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CREATING AND SETTING EXAMPLES FOR FUTURE...

CLASS XII : SAMPLE QUESTION PAPER - 1
SUBJECT: BIOLOGY (044)

Time Allowed: 3 Hours **Maximum Marks: 70**

General instructions:

1. All questions are compulsory.
2. The question paper has five sections and 33 questions.
3. Section–A has 16 questions of 1 mark each.
4. Section–B has 5 questions of 2 marks each.
5. Section– C has 7 questions of 3 marks each.
6. Section– D has 2 case-based questions of 4 marks each.
7. Section–E has 3 questions of 5 marks each.
8. 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.
9. Wherever necessary, neat and properly labeled diagrams should be drawn.

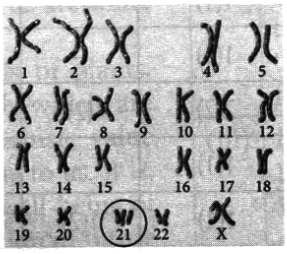
SECTION — A

Q. No. 1 to 12 are multiple choice questions. Only one of the choices is correct. Select and write the correct choice as well as the answer to these questions.

1. Which of the following statements about sporopollenin is incorrect?
(a) Exine is made up of sporopollenin.
(b) Sporopollenin is one of the resistant organic materials.
(c) Exine has apertures called germ pores where sporopollenin is present.
(d) Sporopollenin can withstand high temperatures and strong acids.

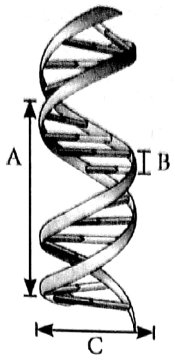
2. 2n = 16 is in a primary spermatocyte which is in metaphase of first meiotic division. What shall be the total number of chromatids in each of the secondary spermatocyte?
(a) 16 (b) 24 (c) 32 (d) 8

3. Refer to the given figure representing karyotype of individual who inflicted with this chromosomal disorder.



Select the correct statement(s) regarding it.
(a) This disorder occurs due to failure of segregation of chromatids during cell division cycle resulting in the gain of chromosome.
(b) This disorder occurs due to failure of cytokinesis after telophase stage of cell division resulting in an increase in whole set of chromosome.
(c) Individuals inflicted with this disorder are usually sterile.
(d) Both (a) and (c)

4. Given figure represents the DNA double helix model as proposed by Watson and Crick (1953). Select the option that shows correct measurements of A, B and C.



(a) A–3.4 nm, B–0.34 nm, C–2 nm
(b) A–34 nm, B–3.4 nm, C–20 nm
(c) A–3.4 Å, B–0.34 Å, C–20 Å
(d) A–34 Å, B–3.4 Å, C–2 Å

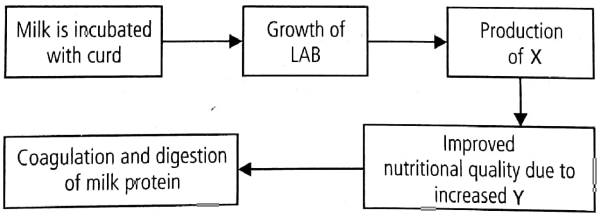
5. Tobacco consumption is known to stimulate secretion of adrenaline and nor-adrenaline. The component causing this could be
(a) nicotine (b) tannic acid (c) curaimin (d) catechin.

6. Match column I with column II and select the correct option from the given codes.

	Column I		**Column II**
A.	Sporozoites	(i)	Infectious form of *Plasmodium*
B.	Filariasis	(ii)	Tumour cells
C.	AIDS	(iii)	*Wuchereria*
D.	Neo-plastic	(iv)	ELISA

(a) A-(iv), B-(ii), C-(i), D-(iii)
(b) A-(iii), B-(iv), C-(ii), D-(i)
(c) A-(ii), B-(iii), C-(i), D-(iv)
(d) A-(i), B-(iii), C-(iv), D-(ii)

7. Study the following flow chart depicting the formation of curd from milk. Identify the missing parts X and Y.



(a) X-Gluconic acid, Y-Vitamin B_1
(b) X-Lactic acid, Y-Vitamin B_2
(c) X-Lactic acid, Y-Vitamin B_{12}
(d) X-Citric acid, Y-Vitamin C

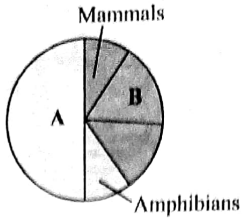
8. Select the correct match.

	Gene	**Target insect**
A.	*cry*I Ac	Cotton bollworm
B.	*cry*II Ab	Corn borer
C.	*cry*I Ab	Cotton bollworm

(a) A only (b) A and C only (c) B and C only (d) A, B and C

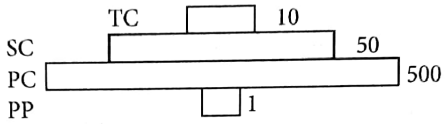
9. There are four major causes of accelerated rates of species extinction, which are collectively called 'the Evil Quartet'. Which one of the following is not included in 'the evil quartet'?
(a) Over exploitation
(b) Pollution
(c) Co-extinctions
(d) Alien species invasions

10. The given pie chart represents the proportionate number of species of major taxa of vertebrates. Identify the groups A and B.



(a) A – Reptiles, B – Birds
(b) A – Fishes, B – Birds
(c) A – Birds, B – Fishes
(d) A – Birds, B – Reptiles

11. Given below is an imaginary pyramid of numbers. What could be one of the possibilities about certain organisms at some of the different levels ?



(a) Level PC is "insects" and level SC is "small insectivorous birds".
(b) Level PP is "phytoplanktons" in sea and "whale" on top level TC.
(c) Level one PP is "*pipal* trees" and the level SC is "sheep".
(d) Level PC is "rats" and level SC is "cats".

12. Which type of association is found in between entomophilous flower and pollinating agent?
(a) Amensalism
(b) Commensalism
(c) Parasitism
(d) Co-extinction

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 (A) :** Spermicidal creams, jellies and foams are usually used alongwith intra-uterine devices to increase their contraceptive efficiency.
Reason (R) : Intrauterine devices (IUDs) are effective and widely used contraceptives.

14. **Assertion (A) :** Darwin's finches have different types of modified beaks according to their feeding habits.
Reason (R) : Convergent evolution leads to development of structures with different function arising from a common ancestor.

15. **Assertion (A) :** *Eco*RI cuts the DNA bases G and A when the sequence in DNA will be GAATTC.
Reason (R) : *Eco*RI produces sticky ends.

16. **Assertion (A) :** In National parks, cultivation of land and grazing is not permitted.
Reason (R) : National park is meant for protection of both flora and fauna.

SECTION - B

17. Highlight the effect of the high concentration of LH on mature Graafian follicle.

OR

Mention the secreted hormone by following stage.

S.N.	Stage of menstrual cycle	Hormone
(i)	Graafian follicle	(a)
(ii)	Corpus Luteum	(b)

18. Explain why it is scientifically incorrect to blame the mother for bearing female child.

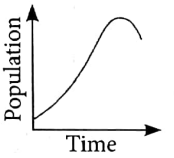
19. Name the causative organism, two symptoms and mode of transmission of amoebiasis.

OR

(a) Explain the property that prevents normal cells from becoming cancerous.
(b) All normal cells have inherent characteristic of becoming cancerous. Explain

20. Give reasons for the following:
(a) Proteases are added during isolation of DNA for genetic engineering.
(b) Single cloning site is preferred in a vector.

21. The algal bloom in a pond exhibited the following growth pattern.



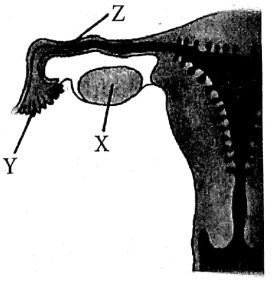
Identify this pattern of population growth and give reason for the abrupt decline in the population.

OR

Can the amount of available energy in any trophic level larger than the available energy in inferior trophic levels? What does that condition means to the conformation of the energy pyramids?

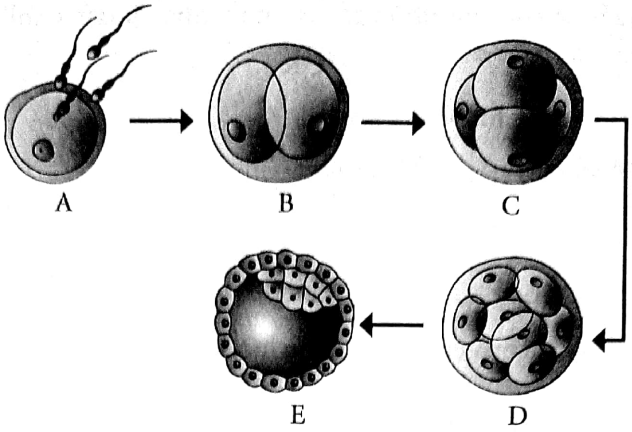
SECTION - C

22. Refer to the given diagram showing a part of the human female reproductive system.



(a) Name the gamete cells that would be present in 'X' if taken from a newborn baby.
(b) Name 'Y' and write its function.
(c) Name 'Z' and write the events that take place here.

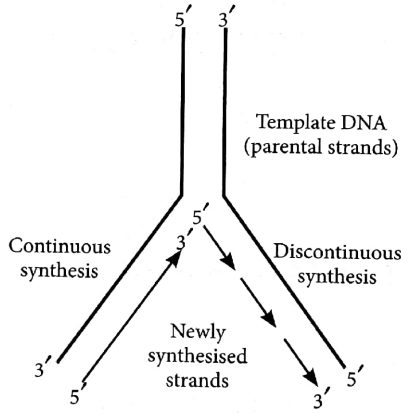
23. The diagram below represents the development of a human zygote from fertilisation to the early blastocyst stage.



From the figure, identify at which stage IUT is done and explain it.

24. A burglar in a huff forgot to wipe off his blood-stains from the place of crime where he was involved in a theft and fight. Name the technique which can help in identifying the burglar from the blood-stains. Describe the technique.

25. In *E.coli*, the main enzyme DNA dependent DNA polymerase catalyse polymerisation only in one direction. These enzymes are highly effective enzymes as they have to catalyse polymerisation of a large number of nucleotides in a very short time.



(a) Identify the structure shown above.
(b) Mention the difference in the synthesis based on the polarity of the two template strands.

26. Carefully observe the given structure and answer questions that follow :

(a) Name the compound obtained from given plant.
(b) What is the chemical nature of the compound obtained from this plant?
(c) What are the major effects of the compound obtained from the given plant?

27. X and Y are the two different cloning vectors in two different bacterial colonies cultured in chromogenic substrate. Bacterial colonies with cloning vector X were colourless whereas those with Y were blue coloured. Explain giving reasons the cause of the difference in colour that appeared.

28. Plot a logistic growth curve. Describe nature's carrying capacity for a species in a particular habitat.

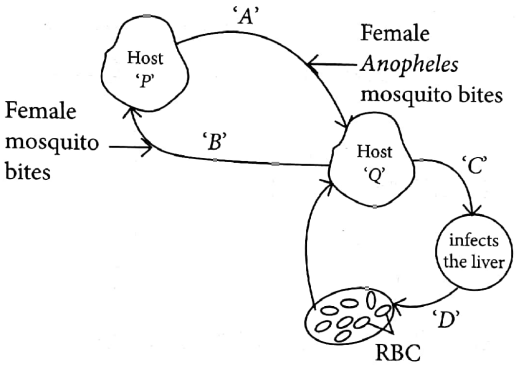
SECTION - D

29. Genes that are found on sex chromosomes are called sex-linked genes. These genes can be either on X chromosome or Y chromosome. If a gene is located on the Y chromosome, it is a Y linked gene. These genes are only inherited by males because, in most instances, males have a genotype of (XY). Genes that are found on the X chromosome are called X-linked genes. These genes can be inherited by both males and females.
(a) Name any two sex-linked human diseases.

OR

X-linked diseases show diagynic inheritance. Justify.
(b) Why males suffer more from sex-linked disorders than females?
(c) How Y-linked inheritance is different from X-linked inheritance?

30. Refer to the given figure showing the life cycle of a pathogenic protozoan. This pathogenic protozoan requires two hosts; P and Q.



(a) Write the changes the parasite undergoes in the liver.
(b) Write the changes the parasite undergoes when it enters the RBC.
(c) Trace the changes the parasite undergoes when the host '*P*' takes its blood meal from infected host '*Q*'.

OR

Name the parasitic stage that is being transferred from host '*P*' to host '*Q*'.

SECTION - E

31. 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 the ban. Name any four disorders that can be detected by this technique.

OR

A group of scientists conducted an experiment wherein they tabulated the characteristics of pollen grains of plant species X, Y and Z

Plant	Pollen characteristics
X	light and winged
Y	thread-like without exine
Z	spiny, heavy and surrounded by pollen kit

What can be inferred about pollinating agents of these plants? How are flowers of plant X different from that of plant Z? Name one plant that can be placed at Y.

32. Now, sequencing of total genome is getting less expensive day by the day. Soon it may be affordable for a common man to get his genome sequenced. What in your opinion could be the advantage and disadvantage of this development?

OR

(a) "Haemophilia is generally observed in human males". Justify this statement. Explain the possible cases under which a human female can be haemophilic.

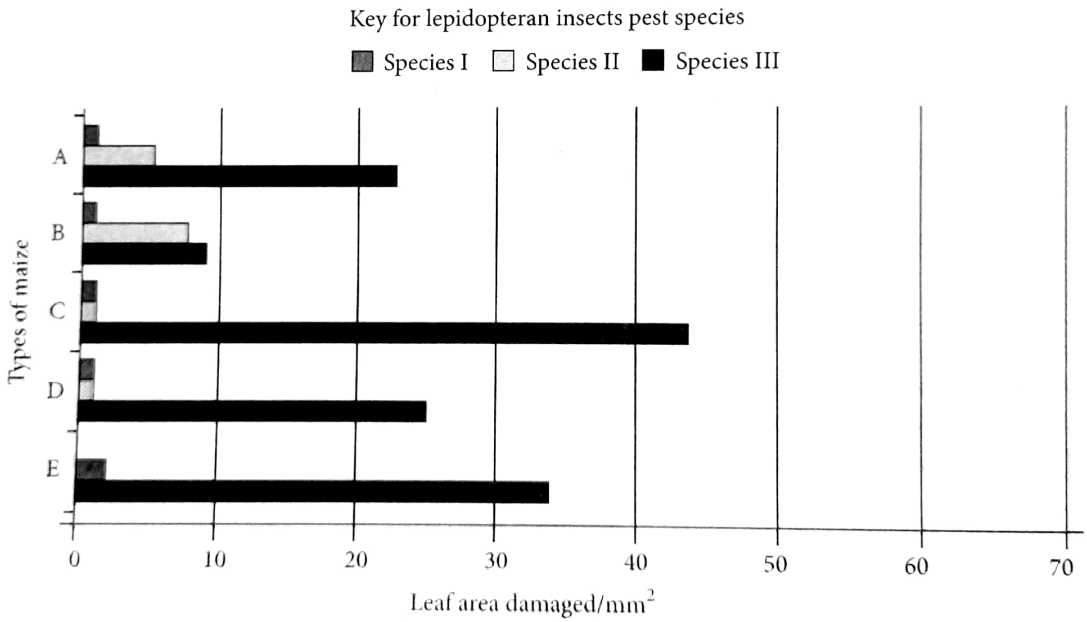
(b) A pregnant human female was advised to undergo MTP It was diagnosed by her doctor that the fetus she is carrying has developed from a zygote formed by an XX-egg fertilised by Y-carrying sperm. Why was she advised to undergo MTP?

33. Insects in the Lepidopteran group lay eggs on maize crops. The larvae on hatching feed on maize leaf and tender cob. In order to arrest the spread of three such Lepidopteran pests, Bt maize crops were introduced in an experimental field.

A study was carried out to see which of the three species of lepidopteran pests was most susceptible to Bt genes and its product.

The lepidopteran pests were allowed to feed on the same Bt-maize crops grown on 5 fields (A-E).

The graph below shows the leaf area damaged by these three pests after feeding on maize leaves for five days.



Insect gut pH was recorded as 10, 8 and 6 respectively for Species I, II and III respectively.

(a) Evaluate the efficacy of the Bt crop on the feeding habits of the three species of stem borer and suggest which species is least susceptible to Bt toxin.

(b) Which species is most susceptible to Bt-maize? Explain why?

(c) Using the given information, suggest why similar effect was not seen in the three insect species?

OR

Unless the vector and source DNA are cut, fragments separated and joined, the desired recombinant vector molecule cannot be created.

(a) How are the desirable DNA sequences cut?

(b) Explain the technique used to separate the cut fragments.

(c) How are the resultant fragments joined to the vector DNA molecule?