ROLL NUMBER				

SET	A

INDIAN SCHOOL MUSCAT
SAMPLE PAPER
BIOLOGY(044)

CLASS : XII
DATE:

TIME ALLOTED : 3 HRS.
MAXIMUM MARKS:70

GENERAL INSTRUCTIONS:

(i) *All questions are compulsory.*

(ii) *The question paper has five sections and 33 questions. All questions are compulsory.*

(iii) *Section–A has 16 questions of 1 mark each; Section–B has 5 questions of 2 marks each; Section–C has 7 questions of 3 marks each; Section– D has 2 case-based questions of 4 marks each; and Section-E has 3 questions of 5 marks each.*

(iv) *There is no overall choice. However, internal choices have been provided in some questions. A student has to attempt only one of the alternatives in such questions.*

(v) *Wherever necessary, neat and properly labeled diagrams should be drawn.*

1. The coconut water from tender coconut is 1

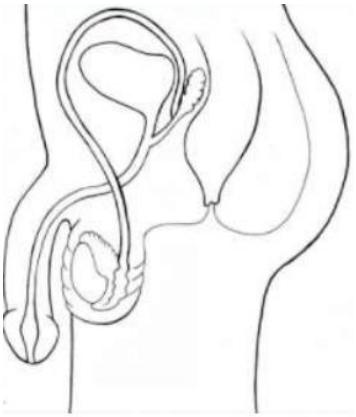
   A. cellular endosperm. B. free nuclear endosperm.

   C. both cellular and nuclear endosperm. D. free nuclear embryo

2. The aquatic plant having long and ribbon like pollen grains is 1

   A. Vallisneria B. Hydrilla C. Eichhornia D. Zostera

3. Shown here is a representation of the male reproductive system. 1



One of its important parts is missing. Which one?

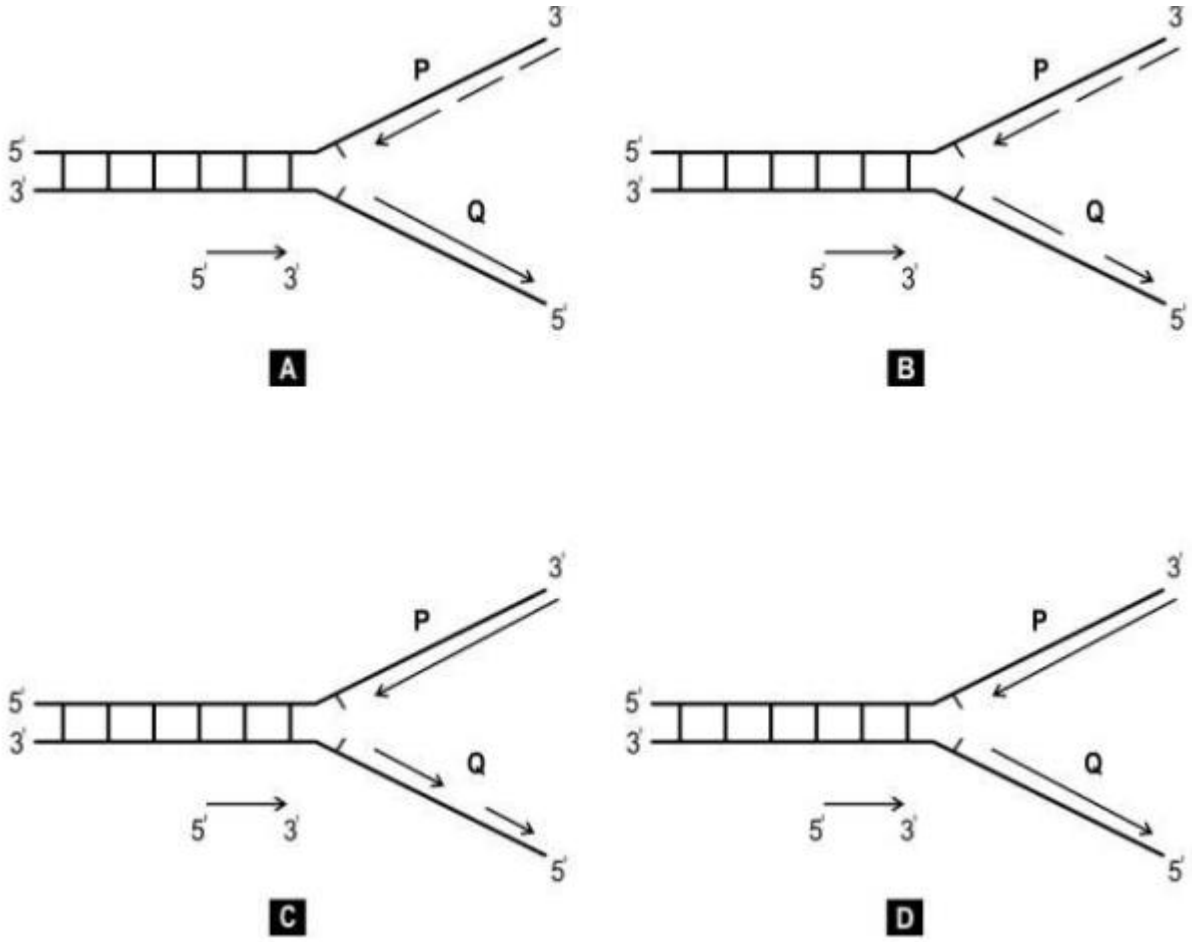
A. urinary bladder B. seminal vesicles C. prostate gland D. vas deferens

4. Which among the following statements about the exons is TRUE? 1

A. They are stop codons. B. They are start codons.

C. They are coding sequences. D. They are intervening sequences.

5. Which one of the images of the replicating fork given below represent the process correctly? 1



6. According to Mendel , the nature of the unit factors that control the expression of the traits were 1

A. stable B. blending

C. discrete D. stable and discrete

7. The number of different types of gametes that would be produced from a parent with the genotype AABBCc is 1

A. 4 B. 3 C. 1 D. 2

8. The microbes commonly used in kitchens are 1

A. *Lactobacillus* and Yeast B. *Penicillium* and Yeast

C. *Microspora* and *E. coli* D. *Rhizopus* and *Lactobacillus*

9. Nematode specific genes were introduced into the tobacco host plant using a vector 1

A. pBR 322 B.Plasmid C. Bacteriophage D. Agrobacterium

10. In DNA recombinant technique, for desired results, the gene of interest is always linked to 1

A. host B. parasite C. vector D. protein

11. In biotechnology experiments, 'molecular scissors' used are 1

A. Plasmid B. Restriction enzymes C. Vectors D. Sigma factor

12. The birth and death rates of four countries are given below. Which one will have the least population growth rate? 1

Country	Birth rate/1000	Death rate/1000
M	15	5
N	25	10
O	35	18
P	48	41

A. M B. N C. P D. O

Question No. 13 to 16 consist of two statements – Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:

A. Both A and R are true and R is the correct explanation of A.
B. Both A and R are true and R is not the correct explanation of A.
C. A is true but R is false.
D. A is False but R is true.

13. Assertion: very often persons suffering from Sexually Transmitted Diseases (STDs) do not go for timely detection and proper treatment. 1

Reason: Absence or less significant symptoms in the early stages of STDs and the social stigma attached to this disease.

14. Assertion: When the two genes in a dihybrid cross are situated on the same chromosome, the proportion of parental gene combinations is much higher than non-parental type. 1

Reason: Higher parental gene combinations can be attributed to crossing over between two genes.

15. Assertion: Insertion of recombinant DNA within the coding sequence of beta-galactosidase results in colourless colonies. 1

Reason: Presence of insert results in inactivation of enzyme beta-galactosidase known as insertional inactivation.

16. Assertion: Ectoparasites line inside the host's body at different sites. 1

Reason: Parasites are host specific and both parasite and host co-evolve.

SECTION – B

17. Name the cell from which the endosperm of coconut develops. Give the characteristics of endosperm of coconut. 2

18. Explain the dual function of AUG codon. Give the sequence of bases it is transcribed from and its anticodon. 2

19. How would the gene flow or genetic drift affect the population in which either of them happen to take place ? 2

OR

Select two pairs from the following which exhibit divergent evolution. Give reasons for your answer.

(i) Forelimbs of cheetah and mammals (ii) Flippers of dolphins and penguins (iii) Wings of butterflies and birds (iv) Forelimbs of whales and mammals

20. Why is *Taq polymerase* preferred in PCR? Mention the source of this enzyme. 2

21. What had happened, when the starfish *Pisaster,* which is in an important predator in American pacific host was removed from there and why? 2

SECTION – C

22. A woman has certain queries as listed below, before starting with contraceptive pills, Answer them: 3

(a) What do contraceptive pills contain and how do they act as contraceptives?

(b) What schedule should be followed for taking these pills?

23. Explain the processes of emasculation and Bagging of flowers. State their importance in breeding experiments. 3

24. The chemical nature of the genetic material was discovered by Avery et al.., Later it was confirmed by Hershey and Chase. Explain the discovery made by Hershey and Chase using radioactive sulphur and phosphorus in their experiment. 3

25. (a) List the two methodologies which were involved in human genome project. Mention how they were used. 3

(b) Expand 'YAC' and mention what it was used for.

26. Name a human disease, its causal organism, symptoms (any three) and vector, spread by intake of water and food contaminated by human faecal- matter. 3

OR

(a) Why is there a fear amongst the guardians that their adolescent wards may get trapped in drug/alcohol abuse?

(b) Explain 'addiction' and 'dependence' in respect of drug/alcohol abuse in youth.

27. Choose any three microbes, from the following which are suited for organic farming which is in great demand these days for various reasons. Mention one application of each one chosen. 3

Mycorrhiza ; ***Monascus*** ; ***Anabaena*** ; ***Rhizobium*** ; ***Methanobacterium*** ; ***Trichoderma.***

28. Secondary treatment of the sewage is also called Biological treatment. Justify this statement and explain the process. 3

SECTION – D

Q.no 29 and 30 are case based questions. Each question has subparts with internal choice in one subpart.

29. The pollen grains or microspores are the male reproductive bodies of a flower and are contained in the pollen sac or microsporangia. Each pollen grain consists of a single microscopic cell, possessing two coats: the exine and the intine. The exine of a pollen grain is made of chemically stable material. Because of this, pollen grains are often very well preserved for thousands of years in soil and sediments. 4

i) When an anther is said to be bilobed and dithecous?

ii) At which stage pollen grain is released from the flower in angiosperms? Name those cells.

iii) Why fossils of pollen grain are available but not ovum?

iv) What is pollen viability?

OR

What is pollen bank?

30. Transgenic animals can serve as factories that in some cases, may produce large amount of proteins more efficiently. Transgenic mice have been engineered to express human antibodies by introducing large segment of human DNA encoding human immunoglobulin genes. In transgenic large animals such as cow or sheep proteins of pharmaceutical value can be produced in large quantities in milk which is later purified. Transgenesis can be used to alter many phenotypic properties including growth rate, fat composition, milk production, hair texture, etc. 4

i) What are transgenic animals?

ii) Name the first transgenic cow.

iii) Which animal is used next to transgenic mouse in vaccine and other pharmaceutical products' testing as trial?

iv) How genes of interest are transferred to animals?

OR

How DNA is isolated from a plant cell?

SECTION – E

31. If a desired gene is identified in an organism for some experiments, explain the process of the following : 5

(i) Cutting this desired gene at specific location

(ii) Synthesis of multiple copies of this desired gene

OR

(i) Describe the characteristics a cloning vector must possess.

(ii) Why DNA cannot pass through the cell membrane? Explain. How is a bacterial cell made 'competent' to take up recombinant DNA from the medium?

32. Under polio prevention programme, infants in India were given polio vaccines on a large scale at regular intervals to eradicate polio from the country. 5

(a) What is a vaccine? Explain how it imparts immunity to the child against the disease.

(b) With the help of an example each, differentiate between active and passive immunity.

OR

What are bio fertilizers? Describe their role in agriculture. Why are they preferred to chemical fertilizers?

33. Describe Frederick Griffith's experiment on Streptococcus pneumoniae. Discuss the conclusion he arrived at. 5

OR

What is the inheritance pattern observed in the size of starch grains and seed shape of *Pisum sativum* ? Workout themonohybrid cross showing the above traits. How does this pattern of inheritance deviate from that of Mendelian law of dominance ?

******END OF THE QUESTION PAPER******

ROLL NUMBER					

SET	B

INDIAN SCHOOL MUSCAT
SAMPLE PAPER
BIOLOGY(044)

CLASS : XII TIME ALLOTED : 3 HRS.

DATE: MAXIMUM MARKS:70

GENERAL INSTRUCTIONS:

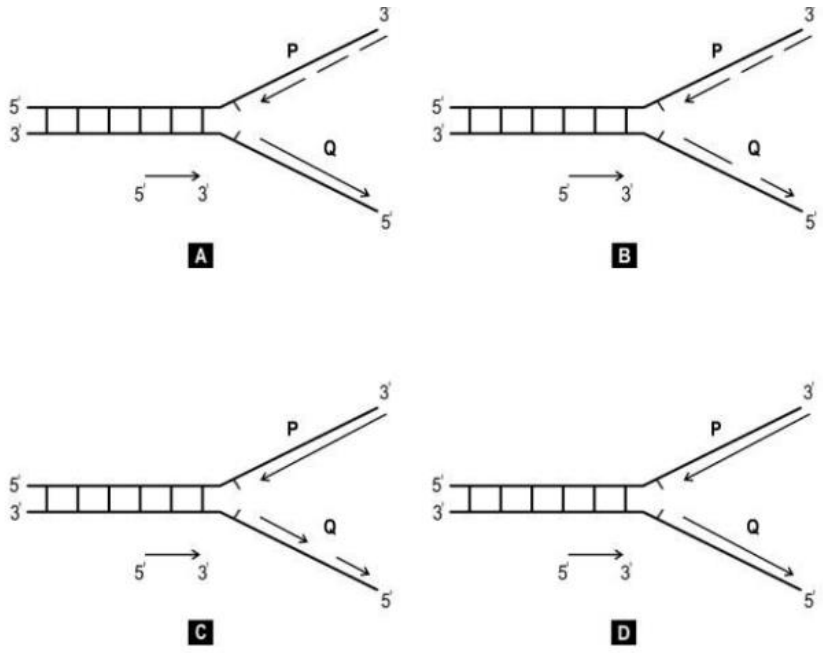
(i) *All questions are compulsory.*

(ii) *The question paper has five sections and 33 questions. All questions are compulsory.*

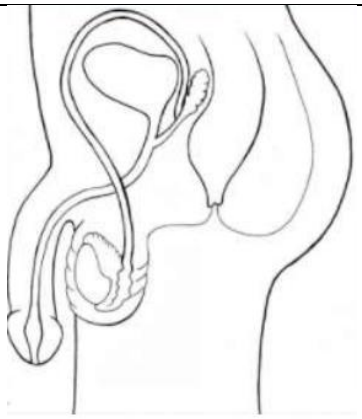
(iii) *Section–A has 16 questions of 1 mark each; Section–B has 5 questions of 2 marks each; Section–C has 7 questions of 3 marks each; Section– D has 2 case-based questions of 4 marks each; and Section-E has 3 questions of 5 marks each.*

(iv) *There is no overall choice. However, internal choices have been provided in some questions. A student has to attempt only one of the alternatives in such questions.*

(v) *Wherever necessary, neat and properly labeled diagrams should be drawn.*

1.	Which one of the images of the replicating fork given below represent the process correctly? 	1

2.	Which among the following statements about the exons is TRUE? A. They are stop codons. B. They are start codons. C. They are coding sequences. D. They are intervening sequences.	1
3.	The number of different types of gametes that would be produced from a parent with the genotype AABBCc is A. 4 B. 3 C. 1 D. 2	1
4.	The microbes commonly used in kitchens are A. *Lactobacillus* and Yeast B. *Penicillium* and Yeast C. *Microspora* and *E. coli* D. *Rhizopus* and *Lactobacillus*	1
5.	The coconut water from tender coconut is A. cellular endosperm. B. free nuclear endosperm. C. both cellular and nuclear endosperm. D. free nuclear embryo	1
6.	The birth and death rates of four countries are given below. Which one will have the least population growth rate? Country / Birth rate/1000 / Death rate/1000 M / 15 / 5 N / 25 / 10 O / 35 / 18 P / 48 / 41 A. M B. N C. P D. O	1
7.	The aquatic plant having long and ribbon like pollen grains is A. Vallisneria B. Hydrilla C. Eichhornia D. Zostera	1
8.	Shown here is a representation of the male reproductive system.	1

	 One of its important parts is missing. Which one? A. urinary bladder B. seminal vesicles C. prostate gland D. vas deferens	
9.	Nematode specific genes were introduced into the tobacco host plant using a vector A. pBR 322 B.Plasmid C. Bacteriophage D. Agrobacterium	1
10.	In DNA recombinant technique, for desired results, the gene of interest is always linked to A. host B. parasite C. vector D. protein	1
11.	In biotechnology experiments, 'molecular scissors' used are A. Plasmid B. Restriction enzymes C. Vectors D. Sigma factor	1
12.	According to Mendel , the nature of the unit factors that control the expression of the traits were A. stable B. blending C. discrete D. stable and discrete	1
Question No. 13 to 16 consist of two statements – Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below: A. Both A and R are true and R is the correct explanation of A. B. Both A and R are true and R is not the correct explanation of A. C. A is true but R is false. D. A is False but R is true.		
13.	Assertion: When the two genes in a dihybrid cross are situated on the same chromosome, the proportion of parental gene combinations is much higher than non-parental type. Reason: Higher parental gene combinations can be attributed to crossing over between two genes.	1
14.	Assertion: Insertion of recombinant DNA within the coding sequence of beta-galactosidase results in colourless colonies. Reason: Presence of insert results in inactivation of enzyme beta-galactosidase known as insertional inactivation.	1
15.	Assertion: Ectoparasites line inside the host's body at different sites. Reason: Parasites are host specific and both parasite and host co-evolve.	1

16.	Assertion: very often persons suffering from Sexually Transmitted Diseases (STDs) do not go for timely detection and proper treatment. Reason: Absence or less significant symptoms in the early stages of STDs and the social stigma attached to this disease.	1
	SECTION – B	
17.	Gynoecium of a flower may be apocarpous or syncarpous. Explain with the help of an example each.	2
18.	What does central dogma state in molecular biology? How does it differ in some viruses? .	2
19.	How would the gene flow or genetic drift affect the population in which either of them happen to take place ? OR Select two pairs from the following which exhibit divergent evolution. Give reasons for your answer. (i) Forelimbs of cheetah and mammals (ii) Flippers of dolphins and penguins (iii) Wings of butterflies and birds (iv) Forelimbs of whales and mammals	2
20.	Why is *Taq polymerase* preferred in PCR? Mention the source of this enzyme.	2
21.	What had happened, when the starfish *Pisaster,* which is in an important predator in American pacific host was removed from there and why?	2
	SECTION – C	
22.	(a) Name of two copper releasing IUDs. (b) Explain how they act as effective contraceptives in human females.	3
23.	A non-biology person is quite shocked to know that apple is a false fruit, mango is a true fruit and banana is a seedless fruit. As a biology student how would you satisfy this person?	3
24.	The chemical nature of the genetic material was discovered by Avery et al.., Later it was confirmed by Hershey and Chase. Explain the discovery made by Hershey and Chase using radioactive sulphur and phosphorus in their experiment.	3
25.	(a) Expand VNTR and describe its role in DNA fingerprinting. (b) List any two applications of DNA fingerprinting technique.	3
26.	Name a human disease, its causal organism, symptoms (any three) and vector, spread by intake of water and food contaminated by human faecal- matter. OR (a) Why is there a fear amongst the guardians that their adolescent wards may get trapped in drug/alcohol abuse?	3

	(b) Explain 'addiction' and 'dependence' in respect of drug/alcohol abuse in youth.	
27.	Choose any three microbes, from the following which are suited for organic farming which is in great demand these days for various reasons. Mention one application of each one chosen. ***Mycorrhiza*** ; ***Monascus*** ; ***Anabaena*** ; ***Rhizobium*** ; ***Methanobacterium*** ; ***Trichoderma.***	3
28.	Secondary treatment of the sewage is also called Biological treatment. Justify this statement and explain the process.	3
	SECTION – D Q.no 29 and 30 are case based questions. Each question has subparts with internal choice in one subpart.	
29.	Transgenic animals can serve as factories that in some cases, may produce large amount of proteins more efficiently. Transgenic mice have been engineered to express human antibodies by introducing large segment of human DNA encoding human immunoglobulin genes. In transgenic large animals such as cow or sheep proteins of pharmaceutical value can be produced in large quantities in milk which is later purified. Transgenesis can be used to alter many phenotypic properties including growth rate, fat composition, milk production, hair texture, etc. i) What are transgenic animals? ii) Name the first transgenic cow. iii) Which animal is used next to transgenic mouse in vaccine and other pharmaceutical products' testing as trial? iv) How genes of interest are transferred to animals? OR How DNA is isolated from a plant cell?	4
30.	The pollen grains or microspores are the male reproductive bodies of a flower and are contained in the pollen sac or microsporangia. Each pollen grain consists of a single microscopic cell, possessing two coats: the exine and the intine. The exine of a pollen grain is made of chemically stable material. Because of this, pollen grains are often very well preserved for thousands of years in soil and sediments. i) When an anther is said to be bilobed and dithecous? ii) At which stage pollen grain is released from the flower in angiosperms? Name those cells. iii) Why fossils of pollen grain are available but not ovum? iv) What is pollen viability? OR What is pollen bank?	4

	SECTION – E	
31.	If a desired gene is identified in an organism for some experiments, explain the process of the following : (i) Cutting this desired gene at specific location (ii) Synthesis of multiple copies of this desired gene OR (i) Describe the characteristics a cloning vector must possess. (ii) Why DNA cannot pass through the cell membrane? Explain. How is a bacterial cell made 'competent' to take up recombinant DNA from the medium?	5
32.	Describe Frederick Griffith's experiment on Streptococcus pneumoniae. Discuss the conclusion he arrived at. OR What is the inheritance pattern observed in the size of starch grains and seed shape of *Pisum sativum* ? Workout themonohybrid cross showing the above traits. How does this pattern of inheritance deviate from that of Mendelian law of dominance ?	5
33.	(a) Name the category of microbes occurring naturally in sewage and making it less polluted during the treatment. (b) Explain the different steps involved in the secondary treatment of sewage. OR (a) Name and explain any four lymphoid organs present in humans. (b) Categorise the named Lymphoid organs as primary or secondary lymphoid organs , giving reasons.	5
	******END OF THE QUESTION PAPER******	

ROLL NUMBER					

SET	C

INDIAN SCHOOL MUSCAT
SAMPLE PAPER
BIOLOGY(044)

CLASS : XII TIME ALLOTED : 3 HRS.

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1.	According to Mendel , the nature of the unit factors that control the expression of the traits were A. stable B. blending C. discrete D. stable and discrete	1
2.	In biotechnology experiments, 'molecular scissors' used are A. Plasmid B. Restriction enzymes C. Vectors D. Sigma factor	1
3.	In DNA recombinant technique, for desired results, the gene of interest is always linked to A. host B. parasite C. vector D. protein	1
4.	Nematode specific genes were introduced into the tobacco host plant using a vector A. pBR 322 B.Plasmid C. Bacteriophage D. Agrobacterium	1
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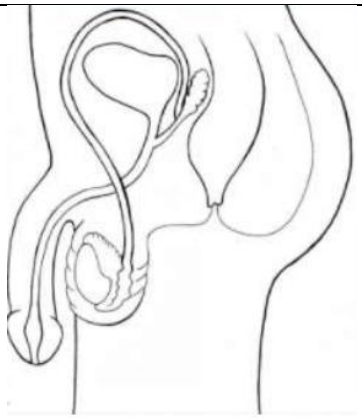

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6. The aquatic plant having long and ribbon like pollen grains is (1)

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A. *Lactobacillus* and Yeast B. *Penicillium* and Yeast

C. *Microspora* and *E. coli* D. *Rhizopus* and *Lactobacillus*

10. The number of different types of gametes that would be produced from a parent with the genotype AABBCc is (1)

A. 4 B. 3 C. 1 D. 2

11. Which among the following statements about the exons is TRUE? (1)

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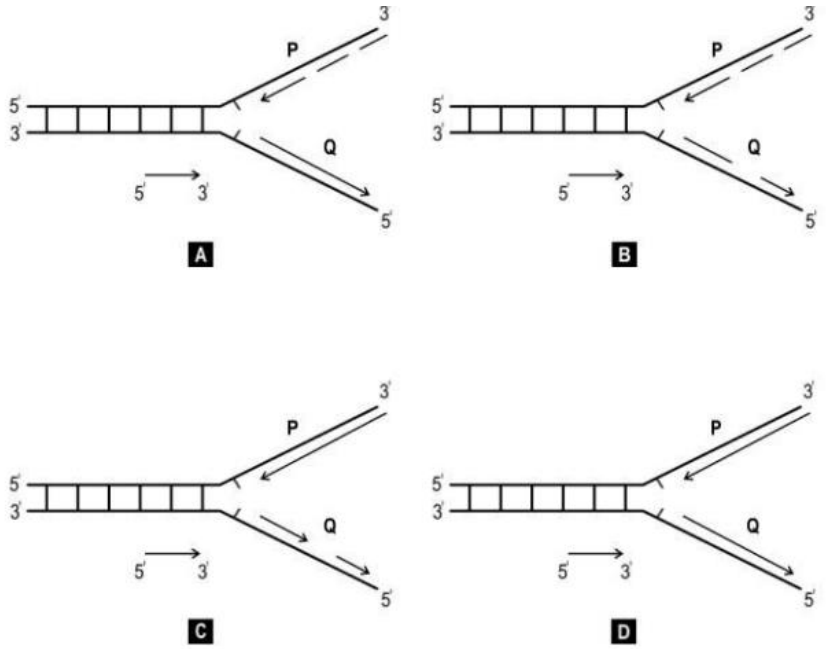
12.	Which one of the images of the replicating fork given below represent the process correctly?  	1

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	Reason: Higher parental gene combinations can be attributed to crossing over between two genes.	
	SECTION – B	
17.	Although a prokaryotic cell has no defined nucleus, yet DNA is not scattered throughout the cell. Explain.	2
18.	How would the gene flow or genetic drift affect the population in which either of them happen to take place ? OR Select two pairs from the following which exhibit divergent evolution. Give reasons for your answer. (i) Forelimbs of cheetah and mammals (ii) Flippers of dolphins and penguins (iii) Wings of butterflies and birds (iv) Forelimbs of whales and mammals	2
19.	State one advantage and one disadvantage of cleistogamy.	2
20.	What had happened, when the starfish *Pisaster,* which is in an important predator in American pacific host was removed from there and why?	2
21.	Why is *Taq polymerase* preferred in PCR? Mention the source of this enzyme.	2
	SECTION – C	
22.	Choose any three microbes, from the following which are suited for organic farming which is in great demand these days for various reasons. Mention one application of each one chosen. ***Mycorrhiza*** ; ***Monascus*** ; ***Anabaena*** ; ***Rhizobium*** ; ***Methanobacterium*** ; ***Trichoderma.***	3
23.	Describe the development of a 7-celled female gametophyte from a megaspore mother cell in an angiosperm.	3
24.	Following the collision of two trains a large number of passengers are killed. A majority of them are beyond recognition. Authorities want to hand over the dead to their relatives. Name a modern scientific method and write the procedure that would help in the identification of kinship.	3
25.	If implementation of better techniques and new strategies are required to provide more efficient care and assistance to people, then why is there a statutory ban on amniocentesis? Write the use of this technique and give reason to justify.	3
26.	Name a human disease, its causal organism, symptoms (any three) and vector, spread by intake of water and food contaminated by human faecal- matter. OR (a) Why is there a fear amongst the guardians that their adolescent wards may get trapped in drug/alcohol abuse?	3

	(b) Explain 'addiction' and 'dependence' in respect of drug/alcohol abuse in youth.	
27.	Secondary treatment of the sewage is also called Biological treatment. Justify this statement and explain the process.	3
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	SECTION – E	
31.	If a desired gene is identified in an organism for some experiments, explain the process of the following : (i) Cutting this desired gene at specific location (ii) Synthesis of multiple copies of this desired gene OR (i) Describe the characteristics a cloning vector must possess. (ii) Why DNA cannot pass through the cell membrane? Explain. How is a bacterial cell made 'competent' to take up recombinant DNA from the medium?	5
32.	A tall pea plant with yellow seeds (heterozygous for both the traits) is crossed with a dwarf pea plant with green seeds. Using a Punnett square work out the cross to show the phenotypes and the genotypes of F1 generation. OR What is 'semi-conservative' DNA replication? How was it experimentally proved and by whom?	5
33.	(a) Name the category of microbes occurring naturally in sewage and making it less polluted during the treatment. (b) Explain the different steps involved in the secondary treatment of sewage. OR (a) Name and explain any four lymphoid organs present in humans. (b) Categorise the named Lymphoid organs as primary or secondary lymphoid organs , giving reasons.	5
	******END OF THE QUESTION PAPER******	