DPP - Daily Practice Problems

Chapter-wise Sheets

Date : | Start Time : | End Time :

BIOLOGY CB31

SYLLABUS : Strategies for Enchancement in Food Production

Max. Marks : 180 **Marking Scheme :** + 4 for correct & (–1) for incorrect **Time : 60 min.**

INSTRUCTIONS : This Daily Practice Problem Sheet contains 45 MCQs. For each question only one option is correct. Darken the correct circle/ bubble in the Response Grid provided on each page.

1. Parthenocarpic tomato fruits can be produced by
(a) treating the plants with low concentrations of gibberellic acid and auxins
(b) raising the plants from vernalized seeds
(c) treating the plants with phenylmercuric acetate
(d) removing androecium of flowers before pollen grains are released

2. The technique of obtaining large number of plantlets by tissue culture method is called
(a) Plantlet culture
(b) Organ culture
(c) Micropropagation
(d) Macropropagation

3. Breeding of crops with high levels of minerals, vitamins and proteins is called
(a) Somatic hybridisation
(b) Biofortification
(c) Biomagnification
(d) Micropropagation

4. Jaya and Ratna developed for green revolution in India are the varieties of
(a) maize (b) rice
(c) wheat (d) bajra

5. Which one of the following pesticides is banned now a-days?
(a) DDT (b) Eldrin
(c) Aldrin (d) Toxaphene

6. Which one of the following is an exotic Indian fish ?
(a) *Catla catla*
(b) *Heteropneustes fossilis*
(c) *Cyprinus carpio*
(d) *Labeo rohita*

RESPONSE GRID	1. ⓐⓑⓒⓓ	2. ⓐⓑⓒⓓ	3. ⓐⓑⓒⓓ	4. ⓐⓑⓒⓓ	5. ⓐⓑⓒⓓ
	6. ⓐⓑⓒⓓ				

Space for Rough Work

7. Consider the following statements concerning food chains :
(i) Removal of 80% tigers from an area resulted in greatly increased growth of vegetation
(ii) Removal of most of the carnivores resulted in an increased population of deers
(iii) The length of food chains is generally limited to 3-4 trophic levels due to energy loss
(iv) The length of food chains may vary from 2 to 8 trophic levels
Which two of the above statements are correct?
(a) (ii) and (iii) (b) (iii) and (iv)
(c) (i) and (iv) (d) (i) and (ii)

8. Which one is a neem product used as insect repellent?
(a) Azadirachtin (b) Rotenone
(c) Parathione (d) Endrin

9. Bull semen for the purpose of artificial insemination is stored in
(a) Ice (b) Liquid oxygen
(c) Liquid nitrogen (d) Liquid CO_2

10. The 'Mule' is the result of
(a) Inbreeding depression
(b) Out breeding
(c) Cross breeding
(d) Inter-specific hybridization

11. In live stock breeding experiments the following stage is transferred to surrogate mothers
(a) Unfertilized eggs
(b) Fertilized eggs
(c) 8 to 32 celled embryo
(d) Frozen semen

12. The animal husbandry deals with the care, breeding and management of
(a) Domesticated animals
(b) Fishes
(c) Honey bees and silk worms
(d) All of these

13. Which of the following has been recently used for increasing productivity of super milk cows?
(a) Artificial insemination by a pedigree bull only
(b) Superovulation of a high production cow only
(c) Embryo transplantation only
(d) A combination of superovulation, artificial insemination and embryo transplantation into a 'carrier cow' (surrogate mother)

14. Which one of the following statements is correct in relation to honey bees?
(a) *Apis indica* is the largest wild honey bee in India
(b) Honey is predominantly sucrose and arabinose
(c) Beewax is a waste product of honey bees
(d) Communication in honey bees was discovered by Karl Von Frisch

15. 'Inland fishery' refers to
(a) Culturing fish in fresh water
(b) Trapping and capturing fishes from sea coast
(c) Deep sea fishing
(d) Extraction of oil from fishes

16. Which of the following combinations is generally recommended for composite fish farming in India?
(a) *Catla*, *Labeo*, *Cirrhinus*
(b) *Catla*, *Cyprinus*, *Clarias*
(c) *Clarias*, *Channa*, *Cyprinus*
(d) *Cirrhinus*, *Cyprinus*, *Channa*

17. Hinny is a hybrid of male
(a) Horse and female donkey
(b) Donkey and female horse
(c) Goat and female lamb
(d) Sheep and female goat.

18. When cross is made between two species of the same genus, then the cross is known as
(a) intraspecific hybridization
(b) interspecific hybridization
(c) intergeneric hybridization
(d) intervarietal hybridization

19. Which of the following is a viral disease of poultry birds?
(a) Anthrax (b) Ranikhet
(c) Coccidiosis (d) None of these

RESPONSE GRID					
	7. (a)(b)(c)(d)	8. (a)(b)(c)(d)	9. (a)(b)(c)(d)	10. (a)(b)(c)(d)	11. (a)(b)(c)(d)
	12. (a)(b)(c)(d)	13. (a)(b)(c)(d)	14. (a)(b)(c)(d)	15. (a)(b)(c)(d)	16. (a)(b)(c)(d)
	17. (a)(b)(c)(d)	18. (a)(b)(c)(d)	19. (a)(b)(c)(d)		

Space for Rough Work

20. Which one of the following processes of breeding increases homozygosity?
(a) Inbreeding
(b) Out breeding
(c) Cross breeding
(d) Inter-specific breeding

21. The most popular breed of fowl in India is
(a) White leg horn (b) Aseel
(c) Plymouth (d) Langshan

22. Murrah, Mehsana, Jaffarbadi are breeds of
(a) Buffalo (b) Cow
(c) Cattle (d) Horse

23. Consumption of which one of the following foods can prevent the kind of blindness associated with vitamin 'A' deficiency ?
(a) '*Flavr Savr*' tomato
(b) Canolla
(c) Golden rice
(d) Bt-Brinjal

24. Golden rice is a transgenic crop of the future with the following improved trait :
(a) insect resistance
(b) high lysine (essential amino acid) content
(c) high protein content
(d) high vitamin-A content

25. Use of transgenic plants as biological factories for the production of special chemicals is called–
(a) Molecular farming (b) Molecular genetics
(c) Molecular mapping (d) Dry farming

26. Main objective of production/use of herbicide resistant GM crops is to
(a) eliminate weeds from the field without the use of manual labour
(b) eliminate weeds from the field without the use of herbicides
(c) encourage eco-friendly herbicides
(d) reduce herbicide accumulation in food articles for health safety

27. In order to obtain virus- free plants through tissue culture, the best method is
(a) protoplast culture (b) embryo rescue
(c) anther culture (d) meristem culture

28. A collection of plants and seeds having diverse alleles of all the genes of a crop is called
(a) herbarium (b) germplasm
(c) gene library (d) genome

29. Which one of the following is a wrong matching?
(a) Somatic hybridization - Fusion of two diverse cells
(b) Vector DNA -Site for t-RNA synthesis
(c) Micropropagation - *in vitro* production of plants in large numbers
(d) Callus - Unorganised mass of cell produced in tissue culture

30. In tissue culture roots can be induced by
(a) no cytokinin and only auxins.
(b) higher concentration cytokinin and lower concentration auxins.
(c) lower concentration of cytokinin and higher concentration of auxins.
(d) only cytokinin and no auxins.

31. Three crops that contribute maximum to global food grain production are
(a) Wheat, rice and maize
(b) Wheat, rice and barley
(c) Wheat, maize and sorghum
(d) Rice, maize and sorghum

32. Himgiri developed by hybridisation and selection for disease resistance against rust pathogens is a variety of
(a) chilli (b) maize
(c) sugarcane (d) wheat

33. Bee dances are meant for
(a) Courtship (b) Communication
(c) Recreation (d) Instinct

34. Artificial insemination involves
(a) super ovulation (b) semen collection
(c) egg collection (d) embryo collection

RESPONSE GRID					
	20. ⓐⓑⓒⓓ	**21.** ⓐⓑⓒⓓ	**22.** ⓐⓑⓒⓓ	**23.** ⓐⓑⓒⓓ	**24.** ⓐⓑⓒⓓ
	25. ⓐⓑⓒⓓ	**26.** ⓐⓑⓒⓓ	**27.** ⓐⓑⓒⓓ	**28.** ⓐⓑⓒⓓ	**29.** ⓐⓑⓒⓓ
	30. ⓐⓑⓒⓓ	**31.** ⓐⓑⓒⓓ	**32.** ⓐⓑⓒⓓ	**33.** ⓐⓑⓒⓓ	**34.** ⓐⓑⓒⓓ

Space for Rough Work

35. The term "breed" refers to
(a) a group of animals not related by descent but similar in most characters
(b) a group of animals related by descent and similar in most characters
(c) a group of animals related by descent but have almost different characteristics
(d) a group of animals neither related by descent nor have similar characteristics.

36. What strategy would you suggest if a person wants to evolve a pureline in an animal?
(a) Cross-breeding (b) Inbreeding
(c) Out-breeding (d) Artificial insemination

37. Select the incorrect statement from the following.
(a) Apiculture provides additional income generating industry to the farmers.
(b) Bee keeping is labour intensive process.
(c) Bee venom is used to cure certain diseases like gout and arthritis.
(d) Honey is used as laxative, antiseptic and sedative.

38. Germplasm collection is the collection of
(a) germ cells
(b) semens
(c) plants/seeds with all the diverse alleles for all genes
(d) egg cells

39. Which of the following diseases is caused by virus?
(a) Tobacco mosaic (b) Late blight of potato
(c) Turnip mosaic (d) Both (a) and (c)

40. Single cell protein can be obtained from
(a) bacteria (b) algae
(c) fungi (d) all of these

41. Meristem culture is used
(a) to produce disease free plants
(b) in germplasm conservation
(c) in rapid clonal multiplication
(d) all of these

42. A plant cell without cell wall is called
(a) proplast (b) protoplast
(c) nucleoplasm (d) explant

43. Refer the given figures and answer the questions.

Which of the following statements is correct regarding the above figures?
(i) These are all Indian hybrid crops of low yielding varieties.
(ii) These are all Indian hybrid crops of high yielding varieties.
(iii) The production of the above crops led to dramatic increase in food production.
(iv) These crops are produced as a result of various plants breeding technique.
(a) (i), (ii), and (iii) (b) (ii), (iii) and (iv)
(c) (iii) and (iv) only (d) (i) and (iii) only

44. Match Column - I with Column - II

Column-I	Column-II
A. Hybrid variety	(I). X-ray
B. Mutation	(II). Allopolyploidy
C. Pure line	(III). F_1 generation
D. *Triticale*	(IV). Selection in self pollinated crops
	(V). Genetic engineering

(a) A-(III); B-(II); C-(I); D-(IV)
(b) A-(III); B-(I); C-(IV); D-(II)
(c) A-(I); B-(III); C-(IV); D-(II)
(d) A-(II); B-(I); C-(III); D-(IV)

45. Farmers in a particular region were concerned that pre-mature yellowing of leaves of a pulse crop might cause decrease in the yield. Which treatment could be most beneficial to obtain maximum seed yield ?
(a) Treatment of the plants with cytokinins along with a small dose of nitrogenous fertilizer
(b) Removal of all yellow leaves and spraying the remaining green leaves with 2, 4, 5- trichlorophenoxy acetic acid
(c) Application of iron and magnesium to promote synthesis of chlorophyll
(d) Frequent irrigation of the crop

RESPONSE GRID					
	35. ⓐⓑⓒⓓ	**36.** ⓐⓑⓒⓓ	**37.** ⓐⓑⓒⓓ	**38.** ⓐⓑⓒⓓ	**39.** ⓐⓑⓒⓓ
	40. ⓐⓑⓒⓓ	**41.** ⓐⓑⓒⓓ	**42.** ⓐⓑⓒⓓ	**43.** ⓐⓑⓒⓓ	**44.** ⓐⓑⓒⓓ
	45. ⓐⓑⓒⓓ				

Space for Rough Work

DAILY PRACTICE PROBLEM DPP CHAPTERWISE 31 - BIOLOGY			
Total Questions	45	Total Marks	180
Attempted		Correct	
Incorrect		Net Score	
Cut-off Score	55	Qualifying Score	60
Success Gap = Net Score – Qualifying Score			
Net Score = (Correct × 4) – (Incorrect × 1)			

HINTS & SOLUTIONS

DPP /CB31

1. (a) Parthenocarpy is the development of fruits without prior fertilization which results in the formation of seedless fruits. In some plant species, parthenocarpic fruits are produced naturally or they may be induced by treatment of the unpollinated flowers with auxin.
Removal of androecium before pollen release is called emasculation which is helpful in preventing unwanted pollination. Vernalized seeds are the chilled treated seeds for breaking dormancy. Phenyl Mercuric Acetate is an antitranspirant.
Gibberellins and Auxins are known to induce parthenocarpy in plants. If a tomato plant is treated with a low concentration of auxin and gibberellic acid it wll produce fruits without fertilization i.e. parthenocarpic fruits.

2. (a)

3. (b) Breeding of crops with high levels of minerals, vitamin and minerals is called biofortification. This is most practical aspect to improve the health of people.

4. (b) Jaya and Ratna are two rice varieties developed for green revolution in India.
- The scientific name of Jaya is IET-723. This paddy variety takes about 130 days to grow and the grain is long, bold and white. Its yield is 50-60 quintals per hectare.
- The scientific name of 'Ratna' is IET-1411. It takes about 130-135 days to grow. The grain is long, slender and white. Its yield is 45-50 quintal/hectare.

5. (a) DDT was subsequently banned for agricultural use worldwide under the Stockholm Convention, but its limited use in disease vector control continues to these days in certain parts of the world and remains controversial. Along with the passage of the endangered Species Act, the US ban on DDT is cited by scientists as a major factor in the comeback of the bald eagle in the contiguous US.

6. (c) *Catla catla* and *Labeo rohita* are the two Indian major carps whereas *Heteropneustes* is a catfish. *Cyprinus* is the exotic breed.

7. (a) Food chain is the transfer of energy from green plants (primary producers), through a sequence of organisms in a food chain occupying different trophic level. Therefore, statements (ii) and (iii) are correct.

8. (a) Azadirachtin is a chemical compound belonging to the limonoids. It is a secondary metabolite present in the Neem tree seeds. The molecular formula is $C_{35}H_{44}O_{16}$. Azadirachtin is a highly oxidised tetranortriterpenoid which boosts a plethora of oxygen functionality, comprising an enol ether, acetal, hemiacetal, and tetra-substituted oxirane as well as a variety of carboxylic esters. It is classified among the plant secondary metabolites.

9. (c) **10. (d)** **11. (c)** **12. (d)**

13. (d) In superovulation, a high milk yielding cow is induced to shed 4–6 eggs (instead of one) every 6–8 weeks (instead of 20–21 days). The superovulated donor is artificially inseminated with semen from a quality bull. The embryos developing from the eggs so fertilised are flushed out. These good quality embryos are now transferred to surrogate mother for delivery.

14. (d) Karl Von Frisch, carried out many experiments and determined that when a foraging bee returns to the hive, it performs a waggle dance. Honey is predominantly glucose and fructose. *Dorsata* is a bigger bee than *Apis indica* (a medium sized bee). Bees wax is secreted by special wax glands to make compartments.

15. (a) **16. (a)** **17. (a)** **18. (b)** **19. (b)** **20. (a)**

21. (a) White leghorn is a mediterranean breed.

22. (a)

23. (c) Golden rice is vitamin A rich variety developed by rDNA technology and used in the treatment of vitamin A deficiency.

24. (d) Golden rice is a transgenic crop of the future with high Vit. A content. Millions of people suffer from Vit. A deficiency which leads to vision impairment. Transgenic rice has been developed which is capable of synthesizing beta carotene, the precursor of Vitamin A. The rice variety is now being crossed into adapted varieties with field tests possible in an year or two.

25. (a)

26. (d) Main objective of production/use of herbicide resistant GM crops is to reduce herbicide accumulation in food articles for health safety. GM plants has been useful in many ways. Genetic modifications has made crops more tolerant to abiotic stresses, reduced reliance on chemical pesticides, enhanced nutritional value of food.

27. (d) In order to obtain virus-free plants through tissue culture, the best method is meristem culture. Meristem tip culture is used successfully to remove viruses, bacteria, in order to produce the greatest number of plants. Meristem culture is used to produce healthy propagation stock for crops and ornamentals.

28. (c) Gene library contains DNA fragments representing the entire genome of an organism. So collection of alleles of the genes of a crop is called gene library.

29. (b) Vector DNA are the DNA molecules that can carry a foreign DNA segment and replicate inside the host cells. Vector DNA may be plasmids, a bacteriophage, cosmids, yeast artificial chromosomes.

30. (c)

31. (a) Three crops that contribute maximum to global food grain production are Wheat, rice and maize, which belong to the family *Poaceae* (*Graminae*).

32. (d) 'Himgiri' developed by hybridisation and selection for disease resistance against rust pathogens is a variety of wheat. It is resistant to leaf/stripe rust and hill bunt.

33. (b)

34. (b) Controlled breeding experiments are carried out using artificial insemination. The semen is collected from the male and is injected either deep into the cervix or at the beginning of the body of the uterus of the selected female by the breeder. The semen may be used immediately or can be frozen and used later. It can also be transported in a frozen form.

35. (b) Breed is a group of animals related by descent and similar in most characters like general appearance, features, size, configuration, etc.

36. (b) Inbreeding strategies allow the desirable qualities of more closely related individuals to be continued within the same breed for 4-6 generations. It increases homozygosity and thus, is necessary for evolving a pure line. Continued inbreeding, especially close inbreeding usually leads to reduces fertility and even productivity. This is called inbreeding depression.

37. (b) Products of honey bee are honey, bee wax, bee venom and royal jelly. Medicinal importance includes its uses as laxative, antiseptic, sedative, etc. It is also used against digestive disorders. Bee venom is used to cure gout and arthritis. Bee

was is used is producing cosmetics, paints polishes, etc. It is not a labour intensive process and is source of additional income to the farmers.

38. **(c)** Germplasm is the sum total of all the alleles of the genes present in a crop and its related species. The germplasm of any crop species consists of the following types of materials: cultivated improved varieties, improved varieties that are no more in cultivation, old local or 'desi' varieties, pure lines produced by plant breeders, and wild species related to the crop species.

39. **(d)** Tobacco mosaic is caused by Tobacco Mosaic Virus. The infection causes characteristic patterns, such as "mosaic"-like mottling and discolouration on the leaves. Turnip Mosaic Virus causes turnip mosaic. Chlorotic lesions, mosaic and mottling are the common symptoms of this disease.

40. **(d)** The cell from micro-organisms such as bacteria, fungi, filamentous algae, treated in various ways and used as food, are called single cell protein (SCP). The biomass is not only obtained from unicellular microorganisms but also from multicellular microorganisms.

41. **(d)** Meristem is a localized group of cells, which are actively dividing and undifferentiated but ultimately give rise to permanent tissue. Cultivation of axillary or apical shoot meristems is called meristem culture. Meristem culture is carried out in potato, banana, cardamom, orchids (protocorm stage), sugarcane, strawberry, sweet potato, etc.

42. **(b)** The plant cell without cell wall are called protoplasts.

43. **(b)** The above figures of maize, wheat and garden pea are some Indian hybrid crops. The term "hybrid" refers to a plant variety which is developed through the interbreeding of two or more varieties, genera or species. Though hybrids contain the best properties of the parent plants, they usually do not breed true and often revert to one of the parent plants. Hybrids are favoured for greater disease resistance, more vigorous growth, earlier maturity, higher quality of vegetables, better uniformity and improved flavour.

44. **(b)**

45. **(c)** Because iron promotes the formation of chlorophyll and magnesium is an integral part of chlorophyll molecule so in the absence of these nutrients plants show chlorosis & leaves get yellowing. Application of iron and magnesium to promote the synthesis of chlorophyll can cure the disease.