics
	veu varieties
•	lactation On the other
-	
oD as compared to thos	se of other males. Here A
c) Nitrogon	d) Magnesium
	u) Magnesium
A Y	d) Japan
	,, 1
•	d) Stem borer
	-
	of cornea or the eye.
	ר
aj Kaawoij ia sei pentina	ı
h) Smut of haira	
a) Nea 10t of sugar carie	
c) Millet	d) Tobacco
•	a) Tobacco
•	d) <i>Apis florae</i>
ej ripis maica	a) Tipis Horae
c) Mustard oil	d) Coconut oil
	•
i used us diffiseptic, a fly fe	penent and modifier in har
b) Calendula of ficinalis	1
=	
c) II and III	d) III and IV
-,	,
c) Beetle	d) Jassids
	d) III → II → I → V → IV r animal and human nutrit  b) Methylophilus methylo d) All of the above ched with certain desirable c) Biofortification ated at: c) Dehradun viding resistance from c) Virus  b) Sowing seeds of impro d) Reduce ration holders at produces more milk per oD as compared to thos c) Mexico and sugar content protec c) Jassids used for removal of opacity b) Gossypium hirsutum d) Rauwolfia serpenting b) Smut of bajra d) Red rot of sugar cane c) Millet be keepers is c) Apis indica c) Mustard oil l used as antiseptic, a fly re b) Calendula of ficinalis d) Helianthus annus are

186.	In crop improvement prog	grammes, virus-free clones	s can be obtained through				
	a) Grafting	b) Hybridization	c) Embryo culture	d) Shoot apex culture			
187.	Stilbesterol is used for:						
	a) Induction of lactation		b) Artificial insemination				
	c) Super-ovulation		d) Cryopreservation				
188.	The callus is not formed in	1					
	a) Tissue culture	b) Suspension culture	c) Clonal propagation	d) Sexual reproduction			
189.	Which is the real product	of Honey bee:					
	a) Honey	b) Pollen	c) Beewax	d) Propolis			
190.	The technique of regenera	ntion of whole plant from a	nny part of a plant by growin	ng it on a suitable culture			
	under aseptic/sterile cond	ditions <i>in vitro</i> is called					
	a) Tissue culture	b) Plant culture	c) Callus culture	d) Seed culture			
191.	Inbreeding is carried out i	n animal husbandry becau	ise it				
	a) Increases vigour	•	b) Improves the breed				
	c) Increases heterozygosi	ty	d) Increases homozygosit	V			
192.	Identify the edible marine	=	,				
	a) Hilsa	b) Pomfret	c) Both (a) and (b)	d) Catla			
193.	•		age annual milk yield per c				
	a) United Kingdom	b) U.S.A	c) Denmark	d) India			
194.	Which of the following is a	•					
	a) Sindhi	b) Deoni	c) Jersey	d) Sahiwal			
195.	The animals that we woul	•	ej jersej	a) balliwai			
1,0.	a) Cows	b) Buffaloes	c) Sheep and goats	d) All of these			
196	Quarantine regulation is n	•	ej encep una goats	a) Im or mose			
1,0.	a) Preventing entry of diseased plants/pathogen/wild plants in the country						
	b) Spraying diseased plan		ina piantes in the country				
	c) Promoting dry farming		<b>Y</b>				
	d) Growing fruit trees in a						
197	Androgenic haploids were		lture for the first time by				
1)/.	a) Bateson	produced from antifer ed	b) Ninan				
	c) Auerbach and Stadler		d) Guha and Maheshwari				
10Ω	Gram belongs to family:	4 1 1	uj dulla allu Malicsilwali				
1 70.	a) Leguminoseae	b) Gramineae	c) Ranunculaceae	d) Solanaceae			
100	, ,		and super-ovulation which	•			
1 ) ).	are administered to the co		and super-ovulation willen	of the following normones			
	a) Follicle stimulating hor		b) Progesterone				
	c) Androgen	mone	d) Oxytocin				
200	Best source for dietary pro	otoin for a vogotarian ic	u) Oxytochi				
200.	a) Soya Bean	b) Gram	c) Groundnut	d) Milk			
201	The various methods of cr	•	c) Groundhut	u) Miik			
201.	I. selection II. Hybridi						
7	III. polyploidy IV. mutation						
	V. genetic engineering	on breeding					
	Choose the correct option						
	<del>-</del>		a) II III IV and V	d) I III IV and V			
202	a) I, II, III, IV and V	b) I, II, III and V	c) II, III, IV and V	d) I, III, IV and V			
202.	Indian Agriculture Resear		a) Dammalawa	d) Chillona			
າດາ	a) Chennai	b) New Delhi	c) Bangalore	d) Shillong			
ZU3.	Apiculture means	h) Doowin = - f = :11	a) Dogwin = after the st	d) Nama - fth			
204	a) Rearing of honey bees		c) Rearing of lac insect	d) None of these			
ZU4.	Ishingless is obtained from		a) Aimhladdan a CCala	d) Claim of all and			
	a) Liver of frog	b) Scales of fishes	c) Air bladder of fishes	d) Skin of shark			

205. T	he advantages of single co	ell proteins are		
I.	easy to grow			
II	. nutrient rich			
II	I. high yield			
C	hoose the correct option			
	<del>-</del>	b) I and III	c) II and III	d) I, II and III
-	, Ieristem culture is practic	•		, ,
	<del>-</del>	b) Haploids	c) Virus-free plants	d) Slow-growing callus
		and disease resistant whea		., 8 8
		b) Kalyan Sona	c) Both (a) and (b)	d) Jaya
		ch surrounds a cocoon is a	, , , , ,	a) jaja
	) 800 to 1200 yards	chi suri ounus a cocoon is c	b) 8000 to 12000 yards	
-	) 800 to 1200 feet		d) 8000 to 12000 yards	A Y
-	the objective of biofortification	ation is to improve	u) 0000 to 12000 metres	
	protein content and qual	_		
	•	ity		
	. oil content and quality			
	I. vitamin content		4 ( 4	
	V. micronutrients and min	ierai content		
	hoose the correct option	1	\	15 * ** *** 1 ***
-		b) I, II and IV	c) II, III and IV	d) I, II, III and IV
	rop improvement is possi	_		
-		f selection, introduction a	nd hybridisation	
-	) Selection			
_	) Scientific improvement	of cultivated plants		
d]	) Introduction			
211. M	laize grain is rich in:			
a)	) Niacin	b) Thiamine	c) Tryptophan	d) Lysine
212. In	n callus culture, roots can	be induced by the supply of	of	
a)	) Auxin	b) Cytokinin	c) Gibberellin	d) Ethylene
213. Se	emi-dwarf varieties of ric	e were developed from		
I.	IR-8 II. Taichung Nativ	ve-1		
II	I. Jaya IV. Sonalika			
C	hoose the correct options			
		b) II and III	c) I and III	d) III and IV
-	ercentage of proteins in t	7.		
		b) 25-50%	c) 40-50%	d) 55-70%
-		ion in 1960s was possible		,
	) Increased chlorophyll co	<del>-</del>	r J	
-	) Mutations resulting in p			
-	) Quantitative trait mutat	=		
1/	) Hybrid seeds	10113		
	he plant from which chew	zing gum is made:		
	) Achras saptoa	ring guin is made.	b) Euphorbia splendens	
_				
_	) Dalbergia sissoo	awls of	d) Butea frondosa	
	uinine is obtained from b		) M 'C ' !'	
-		b) Atropa belladona	c) Magnifera indica	d) Cedrella toona
	the largest land animal is:	12.51	) D1 :	13 P1
-		b) Elephant	c) Rhino	d) Python
			grown in the same pond a	re due to:
-	<del>-</del>	among them for the food	material	
b)	) Their feeding habits are	different		

	c) They live in different habitats		
	d) None of the above		
220.	. Silkworm spins its cocoon:		
	a) From inside to outside	b) Outside to inside	
	c) Random	d) Inside	
221.	Single cell proteins refers to		
	a) A specific protein extracted from pure culture of	f single type of cells	
	b) Sources of mixed proteins extracted from pure of	=	ms or cells
	c) Proteins extracted from a single cell	· ·	
	d) A specific protein extracted from a single cell		
222.	Potato and tomato are native of:		
	a) Canada b) North America	c) South America	d) China
223.	. Which of the following is not an important characte	•	,
	I. Mechanised agriculture	or one green revenue	
	II. Hybrid seeds		
	III. Slash and burn		
	Which of the above are correct?		
	a) Only I b) Only II	c) Only III	d) I and III
224	. A hybrid where the cytoplasm of two parent cell ar	, ,	,
224.	a) Asymmetric somatic hybrid	b) Cytoplasmic hybrid	nie parentai nucieus is caneu
	c) An interbreed	, , ,	wheid
225	Fibres are made of:	d) Symmetric somatic h	ybrid
223.		a) Calaway aharma	d) Callanahama
226	a) Parenchyma b) Chlorenchyma  The deficiency of essential migrapy trionts are sight.	c) Sclerenchyma	d) Collenchyma
226.	. The deficiency of essential micronutrients specially	y iron, iodine, zinc and vita	min-A in 1000
	I. increases risk for disease		
	II. reduces mental ability		
	III. reduces life span		
	Choose the correct option	2.0.1	D I I II
205	a) I, II and III b) I and III	c) Only	d) I and II
227.	For producing protoplasts from pant cells, which o	<del>-</del>	
	a) Amylase and pectinase	b) Cellulase and protein	
	c) Cellulase and pectinase	d) Cellulase and amylas	
228.	. The plants produced from tissue culture are geneti	cally identical to the origin	ial plant from which they are
	grown so they are called		
	a) Somaclones b) Clones	c) Para clones	d) None of these
229.	Which of the statement about breeding is wrong?		
	a) By inbreeding purelines cannot be evolved		
	b) Continued inbreeding, especially close inbreeding		=
	c) Cross-breeding allows desirable qualities of two		
	d) Inbreeding exposes harmful recessive genes tha	<del>-</del>	
230.	. Two temperate cereals, sometimes cultivated at hig	=	
	a) Avena sativa and Secale cereale	b) Zea mays and Eleus	
	c) Panicum milaceum and Coix lachrayma	d) Sorghum bicolour ai	nd Panicum milaceum
231.	. Gambusia is a:		
	a) Predator on mosquito larvae	b) Pest of fishes	
	c) Parasite on crab	d) Pathogenic protozoa	n
232.	. Sugar obtained from sugarcane is:		
	a) Fructose b) Glucose	c) Sucrose	d) Galactose
233.	. When cross is made between two species of the sai	me genus, then the cross is	known as
	a) Intraspecific hybridization	b) Interspecific hybridiz	
	c) Intergeneric hybridization	d) Intervarietal hybridiz	zation

234. Vegetables are chief source of:		
a) Fats and minerals	b) Fats and vitamins	
c) Minerals and vitamins	d) Proteins and vitamins	5
235. The entire collection having all the diverse alleles for	or all genes in a given crop	is called
a) Gene collection b) Germ collection	c) Germplasm collection	d) Plasma collection
236. The chances of catching bird flu from a properly co	oked (above 100°C) chicke	n and eggs are
a) Very high b) High	c) Moderate	d) Nil
237. Undifferentiated mass of plant cells grown on nutri	ent medium, is called	
a) Callus b) Bud	c) Clone	d) Scion
238. The totipotency of a cell refers to the	•	
a) Flowering in a culture medium		
b) Development of fruit from a flower in a culture n	nedium	
c) Development of an organ from a cell in culture m		A Y
d) Development of all tissues of all kinds from a cell		
239. A milk-like preparation can be made from the seeds		
a) Gram b) Soyabean	c) Grapes	d) Barley
240. Increase in food production is necessary because of	, .	a) barrey
a) The better land available	b) The population increa	926
c) The increased money power	d) The better irrigation	
241. Silk glands are modified:	d) The better irrigation	idemities
a) Salivery glands b) Anal glands	c) Colleterial glands	d) Mushroom glands
242. Consider the following statements	c) confeter at gianus	u) Musiii ooni gianus
	rom gavyfly	
I. Solid stem in wheat exhibits non-preference by st	A 1/ 4	
II. In cotton, smooth leaf and absence of nectar repe		wan atam banana
III. In maize, high aspartic acid, low nitrogen and su	igar content protect them i	Tolli Stelli borers
Which of the statements given above are correct?	a) I and III	d) II and III
a) I, II and III b) I and II	c) I and III	d) II and III
243. Arhenotoky is a type of:	1	
a) Parthenogenesis found in honey bees, wasps and	ants	
b) Parthenogenesis found in every insect		
c) Parthenogenesis found in mosquitoes		
d) Parthenogenesis found in butterflies		
244. Zebu cattle is:	) C	1) (1
a) Water Buffalo b) Indian Buffalo	c) Cow	d) Sheep
245. Mule is produced from a cross betweenA and		1 1 1
a) A-female horse; B-male donkey	b) A-male horse; B-fema	•
c) A-male horse; B-female horse	d) A-male donkey; B-fen	nale donkey
246. <i>Triticum aestivum</i> , the common breed of wheat is		
a) Triploid with 21 chromosomes	b) Tetraploid with 28 ch	
c) Hexaploid with 42 chromosomes	d) Diploid with 14 chror	nosomes
247. In male and female animals of two different rela	•	
a) Random breeding	b) Artificial insemination	
c) Controlled breeding	d) Interspecific hybridis	ation
248. Central Silk Research and Training Institute (CSRTI	() is located at:	
a) Assam	b) Bahrampur	
c) Tarai region	d) Shanthivials (Mysore	)
249. Water Buffalo is:		
a) European breed of buffalo that prefers living in v	water for most of the day	
b) Buffalo like animal living in rivers		
c) Llama		
d) Buffalo		

250. In lac insect, lac is produced from:							
a) Abdominal glands	b) Salivary glands						
c) Skin glands of abdomen	d) None of the above						
251. Mode of nutrition of explant before organogenesis is							
a) Photosynthetic b) Autotrophic	c c) Heteromorphic	d) Heterotrophic					
252. Most commercial silkworm strain is:							
a) Uni-voltine b) Vi-voltine	c) Multi-voltine	d) All of these					
253. Which among the following is the real pro	oduct of honey bee?						
a) Pollen b) Bee wax	c) Honey	d) Propolis					
254. One of the alternate sources of protein for	r animal and human nutrition is						
a) Single cell protein b) Proteomix	c) Double cell protein	d) All of these					
255. The fibre crop occupying the largest area	in India is as under:						
a) Jute b) Flax	c) Cotton	d) Simbal					
256. On the basis of unity, Nagapuri buffaloes	are categorised as:						
a) Grazers b) Dual purpos	se c) Draught cattle	d) Milkers					
257. The fruits of the plants which yield oil and	d fibres:						
a) Phoenix sylvestris b) Areca cated	chu c) Metroxylon safus	d) Cocos nucifera					
258. In mutation breeding, mutation are induc	ced by using radiation like						
a) Gamma b) X-rays	c) UV-rays	d) All of these					
259. The genetic ability of a plant to prevent p	athogen from causing disease is call	led					
a) Resistance b) Prevention	c) Pathology	d) None of these					
260. The Indian carp is:							
a) Scoliodon b) Labeo	c) Torpedo	d) Pristis					
261. Poultry includes:	G.Y						
a) Fowl, duck, tortoise and turkey	b) Fowl, duck, pigeon a	nd tortoise					
c) Duck, fowl, tortoise and turtle	d) Fowl, duck, turkey a	nd pigeon					
262. Phytotron is	5						
a) A controlled condition chamber	b) A leaf culture proces	SS					
c) A special culture of plants	d) A root culture proce	SS					
263. MOET stands for	/						
a) Multiple Ovulation Embryo Transfer te	echnology						
b) More Ovulation Embryo Transfer tech	nology						
c) Multiple Ovulation Embryo Test techno	ology						
d) None of the above							
264. Nosemia sp. a protozoan produces diseas	ses in:						
a) Silk moth	b) Honey bee						
c) Both silk moth and honey bee	d) Lac insect						
265. Colchicine brings about:							
a) Gene mutations	b) Chromosome aberra	ntions					
c) Quick replication	d) Duplication of chron	nosomes					
266. Central Sugarcane Breeding Research Ins	stitute is situated at:						
a) Coimbatore b) Lucknow	c) Delhi	d) Bhopal					
267. Silk glands of silkworm are modified:							
a) Crop glands b) Salivary gla	nds c) Gastric glands	d) Intestinal glands					
268. Consider the following statements							
I. The honey bees are pollinators of many	$\gamma$ crop species such as sunflower, $Br$	assica, apple and pear					
II. Keeping beehives in crop fields during	flowering period increases both cro	op yield and honey yield					
III. A successful bee keeping requires man	nagement of beehives during differe	ent seasons					
Which of the statements given above are	correct?						
a) I, II and III b) I and II	c) II and III	d) I and III					
269. Which of the following diseases in poultry	y is caused by nutritional deficiency	?					

	a) Perosis	b) Fowl pox	c) Coryza	d) Aspergillosus
270.	Hereditary variations can	= =	-3 A	D C'LL
271	a) X-rays	b) DDT	c) Auxin	d) Gibberellin
2/1.	Eri silk is produced by: a) <i>Bombyx mori</i>	b) Attacus ricini	c) Anthenea roylei	d) Anthenea paphia
272	Consider the following sta		c) Antineneu roytet	и) Аниненей рарни
2/2.	_	artificial insemination by h	eating	
	=	ies reared in India is <i>Apis</i> i	•	
	III. Example of interspecif	<del>-</del>	inuicu	
	-	given above is/are not corr	ect?	
	a) Only I	b) Only II	c) I and II	d) II and III
273.	•	ultural crops crops is threat	•	uj ii uiiu iii
	a) Extensive intercroppin	= =	b) Intensive use of fertiliz	ers
	c) Introduction of high yie	=	d) Intensive use of biopes	
274.		_	uality meat giving bulls hav	e been breed successfully
	to obtain a better breed in			
	a) MOET		b) Artificial insemination	
	c) Cross-bree ding		d) Induced mutation	
275.	The botanical name of pop	ocorn is:		
	a) Zea mays var. everta		b) Zea mays var. tunicata	
	c) Zea mays var. indentat	ta	d) Zea mays var. amylace	ea
276.	Most common honey bee	species in India		
	a) <i>Apis indica</i>	b) <i>Apis florea</i>	c) <i>Apis mellifera</i>	d) <i>Apis dorsata</i>
277.	Pathogen free plants are o			
	a) Callus culture	b) Embryoid culture	c) Shoot apex culture	d) Root apex culture
278.		n different breeds, it is call		
0=0	a) Inbreeding	b) Outbreeding	c) Outcrossing	d) Cross breeding
279.	The new sugar cane varies	ties had the qualities like		
	I. high yield			
	II. thick stem			
	<ul><li>III. high sugar content</li><li>IV. ability to grow in Nortl</li></ul>	n India		
	Choose the correct option			
	a) I, II and III	b) II, III and IV	c) I, II and IV	d) I, II, III and IV
280	Single cell proteins provid	•	cj i, ii alia iv	aj i, ii, iii ana iv
200.	I. protein			
	II. minerals			
	III. fats			
	IV. carbohydrates and vita	amins		
	Choose the correct option			
	a) I and III	b) II, III and IV	c) I, III and IV	d) I, II, III and IV
281.	Breeding crops for improv	ved nutritional quality is re	eferred to as	
	a) Biomagnification	b) Biome	c) Biofortification	d) Biomining
282.	Maize grain is deficient in	:		
	a) Tryptophan and lysine		b) Niacin and thiamine	
	c) Lysine and thiamine		d) Tryptophan and thiami	ine
283.	Crop plants grows in mon	oculture are:		
	a) Low in yield		b) Characterised by poor	root system
	c) Free from intraspecific	competition	d) Highly prone to pests	
284.	Cassava is a:			15 = 1
	a) Stem vegetable	b) Root vegetable	c) Leaf vegetable	d) Flower vegetable

285. Earliest anima	al to be domesticated was:		
a) Goat	b) Dog	c) Horse	d) Cat
286. Rinderpest is t	the disease of:		
a) Cattle	b) Poultry	c) Fish	d) Camel
287. Composite fish	h farming is called:		
a) Polyculture	e b) Pisciculture	c) Monoculture	d) None of these
288. Embryo cultur	re is employed in:		
a) Clonal prop	pagation	b) Induction of somac	lonal variations
c) Overcoming	g hybridisation barriers	d) Developing virus fr	ee plants
289. The yellow col	olour of cow milk is due to the p	oresence of	
a) Carotene	b) Albumin	c) Casein	d) Lactose
290. Main composit	ition of lac is:		
a) Glue, pigme	ent and sugar	b) Wax, pigment and s	glue
c) Resin, pigm	nent, wax and glue	d) Resin, sugar and w	ax
291. Quite often pu	ulse-crops are not manured wit	h nitrogenous fertilizers. It is s	o because:
a) These do no	ot require nitrogen	b) These do not need	nitrates or nitrites
c) These have	e nodulated roots	d) These do not have	nodulated roots
292. Fisheries inclu	udes rearing, catching, sellings,	of	
a) Fishes	b) Molluscs	c) Crustaceans	d) All of these
293. The wax gland	d in honey bee is found in		
a) Worker and	d queen b) Queen	c) Drons	d) Worker
294. Inbreeding is			
a) Crossing be	etween two unrelated species	b) Crossing between t	wo closely related individuals
		within the same br	eed
c) Crossing be	etween different breeds	d) None of the above	
295. When the bree	eders wants to incorporate des	sired characters into the crop p	lants, they should
	eld and improve	~ '	
II. increased to	colerance to salinity		
III. resistance	to pathogen viruses, fungi and	bacteria	
IV. increased t	tolerance to insect pests		
Choose the co	orrect option		
a) I and II	b) I, II and III	c) II, III and IV	d) All of these
296. Main protein t	type found in egg white is:	-	-
a) Ovalbumin		c) Phosvitin	d) Lipovitellin
297. The process of	of fusion of protoplast of somati	c cells obtained from different	
a suitable nutr	rient medium <i>in vitro</i> to devel	op a somatic hybrid is called	
a) Somatic hyl	bridization	b) Cross hybridization	1
c) Intravarieta	al hybridization	d) Interspecific hybrid	dization
298. Pisciculture is	s rearing and production of		
a) Fishes	b) Birds	c) Reptiles	d) Cattles
299. Which factors	s are responsible for developme		-
I. Susceptible j	plant	-	
II. Aggressive			
	ount of fertilizer		
IV. Conductive	e environment		
Choose the co	orrect option		
a) I, II and III	b) I, II and IV	c) II, III and IV	d) I, III and IV
=	following is not a marine fish?	• •	-
a) Hilsa	b) Catla	c) Pomfret	d) Mackerel
•	it parameters of poultry farm m	•	<del>-</del>
<del>-</del>	disease free, suitable breeds	-	

	II. proper and safe conditi			
	III. proper food and water	•		
	IV. temperature of poultry	y shed should be high for e	gg laying	
	Which of the statement gi	ven above is true and whic	ch is false?	
	I II III IV			
	a) T T T F	b) F T T T	c) T T F T	d) T F T F
302	. SCP production is based o	n industrial effluents so it	helps to minimize	
	a) Environmental pollution	on	b) Production of diseased	l crop
	c) Nutrient medium for ti	ssue culture	d) All of the above	
303	. SCP reduces the pressure	on agricultural production	systems for the supply of	the required
	a) Vitamins	b) Carbohydrate	c) Minerals	d) Proteins
304	. The most used domestica	ted animal by Eskimos is:		
	a) Cow	b) Sheep	c) Goat	d) Husky
305	. Which of the following me	ethods is/are used in recov	ery of healthy plants from	diseased plants?
	a) Embryo culture	b) Meristem culture	c) Suspension culture	d) Anther culture
306	. Poultry includes			
	a) Chicken	b) Duck	c) Turkey	d) All of these
307	. Scientists are trying to get		mato and potato. The most	accurate name of the
	recusant would be	v		
	a) Topato	b) Topemo	c) Potamo	d) Pomato
308	. Micropropagation is	<i>y</i> 1		,
	a) Propagation of microbe	es <i>in vitro</i>	b) Propagation of plants	in vitro
	c) Propagation of cells <i>in</i>		d) Growing plants on sma	
309	. A collection of plants and			
	a) Herbarium	b) Germplasm	c) Gene library	d) Genome
310	. Hybrid breed of cattle is:	o) derinpident		a) denome
010	a) Sunandini	b) Holstein	c) Brown Swiss	d) Kankrej
311	. Select the false statement	•	ej Brown owico	a) nami oj
011		nd bajra have been success	fully developed in India	
			India, but had poor sugar	content and vield
			idia's GDP and employs nea	<del>-</del>
	d) None of the above	or approximately 55 % of in	iaia 5 abi ana employ5 net	arry 62 70 or the population
312	. The term 'totipotency' ref	ers to the canacity of a		
312	a) Bud to generate whole		b) Cell to generate whole	nlant
	c) Seed to germinate who		d) Cell to enlarge in size	piant
212	. Which of the following is	•	,	
313	a) Himgiri	b) Pusa Komal	c) Pusa Sadabahar	d) Pusa Shubra
21 <i>/</i> .	. Removal of anther of som			uj i usa silubi a
JIT	a) Emasculation	e nowers during plant bret	b) Anthesis	
	c) Pollination		d) For collection of poller	1
215	. The animal close to huma	n hainga which is alanad b		
313	a) Gorilla	b) Chimpanzee	c) Gibbon	d) Monkey
216	. Majority of people suffer f		•	•
310		<del>-</del>	inici onuti ient denciencies	s. Then food does not
	contain essential micronu	iti lents specially		
	I. iron			
	II. iodine			
	III. zinc			
	IV. vitamin-A	at 7		
	Which of the above are co		.) II III 1 III	.1) I II III   1 777
245	a) I, II and III	b) I, III and IV	c) II, III and IV	d) I, II, III and IV
31/	. In plant biotechnology, PI	LG IS USEA IN		

a) Protoplast isolation	b) Cell culture preparation	n
c) Protoplast fusion	d) Hardening	
318. Aim of plant breeding is to:		
a) Control pollution	b) Keep soil fertile	
c) Produce improved varieties	d) To maintain wild plant	S
319. Choose the scientific name of a microorganism which	h produces high quality of p	orotein
a) <i>Spirulina</i> b) <i>Chara</i>	c) Agar-agar	d) <i>Ephedra</i>
320. Disease resistant crop is obtained by	, 0 0	<i>y</i> 1
a) Crossing with new varieties	b) Crossing with wild vari	ieties
c) Injecting with organic compounds	d) None of the above	
321. More than 70% of livestock population is found in	a) None of the above	
a) Denmark b) India	c) China	d) Both (b) and (c)
322. Which of the following is the pair of biofertilizers?	c) dililia	a) both (b) and (c)
a) Azolla and BGA	b) Nostoc and legume	
c) Rhizobium and grasses	d) Salmonella and E.coli	4
	uj Saiiliollella allu E.coli	
323. Haploid plantlets can be produced by	a) Emphassa aultuma	d) Manistana gultura
a) Pollen culture b) Cotyledon culture	c) Embryo culture	d) Meristem culture
324. An exotic breed of cow is:	O II IIII	D.D !
a) Ongole b) Friesian	c) Halliker	d) Deoni
325. Surrogate mother is:		
a) Mother without lactation		
b) Future mother with embryo implanted from anoth	her	
c) Carrying several embryos at one time		
d) Artificially inseminated female		
326. Bactrian camel is characterised by:		
a) Two humps and long neck	b) Two humps and long li	
c) Two humps and thick coat	d) Single hump and thick	coat
327. Inland fisheries is referred to:		
a) Culturing fish in freshwater	b) Trapping and capturing	=
c) Deep sea fishing	d) Extraction of oil from f	ishes
328. Rearing of honey bees is practiced for obtaining		
a) Honey b) Wax	c) Honey and wax	d) None of these
329. Sugars extracted from sugarcane and sugar beet diffe	er in:	
a) Taste		
b) Colour		
c) C <sup>13</sup> /C <sup>12</sup> ratio		
d) The one extracted from sugarcane is sucrose is wh	hile from sugarbeet is fruct	ose
330. Some common marine fishes are		
a) Hilsa b) Mackerel	c) Pomfrets	d) All of these
331. Breeding of crops with higher levels of vitamins and	minerals or higher protein	and healthier fats is called
a) Plant breeding b) Biofortification	c) Both (a) and (b)	d) Crop protection
332. Castor oil is obtained from:		
a) Brassica compestris	b) Ricinus communis	
c) Helianthus annus	d) Arachis hypogea	
333. Cellular totipotency is demonstrated by		
a) All eukaryotic cells	b) Only bacterial cells	
c) Only gymnosperm cells	d) All plant cells	
334. In honey, the percentage of maltose and other sugars		
a) 9.2 b) 8.81	c) 10.5	d) 11.2
335. Which of the following is a correct match between cr	op, variety and resistance	•

	Crops	Variety	Resi	stance to diseases		
	a) Wheat	Himgiri		White rust		
	b) Brassica	Pusa sadab	ahat	Black rot		
	c) Cowpea	Pusa koma	l	Bacterial blight		
	d) Chilli	Pusa swarn	iim	Chilly mosic virus		
336.	Which one is	correct about	Atlas	66?		
	a) It has high	protein conte	ent		b) It has been used as a c	lonor for improving
	, 0	1			cultivated wheat	1 5
	c) both (a) ar	nd (b)			d) None of the above	
337.			mollu	sca groups is prima	rily used in the pearl form	nation?
	a) Monoplace	_		halopods	c) Gastropods	d) Pelecypods
338.		-	-	itroduced in India	c) dustropous	ay release peace
	a) 1966		b) 196		c) 1967	d) 1969
339	-		-	prepared ponds	0) 1707	u, 1303
00).	a) Aquacultu		-	ciculture	c) Vermiculture	d) Agriculture
340			-	uence of cultivation	•	a) rigireareare
5 10.		rlings–spawn	_		b) Spawn–fry–fingerlin	gs—adult
		awn–fingerlin			d) Fingerlings—fry—spav	
241		tion of cotton			d) I nigerinigs if y spav	wii addit
JT1.	a) Cellulose		b) Call		c) Chitin	d) Pectin
2/12	Triticum aes		D) Can	1036	c) Gillan	u) i ecuii
342.	a) Diploid		b) Trij	nloid	c) Haploid	d) Hexaploid
2/2		t of poultry is:	ַנו נט	pioid	c) Hapioiu	u) Hexapioiu
343.	a) Eggs	= =	b) Chi	ckon	c) Meat	d) Eggs and meat
211		e sought after	-	CKCII	c) Meat	u) Eggs and meat
344.	a) Skin	_	b) Hai	r	c) Meat	d) Ivory
215	•		-		of our country comes from	-
343.	a) Cows			faloes	c) Camels	
246	,		•			d) Goat
340.		ent of farm an			imals husbandry include	
	, ,		u tai iii	animais	b) Animals breeding	
247	c) Both (a) a				d) None of the above	
347.	Exotic breeds	s: pecific environ	mont		h) Handy and high wieldi	m.a
			ment		b) Hardy and high yielding	ng
240	c) Are sturdy				d) Take less food	
340.	Hatching net		h) Duo	duation nand	a) Chaolsing mand	d) Hana
240	a) Nursery ki		-	duction pond	c) Stocking pond	d) Hapa
349.		_		digree bull only	creasing productivity of su	iper milk cows:
				uction cow only		
		ansplantation	_	on artificial incomi	nation and ambuva transp	lantation into a garrian gave
7		=	voiau	on, al unciai msemi	nation and embryo transp	plantation into a carrier cow
250	(surrogate	•		2.2 among of vice an	mually. The agreements for	turns that maless this
350.		i iliulali states	raise	2-5 crops of rice an	nually. The agronomic fea	ture that makes this
	possible is					
	a) Shorter ric	=	_			
	=	gation facilitie				
		ling rice varie	-			
254	-	sistant rice va	-			
<b>351</b> .				me variety are:	a) Internal 1111	d) Introduction
252	a) Intravarie		-	erspecific	c) Intervarietal	d) Intrageneric
<i>3</i> 52.	Animai breed	ling is produci	ing im	provea breeds of!	$\mathbf{A}$ by improving their $$ B	3 through selective mating.

	Here A and B refers to		
	a) A-domesticated animals, B-phenotype		
	b) A-wild animals, B-genotype		
	c) A-domesticated animals, B-genotype		
	d) A-wild animals, B-phenotype		
353.	250 g of <i>Methylophilus methylotrophus</i> bacterium	has been used to produce	
	a) 15 tonnes of proteins	b) 25 tonnes of proteins	
	c) 35 tonnes of proteins	d) 50 tonnes of proteins	
354.	Aquaculture includes:	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
	a) Freshwater fishing b) Brackish water fishes	c) Marine fishery	d) All of the above
355	The amount of protein per 100 g (without water, app	•	.,
	a) 11.9 b) 20.1	c) 16	d) 45
356	Parthenogenesis is commonly found in:	0) 10	u) 10
000.	a) Ants, bees and wasps	b) Ascaris, earthworm an	d liver fluke
	c) Frogs, fishes and foxes	d) Star fish, Jelly fish and	
257	Green revolution depended mainly on plant breeding		
337.	varieties of	g techniques for high yieldi	ing and disease resistant
		a) Maiga	d) All of these
250	a) Wheat b) Rice	c) Maize	a) All of these
338.	Crustacean fishery is connected with exploitation of	a) Challandanttle Cab	d) I alastan and
250	a) Oysters and crabs b) Mussels and squids	c) Shell and cuttle fish	d) Lobster and prawn
359.	The art and science of combining ideas, facilities, pro	cess, materials and labour	to produce and market a
	worth, while produce or service successfully called		D.M. Col
0.60	a) Marketing b) Improvements	c) Management	d) None of these
360.	The domesticated birds used for food or for their egg		
	a) Poultry b) Egg farming	c) Apiculture	d) Dairy farming
361.	In poultry birds, nasal and eye discharge with foul sr	nell, acute respiratory prob	olem and inflammed and
	swollen eyes are the symptoms of		
	a) Chronic respiratory disease	b) Infectious coryza disea	se
	c) Brooder pneumonia disease	d) Marck's disease	
362.	Which type of silk is obtained from <i>Bombyx mori?</i>		
	a) Reeled silk b) Muga silk	c) Arandi silk	d) Tasar silk
363.	A hybrid variety produced, having more meat produ		S:
	a) Broilers b) Plymoth rock	c) White Cornish	d) New Hemisphere
364.	Somaclonal variations are obtained through:		
	a) Chemical mutagens b) Gamma rays	c) Tissue culture	d) Amphimixis
365.	The principle source of sugar is/are:		
	a) Sugarcane b) Sugar beet	c) Palm	d) Both (A) and (B)
366.	A andB cover more than 70% of the world's $\boldsymbol{l}$	ivestock population but co	ntribute only 25% to the
	world farm production. Here A and B refers		
	a) A-India; B-China b) A-US; B-China	c) A-India; B-US	d) A-US; B-Brazil
367.	Which of the following terms is used to describe the	component isolated from a	plant, for <i>in vitro</i>
	culturing in the specific medium?		
	a) Callus b) Embryoid	c) Synthetic seeds	d) Explant
368.	The draught breeds of cattle include:		
	a) Malvi, Nageri and Hallikar	b) Malvi, Nageri and Ongo	ole
	c) Nageri, Ongole and Haryana	d) All the above	
369.	Cryopreservation is:		
	a) Preservation of living being in chemicals	b) Preservation of very lo	w temperature
	c) Preservation through exposure to irradiation	d) Preservation at high te	——————————————————————————————————————
370.	The name of the sheep which was cloned for the first		•
	a) Dolly b) Polly	c) Molly	d) Holly
	-	-	-

371.	A disease of poultry which	n reduces immunity and sp	reads through contaminate	ed food is
	a) Ranikhet disease	b) Aflatoxicosis	c) Thrush	d) Marck's disease
372.	For production of haploid	s, we culture		
	a) Shoot tip	b) Anther	c) Root tip	d) None of these
373.	Selection is a method of:			
	a) Cytology	b) Plant physiology	c) Plant breeding	d) Genetics
374.	Examples of high-yielding	and disease resistant whe	at varieties were introduce	ed in India in
	a) 1961	b) 1962	c) 1963	d) 1964
375.	Lac is produced from:			
	a) Only males		b) Only females	
	c) More females than mal	es	d) More males than femal	es
376.	Choose the flowers of whi	ch plant are not pollinated	by honey bee	
	a) Sunflower	b) Apple and pear	c) <i>Brassica</i>	d) All of these
377.	Somaclones are obtained	by		
	a) Tissue culture	b) Plant breeding	c) Irradiation	d) Genetic engineering
378.	The largest wheat produc	ing country is:		V
	a) India		b) United States of Americ	ca
	c) Mexico		d) Japan	
379.	Microbes like Spirulina, M	Methylophilus methylotro	opus can be grown on indus	strial scale as sources of
	good			
	a) Fat	b) Carbohydrate	c) Protein	d) All of these
380.	The world's highly prized	wool yielding 'Pashmina b	oreed' is:	
	a) Sheep		b) Goat	
	c) Goat-sheep cross	4	d) Kashmir sheep-Afghan	sheep cross
381.	Shakti, Rattan and Protina	a are three important lysin	e rich varieties of	
	a) Rice	b) Pulses	c) Wheat	d) Maize
382.	An explant is			
	a) Dead plant			
	b) Part of the plant			
	c) Part of the plant used in	n tissue culture		
	d) Part of the plant that ex	xpresses a specific gene		
383.	High content of lysine is p	resent in		
	a) Wheat	b) Apple	c) Maize	d) Banana
384.	The process of breeding b	y artificially inducing muta	ations using chemical or rac	diation is called
	a) Artificial breeding	b) Chemical breeding	c) Synthetic breeding	d) Mutation breeding
385.	Infertility of local breeds	of cattle can be overcome b	y use of:	
	a) Cross breeding with ex	otic breeds	b) Good nourishment	
	c) Stilbesterol		d) Gonadotropin	
386.	What will you conclude, w	when a cow is crossed to a b	oull and female progeny is y	vielding more milk than its
	mother?			_
	a) More number of genes	for high yielding milk are i	nherited, only from the fem	nale parent
	b) More number of genes	for high yielding milk are i	nherited only, from the ma	le parent
	c) More number of genes	for high yielding milk are i	nherited only from both the	e parent
	=	= -	mber of genes for high yield	<del>-</del>
387.	Semi-dwarf wheat was de			
		r Wheat and Maize Improv	vement Brazil	
	=	r Wheat and Maize Improv		
	=	r Wheat and Rice Improve		
	=	r Wheat and Gram Improv	· =	
388.	Pisciculture has bright fut	_		
	a) Considerable demand		b) Good response of nativ	e fishes to culture

d) All of these	
hindi was transferred from a wild spec	cies and resulted in new
c) IR-8	d) Parbhani
and selection for disease resistance aga	ainst rust pathogens is a
<u> </u>	1 0
c) Sugarcane	d) Wheat
.,	, , , , , , , , , , , , , , , , , , , ,
ndica c) Pinctada vulgaris	d) Ostrea vulgaris
,	a, con car angan ic
	d) Salmonellosis
,	
_	
acii ciiibi yo is transpianteu iito ad.	It to a m the above
D-hormone F-more F-one C-mother	
	liother
ilical, E-more, F-one, G-mother	
h) Claning in shoon	
	ians
	DARATA Darata
n; B-rats c) A-rats; B-protein	d) A-lipid; B-protein
1	
e banana c) Banana pudding	d) None of the above
monodon c) Macrobrachium	d) Palaemon
A , Y	
-	
	out of body
•	
<i>us</i> can produce 20 tonnes of protein pe	er day
lar and multicellular organisms	
can origin, while rice originated in:	
c) America	d) Africa
c) Both (a) and (b)	d) None of these
of ficinarum are varieties of	
c) Wheat	d) Rice
s with desirable characters of high yiel	d
IV c) II, III and IV	d) I, II, III and IV
rom:	-
otato c) Beet	d) Colocasia
	c) IR-8 Ind selection for disease resistance again c) Sugarcane  Indica c) Pinctada vulgaris Isease of the poultry? Isle disease c) Pasteurellosis IOET generallyA ovum is released can be produced from the ovary. After ach embryo is transplanted into aG.  D-hormone, E-more, F-one, G-mother incone, E-more, F-4 to 10, G-surrogate in image. E-more, F-4 to 10, G-mother incal, E-more, F-one, G-mother incal, E-more, F-one, G-mother incolour in humboor inB Here A and B refers to in; B-fats c) A-fats; B-protein in incolour inco

405. The drug which reduces	s blood pressure is obtaine	u 11 0111:	
a) Solanum nigrum		b) Aconitum	
c) Centella asiatica		d) Rauwolfia serpentin	a
406. Huskies are:			
a) Yaks	b) Donkeys	c) Thick coated dogs	d) Water buffaloes
407. In mung bean, resistanc	e to yellow mosaic virus aı	nd powdery mildew were int	troduced by
a) Hybrid vigour	b) Plant breeding	c) Hetrosis	d) Mutation
408. Shagreen is obtained from	om:		
a) Dried skin of shark	b) Skin of codfish	c) Air bladder of fishes	d) None of the above
409. Which of the following i	s correctly matched?	-	$\sim$
a) Apiculture – Honey b	ee	b) Pisciculture – Silk mot	ch ch
c) Sericulture – Fish		d) Aquaculture – Mosqui	tose
410. Milk yield is primarily d	ependent on the		
a) Quality of breeds	b) Quality of milk	c) Both (a) and (b)	d) None of these
411. Before the European inv			
a) Potato and Tomato	S	b) Simla mirch and Brinj	al
c) Maize and chichinda		d) Bitter gourd	
412. Which one of the follow	ing types of silk is being pr	, ,	India?
a) Eri	b) Mulberry	c) Tussar	d) Muga
413. Which is the most impor	•		, 0
a) Algae	b) Fungi	c) Cereals	d) Gymnosperms
414. The scientific name of B	, ,	,	., .,
a) Sorghum vulgare		b) Corchorus capsularis	S
c) Gossypium herbacei	ım	d) Pennisetum typhoide	
415. Macaroni is obtained fro		ag I consideration of process	
a) Oryza sativa	,,,,,	b) Sorghum vulgare	
c) Triticum durum		d) Ricinus communis	
416. The management of anim	mals for milk and its produ	•	is called
a) Dairying	mais for mink and its produ	b) Poultry	15 canea
c) Cattle farming		d) Livestock improvemen	nt
417. To isolate protoplast, or	ne needs	a) Livestock improvemen	110
a) Pectinase	b) Cellulase	c) Both (a) and (b)	d) Chitinase
418. The green alga rich in pr			
a) Chlamydomonas	b) <i>Volvox</i>	c) Spirogyra	d) Spirulina
419. Consider the following s	•		
	nts can be grown in short t	<del>-</del>	culture/inicropropagation
	n be developed from disea		
III. seedless plants can b	<del>-</del>	iscu piants	
•	•	, where sexual hybridization	not nossible
Choose the correct option	•	, where sexual hybridization	Hot possible
a) I, II and III	b) II, III and IV	c) I, II and IV	d) I II III and IV
			d) I, II, III and IV
420. Which of the following of		= -	
a) India	b) Pakistan	c) Netherlands	d) England
421. Which of the following p	<del>-</del>		J) I alastan and manana
a) Oysters and crabs	b) Mussels and squids	c) Shells and culttle fish	d) Lobster and prawn
422. Consider the following s			
	breeding may be used for o	<del>-</del>	h - C Cl
		be used immediately or can	
<del>-</del>	<del>-</del>	out using artificial insemina	ation and multiple ovulation
embryo transfer techno	<del></del>		
Which of the statements	given above are correct?		

- a) I and II
- b) I and III
- c) II and III
- d) I, II and III

- 423. Pulses belong to the family:
  - a) Leguminosae
- b) Gramineae
- c) Cruciferae
- d) Compositae

- 424. The green revolution in India was possible due to:
  - a) Exploitation of high yielding varieties
  - b) Intensive cultivation
  - c) Better irrigation, fertilizer, pesticides etc. facilities
  - d) All the above
- 425. The fishery does not include the rearing, catching and processing of
  - a) Crabs and corals

b) Squids and lobsters

c) Aquatic plants and animals

d) All of the above

426. Bird flu is caused by

- a) Fungus
- b) Bacteria
- c) Protozoa
- d) Virus
- 427. The host crop plants may be resistant to insects pests due to the
  - I. morphological characteristics
  - II. biochemical characteristics
  - III. physiological characteristics

Choose the correct option

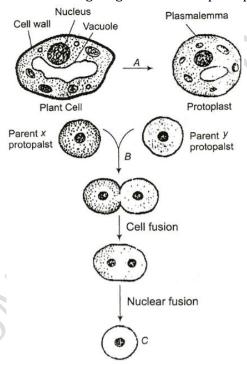
- a) I and II
- b) II and III
- c) I and III
- d) I, II and III
- 428. Rice, maize, sorghum and millets are the principal cereals of the:
  - a) Temperate region
- b) Tropics
- c) North pole
- d) Cold regions
- 429. When breeding is between the unrelated animals, including individuals of the same breed but having no common ancestors for 4-6 generations or between different breeds or different species, it is called
  - a) Outbreeding

b) Inbreeding

c) inbreeding depression

d) Hybridization

430. The following diagram refers to protoplast fusion



Here A, B and C refers to

- a) A-Cellulase and bactinase, B-Polyethylene glycol, C-Somatic hybrid cell
- b) A-Pectinase, B-Cellulase, C-Zygotic cell
- c) A-Proteinase, B-Polyethylene glycol, C-Somatic hybrid cell
- d) A-Cellulase, pectinase, B-Proteinase, C-Germ cell
- 431. Which of the following crop plants is not matching as correct pair with its variety

	I. Chili – Pusa Sadabahar			
	II. Flat bean – Pusa stem-2			
	III. Rape seed – Pusa Gaura	av		
	IV. Cauliflower – Pusa Shu	bhra		
	V. Cow pea – Pusa Komal			
	VI. Wheat – Pusa A-4			
	Choose the correct option			
	a) V	b) VI	c) IV	d) I
432.	Part of the plant, which is	cultured to obtain virus fre	ee clones is	
	a) Leaf	b) Root tip	c) Short tip	d) Embryo
433.	Which one of the following	g is a viral disease of poultr	·y?	
	a) Bird flu	b) Swine flu	c) Fowl cholera	d) Spirochaetosis
434.	Given below are a few stat	ements regarding somatic	hybridisation	
	I. Protoplasts of different of	cells of the same plant can l	be fused	
	II. Protoplasts from cells o	f different species can be for	used	
	III. Treatment of cells with	cellulose and pectinase is	mandatory	
	IV. The hybrid protoplast of	contains characters of only	one parental protoplast	
	Choose the correct option			
	a) I and II	b) I and I	c) II and III	d) III and IV
435.	Semi-dwarf wheat was de	veloped by		
	a) Norman E Borlaug	b) MS Swaminathan	c) WY Cheung	d) Fontana
436.	Single cell protein reduces	3		
	a) Environment pollution		b) Greenhouse effect	
	c) Global warming		d) Production and growth	of crop
437.	The process which results	in the identification of sup	erior males and superior f	emales of the same breed
	a) Inbreeding	b) Outbreeding	c) Outcrossing	d) None of these
438.	The species which yield co	ommercial cotton belongs t	o the genus:	
	a) Hibiscus	b) Abutilon	c) Sida	d) Gossypium
439.	A andB were cross	ed to obtained sugarcane v	varieties having desirable q	ualities and ability to grant
	in the sugarcane areas of N	North India. The most appr	opriate option for A and B	is
	a) A-Saccharum procerum	r; B- <i>Saccharum robustum</i>		
	b) A-Saccharum barberi; E			
	c) A-Saccharum spontanu			
	d) A- <i>Saccharum barberi;</i> E			
440.	Some common fresh water			
	a) Catla	b) Rohu	c) Common carp	d) All of these
441.	Taichung native-the dwar	<u>-</u>		
	a) Japan	b) Philippines	c) Taiwan	d) Mexico
442.	Silk, honey and lac are:			
	a) Secretory substances of	finsects	b) Secretory substances o	f plants
	c) Artificial chemicals		d) All of the above	
443.	Which of the following is i	=		
	a) Pusa Gaurav	b) Pusa Sem-2	c) Pusa Sem-3	d) All the above
444.	Molluscs are also called as			
	a) Ray fish	b) Golden fish	c) Electric fish	d) Shell fish
445.	To meet the demands of the	=	=	antlets in a short duration
	=	and horticulture industry	=	
	a) Somatic hybridization		b) Micropropagation	
111	c) Hybridoma technology	Alan da	d) Somaclonal variation	
446.	Rearing of honey bees for			J) A 14
	a) Pisciculture	b) Sericulture	c) Apiculture	d) Aquaculture

447.	The word poultry is used f	for		
	a) Wild birds	b) Domestic bird	c) Both (a) and (b)	d) All of these
448.	Who gave the idea that eve	ery plant cell is totipotent?		
	a) PR White	b) EC Cocking	c) FC Steward	d) G Haberlandt
449.	Lac is a:			
	a) Plant product	b) Mineral product	c) Synthetic product	d) Animal product
450.	Edible aquatic animals are			
	a) Crab	b) Lobster	c) Oyster	d) All of these
451.	Which of the following is r	not a root vegetable?		
	a) Solanum tuberosum		b) Ipomoea batatas	
	c) Beta vulgaris		d) Raphanus sativus	
452.	Ranikhet or New Castle Di	sease of poultry is caused l	by:	
	a) Bacteria	b) Virus	c) Fungus	d) None of these
453.	In dairy management, the	people deals with processe	es and systems that	
	a) Increase yield of milk		b) Improve quality of milk	
	c) Both (a) and (b)		d) Marketing of milk	
454.	Ship of desert is:		. ( 4	
	a) Elephant	b) Camel	c) Sheep	d) Goat
455.	Exotic breeds are:			
	a) Used for cross breeding	5	b) Allowed to multiply and	d replace local breeds
	c) Easy to manage		d) Resistant to local pests	and pathogens
456.	When breeding is between	n animals of the same breed	d for 4-6 generation, it is ca	lled
	a) Crossbreeding	b) Outbreeding	c) Outcrossing	d) Inbreeding
457.	Paddy is suitable for cultiv	vation in:		
	a) Red soils	b) Dry soils	c) Irrigated soils	d) Black soils
458.	Father of white revolution	in India is	>'	
	a) Verghese Kurein	b) Dr MS Swaminathan	c) Alexzander Flemming	d) William Harvey
459.	Dharwar American variety	y of cotton is the product of	f	
	a) Mass selection		b) Mutual breeding	
	c) Clonal selection		d) Parasexual hybridization	on
460.	The scientific name of Jow	ar is:		
	a) Sorghum vulgare		b) Corchorus capsularis	
	c) Gossypium herbaceum	ı	d) Pennisetum typhoides	3
461.	The commercial jute fiber:	s are:		
	a) Xylem fibres	b) Cortical fibres	c) Phloem fibres	d) Interxylary fibres
462.	Haploid plants are preferr	ed over diploid plants for s	study of mutation because i	n haploids:
	a) Culturing is easy		b) Only dominant mutatio	n expresses
	c) Only recessive mutation	n expresses	d) All mutations express	
463.	Which of the statements is	s correct?		
	I. The maintenance of hive	es for the production of hor	ney bees for the is called ap	iculture
	II. A group of animals relat	ted by descent and similar	in most characters are calle	ed a breed
		=	vestock is called animal hu	
	Choose the correct option	=		
	a) I, II and III	b) I and II	c) I and III	d) II and III

# STRATEGIES FOR ENHANCEMENT IN FOOD PRODUCTION

**BIOLOGY** 

						: ANS	W	ER K	EY						
1)	a	2)	b	3)	d	4)		177)	d	178)	С	179)	С	180) a	a
5)	c	6)	c	7)	a	8)	c	181)	a	182)	a	183)	b		a
9)	d	10)	a	11)	c	12)	b	185)	b	186)	d	187)	a	188)	d
13)	C	14)	c	15)	d	16)	c	189)	c	190)	a	191)	d	192)	c
17)	c	18)	d	19)	c	20)	a	193)	b	194)	b	195)	d	196) a	a
21)	a	22)	d	23)	c	24)	b	197)	d	198)	a	199)	a	200)	d
25)	a	26)	d	27)	d	28)	a	201)	a	202)	b	203)	a	204)	c
29)	C	30)	c	31)	c	32)	b	205)	d	206)	c	207)	Ċ	208) a	a
33)	a	34)	d	35)	a	36)	b	209)	d	210)	a	211)	b	<b>212)</b> a	a
37)	b	38)	c	39)	a	40)	d	213)	a	214)	d	215)	c	<b>216)</b> a	a
41)	b	42)	a	43)	d	44)	c	217)	a	218)	b	219)	a	220) l	b
45)	a	46)	d	47)	d	48)	b	221)	b	222)	C	223)	c	224) l	b
49)	a	50)	b	51)	d	52)	d	225)	C	226)	a	227)	c	228) a	a
53)	b	54)	a	55)	a	56)	a	229)	b	230)	a	231)	a	232)	C
57)	a	58)	b	59)	a	60)	b	,	b	234)	C	235)	c	236)	d
61)	b	62)	a	63)	a	64)	C	237)	a	238)	C	239)	b	240) l	b
65)	C	66)	a	67)	c	68)	d	241)	a	242)	a	243)	a	244) (	C
69)	a	70)	d	71)	b	72)	C	,	a	246)	C	247)	d	•	d
73)	C	74)	C	75)	a	76)	C	249)	d	250)	C	251)	d	252) l	b
77)	d	78)	C	79)	a	80)	d	253)	d	254)	a	255)	c	256)	d
81)	a	82)	C	83)	b	84)	c	257)	d	258)	d	259)	a	•	b
85)	b	86)	c	87)	C	88)	C	,	d	262)	a	263)	a	,	C
89)	d	90)	b	91)	d	92)	a	,	d	266)	a	267)	b	-	a
93)	b	94)	C	95)	d	96)	C	269)	a	270)	a	271)	b	•	d
97)	a	98)	d	99)	b	100)	d	,	C	274)	a	275)	a	-	a
101)	b	102)	C	103)	a	104)	a	,	С	278)	b	279)	d	•	d
105)	b	106)	b	107)	C	108)	a	- ,	С	282)	a	283)	d	•	b
109)	b	110)	b	111)	C	112)	d		b	286)	a	287)	a	,	C
113)	d	114)	a	115)	b	116)		289)	a	290)	С	291)	C	•	d
117)	d	118)	b	119)	d	120)		293)	d	294)	d	295)	d	•	a
121)	a	122)	d	123)	C	124)		297)	a	298)	a	299)	b	-	b
125)	C	126)	a	127)	c	128)		301)	a	302)	a	303)	d	-	d
129)	a	130)	d	131)	b	132)		305)	b	306)	d	307)	d	-	b
133)	b	134)	c	135)	a	136)		309)	b	310)	a	311)	d	-	b
137)	d	138)	d	139)	b	140)		313)	a	314)	a	315)	d	•	d
141)	b	142)	d	143)	d	144)		317)	c	318)	С	319)	a	-	b
145)	C	146)	b	147)	a	148)		321)	d	322)	a	323)	a	-	b
149)	b	150)	b	151)	a	152)		325)	b	326)	C	327)	a	-	C
153)	c	154)	a	155)	d	156)		329)	C	330)	d	331)	b	-	b
157)	c	158)	b	159)	C	160)		333)	d	334)	b	335)	C h	-	C
161)	a	162)	a	163)	b	164)		337)	d	338)	a	339)	b	-	C
165)	a a	166)	d	167)	C	168)		341)	a	342)	d	343)	a	-	d
169)	d b	170)	c	171) 175)	d	172) 176)		345)	b a	346)	c	347) 251)	a	-	d
173)	b	174)	a	175)	С	176)	D	349)	d	350)	С	351)	a	352)	С

357) d	353)	b	354)	d	355)	b	356)	a	
365)         d         366)         a         367)         d         368)         a           369)         b         370)         c         371)         b         372)         b           373)         c         374)         c         375)         b         376)         d           3777)         a         3781         b         379)         c         380)         b           381)         d         382)         c         383)         c         384)         d           385)         d         386)         c         387)         b         3892         b           389)         d         390)         d         391)         c         392)         b           393)         b         394)         c         395)         b         396)         a           397)         b         398)         b         399)         c         400)         b           401)         c         402         a         403         d         404         b           405         d         406         c         407         d         408         a           417		d		d		c		a	
369)         b         370)         c         371)         b         372)         b           373)         c         374)         c         375)         b         376)         d           377)         a         378)         b         379)         c         380)         b           381)         d         382)         c         383)         c         384)         d           385)         d         386)         c         387)         b         388)         d           389)         d         390)         d         391)         c         392)         b           393)         b         394)         c         395)         b         396)         a           397)         b         398)         b         399)         c         400)         b           401)         c         402,         a         403,         d         404,         b           405,         d         406,         c         407,         d         408,         a           417,         c         418,         d         419,         d         420,         a           421,				a		a		c	
373) c									
377)       a       378)       b       379)       c       380)       b         381)       d       382)       c       383)       c       384)       d         385)       d       386)       c       387)       b       388)       d         389)       d       390)       d       391)       c       392)       b         397)       b       398)       b       399)       c       400)       b         401)       c       402)       a       403)       d       404)       b         405)       d       406)       c       407)       d       408)       a         409)       a       410)       a       411)       a       412)       c         413)       c       414)       d       415)       c       416)       a         417)       c       418)       d       419)       d       420)       a         421)       d       422)       d       423)       a       424)       c         429)       a       430)       a       431)       b       435)       a         437)									
381)         d         382)         c         383)         c         384)         d           385)         d         386)         c         387)         b         388)         d           389)         d         390)         d         391)         c         392)         b           393)         b         394)         c         395)         b         396)         a           397)         b         398)         b         399)         c         400)         b           401)         c         402)         a         403)         d         404)         b           405)         d         406)         c         407)         d         408)         a           409)         a         410)         a         411)         a         412)         c           413)         c         418)         d         419)         d         420)         a           421)         d         422)         d         423)         a         424)         c           429)         a         430)         a         431)         b         432)         c           433)									
385)       d       386)       c       387)       b       388)       d         389)       d       390)       d       391)       c       392)       b         393)       b       394)       c       395)       b       396)       a         397)       b       398)       b       399)       c       400)       b         401)       c       402)       a       403)       d       404)       b         405)       d       406)       c       407)       d       408)       a         409)       a       410)       a       411)       a       412)       c         413)       c       414)       d       415)       c       416)       a         417)       c       418)       d       419)       d       420)       a         421)       d       422)       d       423)       a       424)       c         429)       a       430)       a       431)       b       432)       c         433)       a       434)       c       443)       d       440)       d         441)									
389) d 390) d 391) c 392) b 393) b 394) c 395) b 396) a 397) b 398) b 399) c 400) b 401) c 402) a 403) d 404) b 405) d 406) c 407) d 408) a 409) a 410) a 411) a 412) c 413) c 414) d 415) c 416) a 421) d 422) d 423) a 424) c 425) c 426) d 427) d 428) b 429) a 430) a 431) b 432) c 433) a 434) c 435) a 436) a 437) a 438) d 439) d 440) d 441) a 442) a 443) d 444) d 445) b 446) c 447) a 448) d 449) d 450) d 450) d 451) a 455) a 456) d 460) a									
393) b 394) c 395) b 396) a 397) c 400) b 401) c 402) a 403) d 404) b 405) d 406) c 407) d 408) a 409) a 410) a 411) a 412) c 413) c 414) d 415) c 416) a 421) d 422) d 423) a 424) c 425) c 426) d 427) d 428) b 429) a 430) a 431) b 432) c 433) a 434) c 435) a 436) a 437) a 438) d 439) d 440) d 441) a 442) a 443) d 444) d 445) b 446) c 447) a 448) d 449) d 450) d 451) a 455) b 446) c 447) a 448) d 449) d 450) d 451) a 455) a 456) d 457) c 458) b 459) d 460) a									
397) b 398) b 399) c 400) b 401) c 402) a 403) d 404) b 405) d 406) c 407) d 408) a 409) a 410) a 411) a 412) c 413) c 414) d 415) c 416) a 421) d 422) d 423) a 424) c 425) c 426) d 427) d 428) b 429) a 430) a 431) b 432) c 433) a 434) c 435) a 436) a 437) a 438) d 439) d 440) d 441) a 442) a 443) d 444) d 445) b 446) c 447) a 448) d 449) d 450) d 451) a 452) b 453) c 454) b 455) d 455) a 456) d 457) c 458) b 459) d 460) a									
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## STRATEGIES FOR ENHANCEMENT IN FOOD PRODUCTION

#### **BIOLOGY**

## : HINTS AND SOLUTIONS :

1 (a)

Aquaculture is the farming of aquatic organisms such as fish, crustaceans, mollusc and aquatic plants

2 **(b)** 

Differentiation of organs and tissues in a developing organism is associated with the differential expression of the genes. In regulation of gene expression, the chromosomal proteins plays an important role. The chromosomal proteins plays an important role. The chromosomal proteins are of two types-histones and non-histones. The regulation of the gene expression involves an interaction between histones and non-histones

5 **(c**)

Mating between male and female animals of two different species is called interspecific hybridization. The Mule is the best example of a successful cross between two different species, the female horse and the male donkey

7 (a)

Bee wax is a product of industrial importance. It is used in the manufacture of cosmetics, shaving creams and polishes

8 **(c)** 

In 1963 the increase in crop production was due to introduction of semi-dwarf varieties of wheat. Semi-dwarf wheat was developed by Norman E. Borlaug at International Centre for Wheat and Maize Improvement in Mexico. Semi-dwarf varieties of rice were developed from IR-8 (developed at International Research Institute Phillipines) and Taichung Native-1 (developed in Taiwan)

10 **(a)** 

Evalution. of germplasm is carried out to identify plants with desirable combination of characters

14 **(c)** 

*S. barberi* was grown in North India, had poor sugar content and yield

*S. officinarum* did not grown in North India, had thicker stem and higher sugar content

15 **(d)** 

Three billion people suffer form protein, vitamins, and micronutrient deficiencies or hidden hunger because these people can not afford to buy enough vegetable, fruits, legumes, fish and meat. Their food does not contain essential micronutrients specially iron, iodine, zinc and vitamin-A. Breeding of crops with higher levels of vitamins, minerals or higher protein and healthier fats is called biofortification. This is the most practical aspect to improve the health of the people

20 **(a)** 

In protoplasm fusion the enzyme required are cellulose, hemicellulose and pectinase

22 **(d)** 

All statements are correct

23 **(c)** 

In callus culture, cell division in explant forms a callus. Callus is irregular unorganized and undifferentiated mass of actively dividing cells. Darkness and solid medium gelled by agar stimulates callus formation. The culture medium contains growth regulators auxin 2, 4-D and often a cytokinin like BAP. Both of these growth regulators stimulate meristematic property in callus

28 (a)

The plant cell without the cell wall is called protoplast. Naked protoplasts surrounded only by plasma membranes

29 **(c)** 

Cellular totipotency, is the ability of a cell to give rise to a complete plant, when cultured in a suitable culture medium at appropriate temperature and aeration condition

30 **(c)** 

Continued inbreeding usually reduces fertility of animals and even their productivity. This condition is called inbreeding depression. Such kind of inbreeding depression in selected animals of the breeding population can be over come by mating them with unrelated superior animals of the same breed. Such type of mating usually helps to restore fertility and yield

### 31 **(c)**

Mating between unrelated members of the same breed is called out crossing. However, the mating partners should not have common ancestors on either side of their pedigree up to 4-6 generation. Out crossing is usually preferred in animals having poor productivity of milk, poor growth rate and suffering from inbreeding depression

### 32 **(b)**

Mutation is a phenomenon by which genetic variation is achieved through changes in the base sequences with in genes, which creates a new character or trait absent in parental generation. Mutation which occur naturally are called spontaneous mutations and those which are induced artificially are called induced mutations. The application of induced mutation for crop improvement is called mutation breeding

### 33 **(a)**

Breeding is carried out by the conventional breeding techniques or by mutation breeding. The conventional method of breeding for disease resistance is that of hybridization and selection. Mutation breeding is defined as the process of breeding by artificially inducing mutations using chemicals (like aniline) or radiations like (gamma radiation). This radiation breeding is nothing but the step of Mutation breeding

### 34 **(d)**

Livestock are domesticated animals raised in an agricultural setting to produce commodities such as food, fibre and labour,  $e.\,g.$ , sheep, pigs, camels, cattle and buffaloes, etc.

#### 36 **(b)**

Breeding involves crosses between useful animal breeds aiming to increase the yield of animals and to improve the desirable qualities of the produce

### 38 **(c)**

Isinglass is produced from the air bladder of cat fishes and carps. Isinglass is principally used for clarifying wines, beer and making purse, honey, comb, book and ribbon. The isinglass prepared in Russia is of the best quality in the world

### 39 **(a)**

The enzyme used for isolation of single cell from explant cell is pectinase. The cell walls of cell are digested by enzymes like pectinase and cellulase to expose the naked protoplasts

### 40 **(d)**

Dairying is the management of animals, which provide milk and its products for human

consumption

### 42 **(a)**

One of the examples of cross breeding is the production of a new breed of sheep, called Hisardale. This breed was developed in Punjab by crossing Bikaneri ewes and marino rams

### 43 **(d)**

Fish as Food The fish flesh is an excellent source of protein has very little fat, carries a good

amount of minerals and vitamins-A and D and rich in iodine

**Source of Income** Millions of fisherman and farmers, particularly in coasted states, are engaged in this business which has an important place in Indian economy

**Aesthelic Value** A large number of fish are cultured in aquarium for their beauty and graceful movements

### 44 **(c)**

Lysine and tryptophan are essential amino acid. Our body can not synthesis atleast 8 amino acid (10 in children) which must be provided in the diet from outside. These eight amino acids are called essential amino acids. Thus, these essential amino acids, when present in the protein of our diet in sufficient amount, constitute protein quality

### 45 **(a)**

In mung bean resistance to yellow mosaic virus and powdery mildew were introduced by mutations

### 46 **(d)**

Conventional breeding method is carried out by the following steps

- (i) Selection and screening of germplasm for disease resistance
- (ii) Hybridisation of selected plants
- (iii) Testing and release of new varieties into the market

Mutation breeding is carried out by the following steps

- 1. Inducing mutations in plants
- 2. Screening the plant for resistance
- 3. Selecting the desirable plant for multiplication for breeding

### 47 **(d)**

Breeding involves crosses between useful animal

breeds, aiming to increase the yield of animals and to improve the desirable qualities of the produce

### 49 **(a)**

The outcome of increased resistance power in crops enhances food production. This also help to reduce the dependency on use of fungicides and bacteriocides

### 51 **(d)**

Science of altering the genetic pattern of plants in order to increase their value and utility for human welfare is called plant breeding. Aim of plant breeding are to grow disease free, high yielding and early maturing varieties

### 53 **(b)**

Improved varieties of wheat suitable for Indian environment have been developed by hybridization and mutation

#### 54 **(a)**

Bee wax.

Bee wax is a product of industrial importance. It is used in the manufacture of cosmetics, shaving creams and polishes

#### 56 **(a)**

Fishery is a kind of industry, which is concerned with the catching, processing or selling of fish, shell fish (prawns and molluscs) or other aquatic animals such as crabs, lobster, edible oyester, etc.

### 57 **(a)**

The embryo which develops from somatic cell is called somatic embryo

#### 59 **(a)**

Plant breeding is the purposeful manipulation of plant species in order to create plant types that are better suited for cultivation give better yields and are disease resistant

#### 60 **(b)**

Rhode Island Red is a breed of domestic fowl, originated in America, characterized by a dark raddish-brown plumage and the production of brown eggs

#### 63 **(a)**

Aseel is an indigenous breed. Aseel is one of the best table bird but it cannot be raised for commercial purposes because of its poor growth and low fertility. The original aseel is a medium sized aggressive bird commonly known as the Reza or the Tikra. Pure specimens of this breed are now rare and are available with some fanciers in the parts of AP, Karnataka and UP

# in t 64 (c)

The bee wax obtained from the hives of honey bees is used in many industries for the preparation of cosmetics and polishes

### 65 **(c)**

Both (a) and (b).

In 1963 the increase in crop production was due to introduction of semi-dwarf varieties of wheat. Semi-dwarf wheat was developed by Norman E. Borlaug at International Centre for Wheat and Maize Improvement in Mexico. Semi-dwarf varieties of rice were developed from IR-8 (developed at International Research Institute Phillipines) and Taichung Native-1 (developed in Taiwan)

### 75 **(a)**

In tissue culture, shoot regeneration is promoted by cytokinin, and root generation is promoted by auxin like NAA (Naphthalene Acetic Acid). An excess of auxin promotes root regeneration, whereas that of cytokinin promotes shoot regeneration. Roots regenerates from the lower end of these shoots to give complete plantlets

### 76 **(c)**

During the last two decades due to impact of blue revolution there has been a rapid global expansion of commercial aquaculture and it is now contribute significantly to the total global sea food production

### 78 **(c)**

Keeping beehives in crop fields during flowering period increases pollination efficiency and improves the yield, which is beneficial to both from the point of view of crop yield and honey yield

### 80 **(d)**

More than 840 million people in the world do not have adequate food to meet their daily requirements. Three billion people suffer from protein, vitamins and micronutrient deficiencies or hidden hunger because these people can not afford to buy adequate vegetable, fruits, legumes, fish and meat

### 82 **(c)**

International rice Research Institute is situated of Manila (Philippines) and Indian Rice Research Institute situated at Cuttack

### 83 **(b)**

Pomato is somatic hybrid between potato and tomato and Bomato is somatic hybrid between brinjal and tomato. Somatic hybrid are also produced between rice and carrot

#### 84 **(c)**

Apiculture or bee culture is the rearing of honey bees by culturists in different parts of the world to obtain honey and bees wax on commercial scale. Both the products are used in medicines, cosmetics and various other industries. Now-aday bee venom is also collected on commercial scale for the treatment of snake bite, arthritis and many other diseases

### 85 **(b)**

Somatic hybridization or parasexual hybridisation involves the fusion of isolated protoplasts of two different species

#### 91 **(d)**

Animal husbandry is the agricultural practice of feeding, breeding and raising animal livestock whose primary purpose is to provide meat and milk. Meat animals include beef, cattle, sheep and meat goats. Milk animals include cows and buffaloes.

Poultry is a class of domesticated fowl used for food and for their eggs. Fisheries is also an important source of animal food, which is concerned with rearing, catching and selling of fish, molluscs (shell fish) and crustaceans prawns, crabs, etc.

### 92 **(a)**

The agents which are used to induce mutation are called mutagens. Some common mutagens are radiation UV-rays, gamma rays, etc. Chemical – aniline, nitrous acid, mustard gas, etc.

#### 94 **(c)**

In our country, poultry mainly means chickens domesticated for eggs and meat Cow milk is slightly yellow in colour due to presence of carotene, which is precursor for yellow colour in cow milk is in the form of vitamin-A

### 97 **(a)**

The most common egg-type variety used for commercial production through out the world is leghorn

### 98 **(d)**

8-32 celled embryo.

MOET is program for herd improvement in animal like cattle sheep, rabbits, buffaloes, mare, etc. A cow is administered hormones with FSH-like activity to induce follicular maturation and supper ovulation

The cow produces 6-8 eggs instead of one egg produced normally

It is now, either mated with an elite bull or

artificial insemination is carried out

When the fertilized eggs attain 8-32 cells stage, they are non-surgically removed and transferred to a surrogate mother

The genetic mother can now be again superovulated

#### 101 **(b)**

Explant.

Plant tissue culture is a technique of growing cells, tissues or organs in sterilized nutrient media under controlled aseptic condition. The plant materials to be cultured may be cells, tissues or plant organs. The plant part which is used to culture is called explant

### 102 **(c)**

The vegetable sources of vitamins-A are fat and cholesterol free. Sources of vitamin-A are carrots, pumpkin, sweet potatoes, winter squashes, cantaloupe, pink grape fruit, apricots, broccoli, spinach, and most dark green, leafy vegetables

### 103 (a)

A group of animals, which are related by descent and share many similarities and referred to as breed

### 104 (a)

A successful breeding programme.

Germplasm is the sum to total of all the alleles of the genes present in a crop and its related species. The entire collection of plants/seeds having all the diverse alleles for all genes in a given crop is called germplasm collection. A good germplasm collection is essential for a successful breeding program

### 107 (c)

Healthy plants can be recovered from diseased plants by this method. Apical and axillary meristem is the only virus free part of a virus-infected plant. By removing the meristem and growing it *in vitro*, virus-free plants can be obtained

### 108 **(a)**

Sugar cane is an important cash crop. Sugarcane cultivator requires thick stem, long internodes, high sugar content and disease resistant crop

### 109 **(b)**

Hardening is the acclimatization of plants formed by tissue culture before growing in the field to make them strong to adapt in new environment

### 113 **(d)**

Mutation breeding is carried out by the following steps

Inducing mutations in plant by various means Screening the plant for resistance Selecting the desirable plant for multiplication and breeding

### 114 (a)

A-North, B-Poor, C-North, D-Higher

#### 117 (d)

Solid stems in wheat lead to non-preference by the stem sawfly. Insect resistance in host crop plants is due to morphological, biochemical or physiological characters

### 121 **(a)**

A-11 million, B-75 million, C-35 million, D-89.5 million

#### 122 **(d)**

Emasculation is the removal of anthers before maturity. It is useful for cross pollination and hybridization

#### 126 (a)

Genetic variability is the root any breeding program pre-existing genetic variability is collected from wild varieties, species and relatives of the cultivated crop species

#### 127 **(c)**

In 1963, ICAR introduced dwarf selections from CIMMYT, including those developed by Norman Borlaug using Norin-10 as the source of dwarfing genes

### 129 **(a)**

Cellular totipotency is a ability of cell to give rise to a complete plant, when cultured in a suitable culture medium at appropriate temperature and aeration condition

#### 130 **(d)**

All of these.

**Easy to Grow** Microbes can be grown on materials like waste water from potato processing plants, straw, molasses, animal manure and sewage

- (i) **Nutrient Rich** Provide food rich in protein, minerals, fats, carbohydrates and vitamin
- (ii) **High Yield** Due to high rate of biomass production and growth, large amounts are produced

### 133 **(b)**

Pisciculture.

Pisciculture is the breeding, hat ching and rearing of fish under controlled condition

#### 135 (a)

Wonder wheat is a new wheat variety with a yield of 18 tonnes per hectare. It has some 200 grains per stalk and has developed by Mexico's

international Wheat and Maize Improvement Centre

### 136 (d)

Somatic hybridization is a process of obtaining hybrids by fusion of protoplast *in vitro* 

#### 137 **(d)**

Some plants developed by meristem culture are banana, sugarcane and potato, etc. Healthy plants can be recovered from diseased plants by meristem culture

### 138 (d)

Culturing of isolated plant organ is called organ culture

### 139 **(b)**

Allopolyploid means a mixture of two different genetic forms. *Triticale* is first man made allopolyploid cereal crop

### 140 (d)

Honey is a sweet edible fluid of high nutritive value. It contains sugar, water, minerals, vitamins, amino acids, enzymes and pollen. It has a great importance for its medicinal value

### 141 **(b)**

Cereals and millets are mainly deficient in tryptophan amino acid. Tryptophan, an essential amino acids, is the largest of the amino acids. It is also a derivative of alanine, having an indole substituent on the  $\beta$ -carbon

### 142 (d)

Ranikhet disease is a common viral disease in poultry. Foot and mouth disease is a common viral disease in cattles. Anthrax is also found in cattles. Pebrine is a protozoan disease of silkworms

#### 143 (d)

Plant tissue culture is the technique of *in vitro* maintaining and growing plant cells, tissue or organ aseptically on artificial medium in suitable container under controlled conditions

#### 148 (c)

Cross hybridization is a time consuming and tedious process because it involves emasculation and bagging techniques to transfer desired pollen grains to a desire plant

### 149 **(b)**

The germ plasm collections are usually maintained at a low temperature in the form of seeds. The stored seeds are grown periodically in the field to obtain fresh seed. This is necessary because the seed germination decreases with storage time

### 151 (a)

GDP - Gross Domestic Product

### 152 (d)

List of fortified crop varieties released by

Crops	Nutrient rich
	in
Carrot, spinach and	Vitamin-A
pumpkin	
Bitter gourd, bathua,	Vitamin-C
mustard and tomato	
Spinach and bathua	Iron and
	calcium
Broad bean, lablab,	Protein
french bean and	
garden pea	

### 154 (a)

Norin-10 gene of dwarfness in wheat was orginated in Japan

### 155 (d)

III and IV.

Animal husbandry is the agricultural practice of feeding, breeding and raising animal livestock whose primary purpose is to provide meat and milk. Meat animals include beef, cattle, sheep and meat goats. Milk animals include cows and buffaloes.

Poultry is a class of domesticated fowl used for food and for their eggs. Fisheries is also an important source of animal food, which is concerned with rearing, catching and selling of fish, molluscs (shell fish) and crustaceans prawns, 169 (d) crabs, etc.

#### 156 **(b)**

Totipotency is the inherent capability of a single cell to provide the genetic programme required to direct the development of an entire individual

### 159 (c)

The method of growing or producing thousands of 170 (c) plants through tissue culture is called micropropagation

#### 160 (a)

Mutation breeding is defined as the process of breeding by artificially inducing mutations using chemicals (like aniline, nitrous acid mustard gas, etc.) or radiation (like gamma rays, X-rays, UV rays, etc.)

#### 162 (a)

Cyanobacteria.

Single cell proteins are the dried cells of microorganisms belonging to bacteria, yeasts, moulds, higher fungi and some algae Bacteria – *Methylophilus methylotrophus* Yeast - Candida utilis Cyanobacteria - Spirulina

### 164 (a)

The nutrient medium for tissue culture should have sucrose, inorganic salts, growth regulators, vitamins and amino acids

### 166 (d)

Mating of individuals from entirely different breed is called cross-breeding. It is the method of breeding superior male of one breed with superior female of another breed in order to combine the desirable qualities of two different breeds in the progeny. The hybrid progeny may be used directly for commercial production

### 168 **(b)**

Inbreeding involves

- (i) Identification and mating of superior males and superior females of the same breed in pairs
- (ii) Progeny obtained from such mating are evaluated and assessed for the desirable traits
- (iii) Again, the superior males and females are identified from the progeny
- (iv) It should be kept in mind that a superior cow or buffalo is that which gives more milk per lactation. Similarly, a superior bull is that which gives rise to superior progeny as compared to those of other bulls
- (v) This process is continued for 4-6 generation

Single cell proteins are the dried cells of microorganisms belonging to bacteria, yeasts, moulds, higher fungi and some algae Bacteria – *Methylophilus methylotrophus* Yeast - Candida utilis Cyanobacteria - Spirulina

Biofortification differs from ordinary fortification because it focusses on making plant foods more nutritious as the plants are growing rather than nutrients added to the foods when they are being processed

### 172 **(a)**

Hairy leaves of many plants are associated with resistance to insect pests. For example, resistance to Jassids in cotton and cereal leaf beetle in wheat

#### 174 (a)

A-Cow, B-Male, C-Bull, D-Superior progeny

### 177 **(d)**

Low, nitrogen, sugar and high aspartic acid in

maize develops resistance to maize stem borers

### 179 **(c)**

Black rot of crucifer-Bacterial disease

#### 180 (a)

High yielding and disease resistant wheat varieties were introduced in India in 1963, e.g., Sonalika and Kalyan Sona

#### 181 (a)

The most commonly maintained species of the bee by bee keepers is Apis mellifera. At present time, Apis mellifera is used in apiaries for large scale production of honey and wax

#### 184 (a)

High yielding and disease resistant wheat varieties are Sonalika and Kalyan Sona. Ratna and Jaya are semi-dwarf varieties of rice

#### 185 **(b)**

In cotton smooth leaf and absence of nector repel boll worms

### 186 **(d)**

Tissue culture technique can be utilized for the production of virus-free plants either by meristem 201 (a) culture chemotherapy or selective chemotherapy of larger explants from donor plants. Shoot apex consists of meristematic-cells, thus shoot apex culture is successful to obtain virus-free clones in crop improvement programmes

#### 188 (d)

A callus is an amorphous mass of loosely arranged thin walled parenchyma cells developing from proliferating cells of parents tissue An explant excised from a stem, tuber or root is used for callus formation

#### 190 (a)

Plant tissue culture is a technique of growing cells, tissues or organs in sterilized nutrient media under controlled aseptic condition. The plant materials to be cultured may be cells, tissues or plant organs. The plant part which is used to culture is called explant

### 191 (d)

Increasing homozygosity due to inbreeding results decrease in variation with in the group and stabilization of a particular type (i.e., pureline)

### 192 **(c)**

Both (a) and (b). Hilsa and Pomfrets The common marine fish varieties popularly consumed as food are hilsa, sardines, macherel, tuna, pomfrets, eel, Bombay duck, etc.

### 194 **(b)**

Deoni is a dual purpose breed usually famales are good milk yielder and the males serves in ploughing

### 195 **(d)**

The animals that we would expect in a dairy are cows, buffaloes, sheep and goats

#### 199 (a)

MOET is program for herd improvement in animal like cattle sheep, rabbits, buffaloes, mare, etc. A cow is administered hormones with FSH-like activity to induce follicular maturation and supper ovulation

The cow produces 6-8 eggs instead of one egg produced normally

It is now, either mated with an elite bull or artificial insemination is carried out When the fertilized eggs attain 8-32 cells stage, they are non-surgically removed and transferred to a surrogate mother

The genetic mother can now be again superovulated

Selection is the oldest method of crop improvement

The act or process of mating organisms of different varieties or species to create a hybrid is called hybridization

An organism which possesses more than two sets of chromosomes is called polyploidy, e.g., *Triticale* is the first man made crop derived by crossing wheat and rye

The application of induced mutations for crop improvement is called mutation breeding Our conventional method of crop improvement involve the whole genomes of plants. However, the latest genetic engineering involves transfer of one or more genes from one plant to another. The plant is which a foreign genes have been introduced is called transgenic plant

### 203 (a)

The maintenance of hives of honey bees for the production of honey is termed bee keeping or apiculture. Bee-keeping is practiced in any area where there is availability of sufficient bee pasture of some wild shrubs, fruit orchards and cultivated crops

### 205 (d)

**Easy to Grow** Microbes can be grown on materials like waste water from potato processing plants, straw, molasses, animal manure and sewage (i) **Nutrient Rich** Provide food rich in protein,

minerals, fats, carbohydrates and vitamin (ii) High Yield Due to high rate of biomass production and growth, large amounts are produced

### 206 **(c)**

Cultivation of axillary or apical shoot meristem is known as meristem culture. It involves the development of an already existing shoot meristem and subsequently the regeneration of adventitious roots from the developed shoots. Meristem culture can be used for rapid clonal multiplication, production of virus free plants, germplasm conservation and production of transgenic plants

### 207 **(c)**

Sonalika and Kalyan Sona. High yielding and disease resistant wheat varieties were introduced in India in 1963, e.g., Sonalika and Kalyan Sona

### 209 **(d)**

Plant breeding programme designed to increase the vitamins, minerals, higher protein and heat their fat content in crop yields is called biofortification

### 212 (a)

In callus culture, shoot and root regenerations are 236 (d) controlled, generally, by auxin-cytokinin balance. Usually, the excess of auxin (such as Naphthalene acetic. Acid or NAA), promotes root regeneration, whereas that of cytokinin (like BAP) promotes shoot regeneration

#### 213 (a)

Semi-dwarf varieties of rice were developed from IR-8 and Taichung Native-1

### 215 (c)

India's wheat yield revolution in the 1960s was possible primarily due to the quantitative trait mutations

### 221 **(b)**

Single cell protein refers to sources of mixed proteins extracted from pure or mixed culture of organisms or cell

### 223 **(c)**

The introduction of high yielding varieties of seeds and the increased use of fertilisers and irrigation are known collectively as the green revolution, which provided the increase in production needed to make India self sufficient in food grains, thus improving agriculture in India

#### 224 **(b)**

When the nuclear genetic material of one of the

parents is eliminated through the cytoplasm from both the parents are retained, such a fusion product is called hybrid (cytoplasmic hybrid or heteroplast)

### 226 (a)

The deficiency of essential micronutrients specially iron, iodine, zinc and vitamin-A in food increases the risk for diseases, reduces mental ability and life span

#### 228 **(a)**

The method of producing thousands of plants through tissue culture is called micropropagation. Each of these plants will be genetically identical to the original plant from which they were grown, i.e., they are somaclones. Many important food plants like tomato, banana, apple, etc., have been produced on commercial scale using this method

### 235 (c)

Germplasm is the sum to total of all the alleles of the genes present in a crop and its related species. The entire collection of plants/seeds having all the diverse alleles for all genes in a given crop is called germplasm collection. A good germplasm collection is essential for a successful breeding program

The chances of catching bird flu from a property cooked chicken and egg can be nil. The major causes of diseases in the poultry birds are overcrowding, dampness, insufficient light, unhygienic environmental condition and dirty air

### 237 (a)

Callus is an unorganized and undifferentiated mass of actively plant cells grown on culture medium from an explant. In 1939 White, Gautheret and Nobecourt independently succeeded in raising callus

#### 238 **(c)**

The term 'totipotency' refers to the development of an organ from a cell in a culture medium

### 242 (a)

All given statements are correct

### 245 (a)

A-Female horse; B-Male donkey. Mating between male and female animals of two different species is called interspecific hybridization. The Mule is the best example of a successful cross between two different species, the female horse and the male donkey

### 246 (c)

A natural mutant of *T. turgidum* is represented by

tetraploid *T. durum* (4n=28) which was crossed with diploid wild grass, *Aegilops squarrosa* (2n=14) under natural conditions. The resultant triploid hybrid was sterile which on doubling of chromosomes produced the hexaploid bread wheat. *Triticum aestivum* (6n=42)

### 247 (d)

Interspecific hybridization.

Mating between male and female animals of two different species is called interspecific hybridization. The Mule is the best example of a successful cross between two different species, the female horse and the male donkey

### 251 (d)

An explant is the excised piece of tissues or organs used for culture. An explant before organogenesis is heterotrophic which grows on a synthetic medium and sucrose is the most commonly used carbon source

### 254 (a)

Production of edible proteins on a large scale by means of microorganisms for animal and human nutrition is called single cell protein

### 258 (d)

All of these.

Mutation breeding is defined as the process of breeding by artificially inducing mutations using chemicals (like aniline, nitrous acid mustard gas, etc.) or radiation (like gamma rays, X-rays, UV rays, etc.)

### 259 (a)

The genetic ability of a plant to prevent pathogen from causing disease is called resistance

### 262 (a)

Phytotron is a chamber, in which the plants can be grown in controlled condition for the study of the effects of environmental conditions on their growth

#### 263 (a)

Sometimes other improved techniques are carried out to ensure successful production of hybrids. One such technique is Multiple Ovulation Embryo Transfer Technology (MOET) for herd improvement in animals like cattle, sheep, rabbits, buffaloes. In this high milk yielding breeds of female have been breed with high quality meat yielding bull to increase hard size in lesser time

#### 268 (a)

Usually the most common places for keeping beehives are courtyard, on the verandah of the house, on the roof, in the crop fields during flowering period, etc.

The beehives when kept in the fields of sunflower, *Brassica*, apple and pear, increase the pollination efficiency of flowering plants and improve the yields. A successful bee keeping requires management of beehives during different seasons

#### 272 (d)

The semen may be used immediately or can be frozen. Frozen bovine semen is a method of preserving semen for future artificial insemination, even after the death of the donor

### 274 **(a)**

MOET This technique has been successfully used for cattle rabbits, sheep, cows, buffaloes, mares etc. Animal breeders are hopefully looking forward to increase the herd size in a short time by using this technique

### 276 **(a)**

The most common species of honey bee is *Apis indica*. The exotic varieties are *Apis mellifera* (An Italian variety) and *Apis adamsoni*. At present, the Italian variety *Apis mellifera* is used in apiaries for large scale production of honey and wax

### 278 **(b)**

Outbreeding.

Rearing of honey bees is practiced for obtaining honey and wax. Honey is used as a food of very high nutritive value, while bees wax is used in industry to prepare cosmetics and polishes

### 279 (d)

Saccharum barberi and S. officinarum these two species were crossed to have sugar cane varieties combining the desirable qualities of high sugar, high yield, thick stems and ability to grow in the sugar cane belt of North India

### 280 (d)

All of these.

**Easy to Grow** Microbes can be grown on materials like waste water from potato processing plants, straw, molasses, animal manure and sewage

- (i) **Nutrient Rich** Provide food rich in protein, minerals, fats, carbohydrates and vitamin
- (ii) **High Yield** Due to high rate of biomass production and growth, large amounts are produced

### 289 (a)

The yellow colour of cow milk is due to the carotene, which is precursor for yellow colour in cows milk and it is in the form of vitamin-A

### 292 **(d)**

Fisheries is an industry, where fish are reared for

commercial purposes. Fisheries include rearing, catching, selling, etc., of fish, molluscs (shell-fish) and crustaceans (prawns, crabs, etc.)

#### 293 (d)

The wax gland in honey bee is found in workers. The wax gland complex of the honey bee worker consists of 3 cells types, epithelial cells, oenocytes and adipocytes, which act synergistically to secrete wax, a complex mixture of hydrocarbons, fatty acids and proteins (lipophorins)

### 294 (d)

Inbreeding refers to mating of more closely related individuals within the same breed for 4-6 generations

### 295 (d)

All the points given in the question are required to get the desired character into the crop

### 297 **(a)**

The process of fusion of protoplast of somatic cells obtained from different varieties or species of plant on a suitable nutrient medium *in vitro* to develop a somatic hybrid is called somatic hybridization

### 298 (a)

Pisciculture is the breeding, hat ching and rearing of fish under controlled condition

#### 299 **(b)**

Susceptibility, aggressive pathogen and conductive environment are responsible for development of disease in a plant

#### 300 **(b)**

Catla, rohu, common carp are fresh water fishes

### 301 (a)

The temperature of poultry shed should be optimum not high or not to low

#### 302 (a)

SCP production is based on industrial effluents so it helps to minimize environment pollution *Spirulina* can be grown easily on material like waste water from potato processing plants, straw, molasses, animal manure and even sewage. Such utilization also reduces environmental pollution

### 303 **(d)**

Conventional agriculture production of cereals, pulses, vegetables, fruits, etc., may not be able to meet the demand of food at the rate at which human and animal population is increasing. More than 25% of human population is suffering from hunger and malnutrition. One of the alternate sources of proteins for animal human nutrition is single cell protein

### 306 **(d)**

All of these.

Poultry includes the class of domesticated fowl (birds) used for food or for their eggs. The common poultry birds are chickens, turkeys, ducks, geese, quinea-fowls and pigeons

### 307 **(d)**

Pomato.

Pomato is somatic hybrid between potato and tomato and Bomato is somatic hybrid between brinjal and tomato. Somatic hybrid are also produced between rice and carrot

### 308 **(b)**

Micropropagation can be defined as growing plants from seed or small pieces of tissue under sterile conditions in a laboratory on specially selected media. This techniques include *in vitro* (Literally –in glass) laboratory propagation from vegetative material and germination of seeds and spores

### 311 **(d)**

None of above statement is false

### 312 **(b)**

The capacity of a cell explant to grow into a whole plant is called totipotency

## 314 **(a)**

Emasculation is the process of removal of anthers from a bisexual flower before the anthers get maturd

### 316 (d)

All of these.

Three billion people suffer form protein, vitamins, and micronutrient deficiencies or hidden hunger because these people can not afford to buy enough vegetable, fruits, legumes, fish and meat. Their food does not contain essential micronutrients specially iron, iodine, zinc and vitamin-A. Breeding of crops with higher levels of vitamins, minerals or higher protein and healthier fats is called biofortification. This is the most practical aspect to improve the health of the people

### 317 **(c)**

Somatic hybridization involves the fusion of protoplasts of two different species which results in the formation hybrids. Naked protoplasts are obtained by dissolution of their cell walls by the macerating enzymes such as pectinase and cellulose. Fusion of protoplasts from the two different varieties can be enhanced by treating with Polyethylene Glycol (PEG) in presence of

high voltage electric current

### 319 (a)

Mirobes Like *Spirulina, Methylophilus methylotropus* can be grown in industrial scale as sources of good protein

### 320 **(b)**

Resistance is the capacity of plants to resist, withstand, lessen and overcome the attacks of pathogens. Some host genotypes have the ability to prevent a pathogen strain from producing disease. Such host lines are called resistant and this ability is called disease resistance. Disease resistance crop is obtained from crossing with wild varieties

### 321 **(d)**

More than 70% of the world livestock population is in India and China, but its contribution is only 25%

### 323 **(a)**

Pollen culture haploid plants may be obtained from the pollen grains by placing anther or isolated pollen grains on a suitable culture medium

### 328 **(c)**

Rearing of honey bees is practiced for obtaining honey and wax. Honey is used as a food of very high nutritive value, while bees wax is used in industry to prepare cosmetics and polishes

### 330 **(d)**

The common marine fish varieties popularly consumed as food are hilsa, sardines, macherel, tuna, pomfrets, eel, Bombay duck, etc.

### 331 **(b)**

Biofortification differs from ordinary fortification because it focusses on making plant foods more nutritious as the plants are growing rather than nutrients added to the foods when they are being processed

#### 333 (d)

Professor FC Steward of Cornell University (USA) demonstrated that mature cells removed from a carrot and placed in a suitable culture solution could be stimulated to start dividing again and to provide new carrot plants (totipotency). Totipotency is the inherent capability of a single cell, which provides the genetic programme required to direct the development of an entire individual

### 334 **(b)**

Honey is a neutral sweet syrup extracted from the tires of honey bees. The chemical composition of

honey is ash 01.00%, enzyme and pigments 02.21%, maltose and other sugar 08.81%, water 17.20%, dextrose 21.28% and levulose 88.90%

### 336 **(c)**

Atlas-66, soft wheat, has been used since 1953 as a genetic source of higher protein in wheat. It has been used as a donor for improving cultivated wheat

#### 338 **(a)**

Semi-dwarf rice varieties were introduced in India in 1966. Semi-dwarf varieties of rice were developed from IR-8 and Taichung Native-1

### 339 **(b)**

Cultivation of fishes in artificially prepared ponds or water bodies is called pisciculture. Fish farming in isolated water bodies is called pisciculture

### 346 (c)

The practices concerned with the improvement in animal husbandry include management of farm and farm animals and animal breeding

### 350 **(c)**

Several South Indian states raise 2-3 crops of rice annually. The agronomic feature that makes this possible is because of early yielding rice variety

### 352 (c)

Animal breeding is producing improved breeds of domesticated animals, by improving their genotype through selective mating

### 353 **(b)**

A 250 kg cow produces 200g of protein per day. In the same period, 250 g of a microorganism like *Methylophilus methylotrophus*, because of its high rate of biomass production and growth, can be expected to produce 25 tonnes of protein

### 357 **(d)**

Green revolution depended mainly on plant breeding techniques for high yielding and disease resistant varieties in wheat. This was all done by the efforts of Prof. MS Swaminathan who is also called father of green revolution in India

### 358 (d)

Crustacean fishery is connected with exploitation of lobsters, crabs and prawns

### 359 (c)

The art and science of combining, ideas, facilities, process, materials and labour to produce and market a worth while produce or service successfully called management

### 360 **(a)**

Poultry.

Poultry includes the class of domesticated fowl

(birds) used for food or for their eggs. The common poultry birds are chickens, turkeys, ducks, geese, quinea-fowls and pigeons

### 361 **(b)**

All the given symptoms are infectious coryza disease of poultry birds

#### 366 (a)

It is estimated that more than 70% of the world livestock population is in India and China. However, it is surprising to not that the contribution to the world farm produce is only 25%, *i.e.*, the productivity per unit is very low

### 367 **(d)**

The plant tissue or organ excised and used for *in vitro* culture is known as explant. Any plant part such as shoot tip, root tip, leaf tip, pollen grains, etc., may be used as an explant. The choice of explant depends mainly on the objective of the culture and the regeneration potential of the different organs of a plant species

### 371 **(b)**

Alfatoxicosis represents one of the serious diseases of poultry, livestock and other animals. The cause of this disease in poultry and other food producing animals has been attributed to the ingestion of various feeds contaminated with *A. flavus* 

### 372 **(b)**

Haploids have a single genome as found in the gametes of the species. A haploid has only one copy of each chromosome and is highly sterile. Guha and Maheshwari (1964) developed a culture technique to produce haploid plants It is called androgenic haploid culture, in which very young unopened sterilized flowers are opened to remove young anthers. Anthers are introduced over culture medium for 4-6 weeks, to a give rise to large number of embryoids (haploids)

### 374 **(c)**

1963.

High yielding and disease resistant wheat varieties were introduced in India in 1963, *e. g.*, Sonalika and Kalyan Sona

### 376 **(d)**

Bees are the pollinators of many of our crop species, such as sunflower, *Brassica*, apple and pear

### 377 **(a)**

Somaclones are obtained by tissue culture. The plant regenerated from cell and tissue cultures

shows heritable variation for both qualitative and quantitative traits. Plant breeding is the branch of biology, which is concerned with developing varieties superior to existing one. Irradiation means exposure to any form of radiation. Genetic engineering is the technique by which genetically modified organisms are obtained

### 379 (c)

Mirobes Like *Spirulina, Methylophilus methylotropus* can be grown in industrial scale as sources of good protein

### 381 **(d)**

Shakti, Rattan and Protina are recently developed composite (germplasm complex) varieties of maize, which have a higher lysine and tryptophan content than traditional maize varieties

### 382 **(c)**

The part of the plant taken for tissue culture is called explant

### 383 **(c)**

Lysine is an essential amino acid found in maize

### 384 **(d)**

The application of induced mutations for crop improvement is called mutation breeding. The agents which are used to induce mutations are called mutagens

### 386 **(c)**

In this case, more number of genes for high yielding milk are inherited from both the parents

#### 387 **(b)**

International Centre for Wheat and Maize Improvement Mexico.

Semi-dwarf rice varieties were introduced in India in 1966. Semi-dwarf varieties of rice were developed from IR-8 and Taichung Native-1

#### 389 (d)

In bhindi (*Abelmosshcus esculentus*) resistance to yellow mosaic virus was introduced from a wild species resulting a new variety called Parbhani kranti

### 392 **(b)**

New castle Disease (ND) is a highly contagious disease of birds caused by a paramyxo virus

### 393 **(b)**

A-One, B-Ovary, C-Ovulation, D-Hormone, E-More, F-4 to 10, G-Surrogate mother

#### 395 **(b)**

The SCP is rich in high quality of protein and poor in fat content

### 399 (c)

250 g of a microorganism like Methylophilus

*methylotropus* because of its high content of biomass production and growth, can be produce about 25 tonnes of protein

### 401 **(c)**

Crustaceans from very large group of arthopods, which include crabs, lobsters prawns, etc.

#### 402 (a)

Saccharum barberi and Saccharum officinarum are varieties of sugar cane. S. barberi and S. officinarum were crossed to obtain sugar cane varieties having desirable qualities

#### 403 (d)

Conventional plant breeding is in practice from the 9000-11000 years ago. Most of our major food crops are derived from the domesticated varieties. But now due to advancements in genetics, molecular biology and tissue culture, plant breeding is being carried out by using molecular genetic tools.

Classical plant breeding includes hybridization of purelines, artificial selection to produce plants with desirable characters of higher yield, nutrition and resistance to disease

### 407 **(d)**

In mung bean, resistance to yellow mosaic virus acid powdery mildew were introduced by mutations

### 409 (a)

Apiculture is the rearing of bee or bee keeping for the production of honey and wax

### 410 (a)

Quality of breeds.

In dairy farm management, the people deals with processes and systems that increase yield and improve quality of milk. Milk yield is primarily dependent on the quality of breeds in the farm

### 416 (a)

The management of animals for milk and its products for human consumption is called dairying. Milk yield here is dependent primarily on the quality of breeds

#### 417 (c)

The cell walls of cells are digested by enzymes like pectinase and cellulose to expose the naked protoplast

#### 419 (d)

All of these are advantages of tissue culture/miropropagation

### 421 **(d)**

Crustacean fishery is connected with exploitation of lobster crab and prawn

### 422 (d)

Cross breeding refers to the cross of superior males of one breed with superior females of another breed. The progeny may be used for commercial production, *e. g.*, a new sheep breed Hisardale

In case of artificial insemination the semen can be used immediately or can be frozen for later use Artificial insemination is a method of controlled breeding in which semen from the selected male parent is injected into the reproductive tract of the selective female parent. Multiple Ovulation Embryo Transfer (MOET) Technology is a programme for herd improvement

### 425 **(c)**

Culturing of aquatic plant and animal is done in fresh water bodies is called aquaculture

### 426 **(d)**

Virus.

Bird flu resembles influenza and is caused by a virus H5N1. The virus enters the man through chicken

### 427 **(d)**

The host crop plant may be resistant to insect pests due to morphological, biological and physiological characteristics

#### For Examples

- (i) Hairy leaves of plants resistance to jassids in cotton and cereal leaf beetle in wheat
- (ii) In maize, high aspartic acid, low nitrogen and sugar content protect them from stem borers

#### 429 (a)

Outbreeding refers to the mating of unrelated animals belonging to

- (i) Individuals of the same breed but having no common ancestors
- (ii) Individuals of the different breeds (cross breeding)
- (iii) Individuals of different species (inter-specific hybridization)

Thus, outbreeding may be divided into three different types on the basis of the individual selected for mating. These are outcrossing, crossbreeding, interspecific hybridization and controlled breeding using artificial insemination

#### 430 (a)

A-Cellulase and pectinase, B-Polyethylene glycol, C-Somatic hybrid cell

### 431 **(b)**

Variety of wheat is Himgiri Pusa A-4

432 **(c)** 

Seeds from virus infected plants generally do contain the virus. Therefore, sexual progeny are usually virus free, except for new-infections. But this belief is not entirely correct. In case of sexually reproducing crop virus infections spread rapidly.

This is because of vegetative propagules from virus infected plants contain virus particle, hence in vegetatively propagated plants the virus gets transmitted through propagule (rhizome/bulb/tuber/root). But the growing bud is not infected (*i.e.*, shoot tips are virus free)

#### 433 (a)

Bird flu resembles influenza and is caused by a virus H5N1. The virus enters the man through chicken

### 434 (c)

When a hybrid is produced by fusion of somatic cells of two varieties or species, it is called as somatic hybrid. The process of producing somatic hybrids is called somatic hybridisation. The hybrid protoplast contains characters of both parental protoplast

### 435 (a)

Norman E Borlaug.

In 1963 the increase in crop production was due to introduction of semi-dwarf varieties of wheat. Semi-dwarf wheat was developed by Norman E. Borlaug at International Centre for Wheat and Maize Improvement in Mexico. Semi-dwarf varieties of rice were developed from IR-8 (developed at International Research Institute Phillipines) and Taichung Native-1 (developed in Taiwan)

### 436 **(a)**

The microorganisms used in the production of SCP use such substrates which otherwise cause pollution. Therefore, production of SCP helps in reduction of pollution

### 437 (a)

Inbreeding refers to mating between closely related individuals with in the same breeds for 4-6 generation. It identify superior males and superior females

### 439 **(d)**

A-Saccharum barberi; B-Saccharum officinarum

#### 440 (d)

Some of the fresh water fishes, which are very common include rohu, catla, calbasu, mrigal,

chital, common carp, etc.

### 444 (d)

Molluscs has a shell-like exoskeleton. So, molluscs are also called as shell fish

### 445 **(b)**

Micropropagation.

Micropropagation can be defined as growing plants from seed or small pieces of tissue under sterile conditions in a laboratory on specially selected media. This techniques include *in vitro* (Literally –in glass) laboratory propagation from vegetative material and germination of seeds and spores

### 446 (c)

Bee-keeping or apiculture is an important enterprise of agriculture concerned with the maintenance of hives of honey bees for the production of honey and wax

#### 447 (a)

Poultry includes the class of domesticated fowl (birds) used for food or for their eggs. The common poultry birds are chickens, turkeys, ducks, geese, quinea-fowls and pigeons

### 448 (d)

G Haberlandt gave the idea that every cell is totipotent

#### 450 **(d)**

Crab, oyster, lobster are edible aquatic animal

### 453 (c)

In dairy farm management, the people deals with processes and systems that increase yield and improve quality of milk. Milk yield is primarily dependent on the quality of breeds in the farm

### 456 (d)

The process of breeding, when occurs between closely related individuals of the same breed, is called inbreeding. On the other hand, the process of breeding between unrelated animals, which may be between different breeds or different species, is called outbreeding

### 458 **(b)**

Father of white revolution in India is verghese kurein. White revolution is huge production of milk in 1970s in dairy milk and milk products

### 459 (d)

Dharwar American variety of cotton is the product of parasexual hybridization

#### 463 (a)

All given statements are correct