

(General Instructions)

- ❖ Please check that this question paper contains 8 printed pages.
- ❖ Please check that this question paper contains 33 questions.
- ❖ Please write down the serial number of the question before attempting it.
- ❖ Reading time of 15 minutes is given to read the question paper alone. No writing during this time.
- ❖ All questions are compulsory.
- ❖ The question paper has five sections: Section A, Section B, Section C, Section D and Section E. There are 33 questions in the question paper.
- ❖ Section-A has 12 questions of MCQ and 04 Assertion & Reason questions of each 1 mark. Section-B has 5 questions of 2 marks each. Section-C has 7 questions of 3 marks each and Section-D has 2 questions of 4 marks each, Section-E has 3 questions of 5 marks each.
- ❖ 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.
- ❖ Wherever necessary, neat and properly labelled diagrams should be drawn.

COMMON EXAMINATION

Class-12

(BIOLOGY- 044/2)

Roll No.:

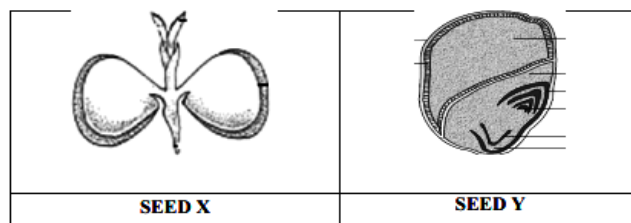
Maximum Marks: 70

Date:

Time allowed: 3 hours

SECTION – A

1. Which is the correct surgical procedure as a contraceptive method in male (1)
 - (a) Ovariectomy (b) Hysterectomy (c) Vasectomy (d) Tubectomy.
2. Arrange the following events in the order of synthesis of a protein (1)
 - i) A peptide bond forms
 - ii) A tRNA matches its anticodon to the codon in the A- site
 - iii) The movement of second tRNA complex from A-site to P-site
 - iv) The large subunit attaches to the small subunit and the initiator tRNA fits in the P- site
 - v) A small subunit binds to the mRNA
 - vi) The activated amino acid tRNA complex attaches the initiation codon on mRNA
 - a) iv, v, iii, ii, i, vi
 - b) iv, vi, v, ii, I, iii
 - c) v, iv, iii, ii, vi, I
 - d) v, vi, iv, ii, i, iii
3. Which of the following statements are true related to seed X and Y. (1)



- (i) Seed X is dicot and endospermic or albuminous.
- (ii) Seed X is dicot and non- endospermic or non-albuminous
- (iii) Seed Y is monocot and endospermic or non-albuminous
- (iv) Seed Y is monocot and non-endospermic or non-albuminous



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Choose the correct option with the respect to the nature of the seed

- A. (i), (iii)
- B. (ii), (iii)
- C. (i), (iv)
- D. (ii), (iv)

4. How many meiotic divisions are necessary for the formation of 100 grains of wheat? (1)
(a) 100 (b) 125 (c) 25 (d) 50
5. Why more males suffer from haemophilia than females? (1)
(a) Because males have single copy of X which can undergo mutation
(b) Because males have single copy of Y which can undergo mutation
(c) Because males have defective autosomes
(d) Because males have normal autosomes
6. Arrange in decreasing order according to their gestation period (1)
(a) Cat, dog, cow, horse and Elephant
(b) Elephant, horse, cow, dog and cat
(c) Cow horse, cat, dog and Elephant
(d) Elephant, cow, horse, cat and dog
7. Cell mediated immunity is carried out by
(a) B- Lymphocyte
(b) Thrombocyte
(c) T- Lymphocyte
(d) Erythrocyte
8. While isolating DNA from plant which of the following enzyme is not required
a) Cellulase b) Ribonuclease c) Deoxyribonuclease d) Protease
9. Which of the following is most appropriately defined? (1)
a) Commensalism is a relationship in which one species is benefitted and the other is neither benefitted nor harmed
b) Parasite is an organism which always lives inside the body of another organism and may kill it
c) Competition is defined as a process in which the fitness of one species is significantly higher in the presence of another species
d) Mutualism is a relationship in which one species is benefitted whereas the other is unaffected
10. Which is the common nitrogen fixer in paddy fields? (1)
(a) Azospirillum (b) Rhizobium (c) Oscillatoria (d) Frankia
11. Match the items in Column I with those in Column II. (1)

	Column I		Column II
A.	Rosie	1.	Polio vaccine safety
B.	Ti plasmid	2.	Human alphasalalbumin
C.	RNAi	3.	Agrobacterium tumefaciens
D.	Transgenic mice	4.	Meloidogyne incognita

- (a) A-3 B-2 C-1 D-4 (b) A-1 B-3 C-4 D-2
(c) A-2 B-3 C-4 D-1 (d) A-3 B-2 C-4 D-1

12. Nematode specific genes were introduced into the tobacco host plant using a vector. (1)
a) pBR322 b) plasmid c) bacteriophage d) Agrobacterium

In the following questions a statement of assertion followed by a statement of reason.

Choose the correct answer out of the following choices:

- (a) Assertion and reason both are correct statements and reason is correct explanation for assertion.
(b) Assertion and reason both are correct statements but reason is not correct explanation for assertion.
(c) Assertion is correct statement but reason is wrong statement.
(d) Assertion is wrong statement but reason is correct statement.
13. **Assertion (A):** Streptococcus pneumoniae and Haemophilus influenzae are responsible (1)
for causing infectious diseases in human beings.
Reason: (R): A healthy person acquires the infection by inhaling the droplets/aerosols released by an infected person.
14. **Assertion (A):** Lactational amenorrhea is a natural method of contraception. (1)
Reason: (R): Ovulation does not take place during the period of intense lactation following child birth.
15. **Assertion (A):** Pyramid of energy is always upright (1)
Reason: (R): When energy flows from a particular trophic level to the next trophic level, some energy is always lost as heat at each step.
16. **Assertion (A):** To cure ADA deficiency, erythrocytes from the blood of the patient are (1)
grown in a culture outside the body.
Reason: (R): A functional ADA cDNA (using a retroviral vector) is then introduced into these lymphocytes, which are subsequently returned to the patient.

SECTION – B

17. Observe the diagram and label “A” and “B” as well as write two specific features of “B”. (2)



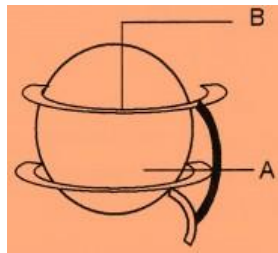
(or)

What are apomictic seeds? Why do farmers prefer apomictic seeds.

18. Many cells and organs work together to protect the body. When the body senses foreign (2)
substances (called antigens), the immune system works to recognize the antigens and get rid of them. Humans have various types of immunity — innate, acquired active, and passive. Identify the type of immunity in the following cases as passive or active immunity.

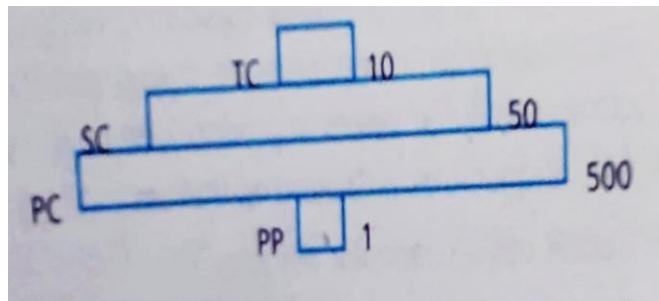
i.	A person is given antibodies to a disease rather than producing them through his immune system.
ii.	Exposure to a pathogen triggers the immune system to produce antibodies
iii	Anti-tetanus injection
iv	Colostrum antibodies present in mothers' milk

19. Exonuclease cannot be used while producing recombinant DNA – Give reason. (2)
20. Answer the questions based on the diagram given below (2)



- i) What does the diagram represent?
- ii) Mention its significance.
- iii) Label A
21. The Food Pyramid is a visual representation of how different foods and drinks contribute towards a healthy balanced diet. The Food Pyramid allows individuals the flexibility to choose foods and drinks from each shelf depending on their food preferences. (2)

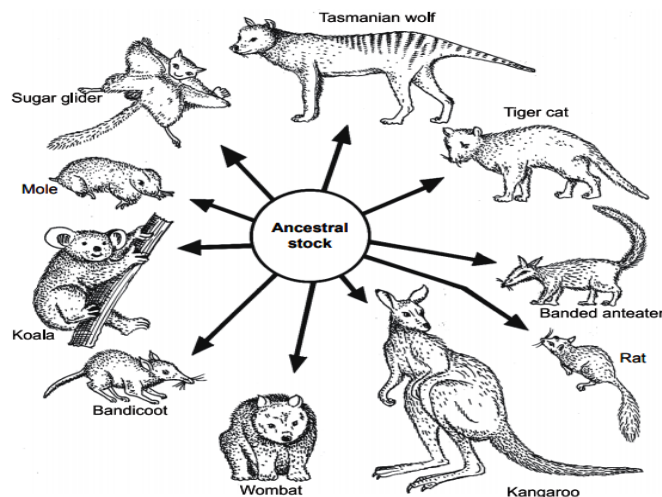
Consider the above diagram and write the answers



- i) What do you understand by TC 10?
- ii) Give one example of PP and SC in this food pyramid.

SECTION – C

22. (a) Name and explain the evolutionary concept represented in the illustration given below: (3)



- (b) Name the type of evolution if more than one adaptive radiation occurred in an isolated geographical area.

(OR)

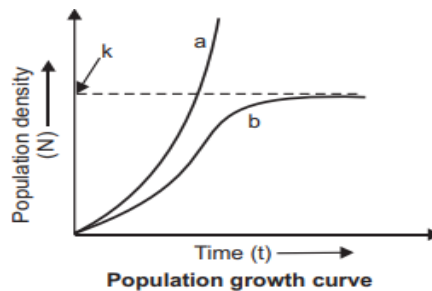
- (a) How does the Hardy-Weinberg's expression ($P^2 + 2pq + q^2 = 1$) explain that genetic equilibrium is maintained in a population?
- (b) List any two factors that can disturb the genetic equilibrium.

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23. State the medicinal value and the bioactive molecules produced by streptococcus, Monascus and Trichoderma. (3)
24. Identify 'a', 'b', 'c', 'd', 'e' and 'f' in the table given below. (3)

S.No	Syndrome	Cause	Characteristics of affected individuals	Sex Male/ Female/Both
1.	Down's	Trisomy of 21	(i) short stature (ii) 'a'	'b'
2.	'c'	XXY	Overall masculine development	'd'
3.	Turner's	45 with XO	(i) Sterile ovaries (ii) 'e'	'f'

25. (a) How is the cell made competent to receive DNA by chemical method? (3)
 (b) What is meant by disarming pathogen method of introducing foreign gene?
 (c) Write the name of the enzymes that are used for isolation of DNA from bacterial and fungal cells respectively for Recombinant DNA technology.
26. (a) Identify the curves 'a' and 'b' shown in the graph given below. List the conditions responsible for growth patterns 'a' and 'b'. (3)

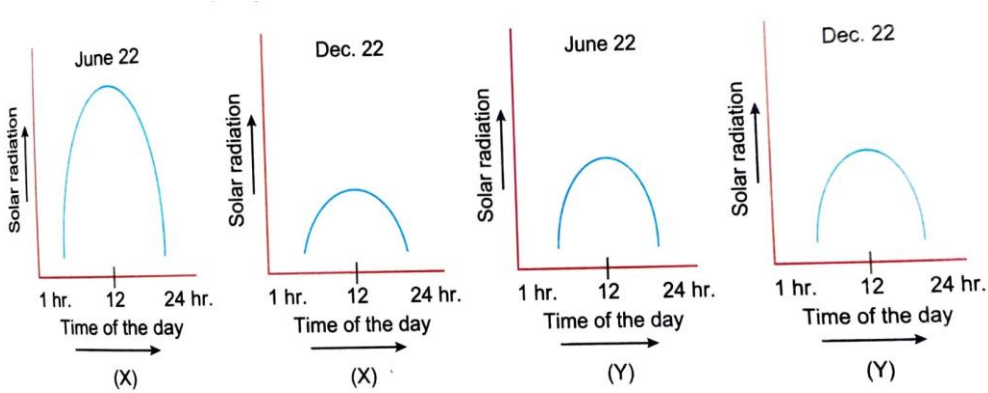


- (b) What is r in the given equation and what does K denotes
- $$\frac{dN}{dt} = rN \left(\frac{K-N}{K} \right)$$
27. Why do lepidopterans die when they feed on Bt cotton plant? Explain how does it happen. (3)
28. (a) What is Ramsar convention? Give an example for wet land (3)
 (b) What are the three pillars of Ramsar convention?

SECTION – D

Read the following questions 29 & 30 – Paragraph / Data and answer any four of the following questions given below:

29. The graphs (X) and (Y) given below depict the diurnal variations in the solar radiations in the month of June (Summer) and in December (Winter): (4)



- Which of the two graphs depicts tropical region and temperate regions respectively?
- Which of the two regions (X) or (Y) will show high biological diversity and why?
- Which place in the earth got highest bio diversity?
- Which one of the following statements is incorrect
 - South America has the bio diversity of 427 species of amphibians
 - South America has the bio diversity of 8300 species of Birds
 - South America has the bio diversity of 40000 species of Plants
 - South America has the bio diversity of 427 species of Mammals
- Give an example to show that species richness varies in different location.

30. (4)

Assisted Reproductive Technology (ART) refers to treatment and procedures that aim to achieve pregnancy. These complex procedures may be an option for people who have already gone through various infertility treatment options but who still have not achieved pregnancy. The main type of ART is In Vitro Fertilisation (IVF), IVF involves extracting a woman's eggs, fertilising the eggs in the laboratory and then transferring the resulting embryos into the woman's uterus through the cervix. ART success rates vary in the context of patient and treatment characteristics, such as age, infertility diagnosis, number of embryos transferred, type of ART procedure, use of techniques such as ICSI and history of previous births, miscarriages and ART cycles.

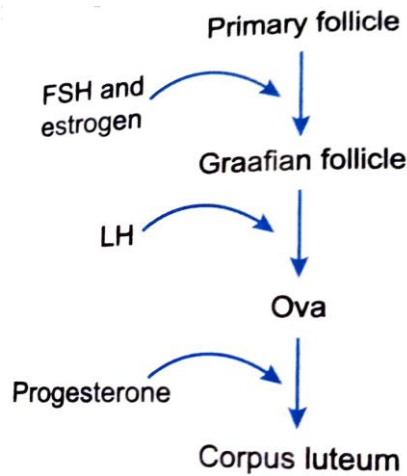
- A woman whose womb is used as a substitute for the biological mother to nurse the embryo is called
 - interrogate mother
 - surrogate mother
 - Step mother
 - Nurse mother
- The stage of cells at which it is transferred into the uterus after induced fertilisation of ova in the laboratory is
 - embryo at 4 blastomeres stage
 - embryo at 2 blastomeres stage
 - morula
 - zygote
- Artificial reproductive techniques are not always applicable because
 - it is an expensive technique, hence only few people can afford it
 - it is not possible in women with damaged uterine wall
 - it has raised ethical, legal and moral concerns
 - All of the above
- Assertion(A): Both ZIFT and IUT are embryo transfer techniques.
Reason(R): In both ZIFT and IUT, the number of cells in zygote is same.
 - both A and R are true and R is the correct explanation of A
 - both A and R are true, but R is not the correct explanation of A
 - A is true, but R is false
 - both A and R are false

(v) How is GIFT different from ZIFT?

- (a) Transfer of gamete and embryo transfer
- (b) Embryo transfer and gonad transfer
- (c) Embryo transfer and gamete transfer
- (d) Transfer of gonad and embryo transfer

SECTION – E

31. Given below is a flowchart showing ovarian changes during menstrual cycle. (5)

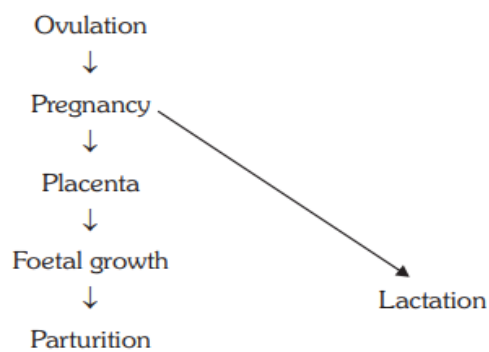


Answer the following questions based on the information given.

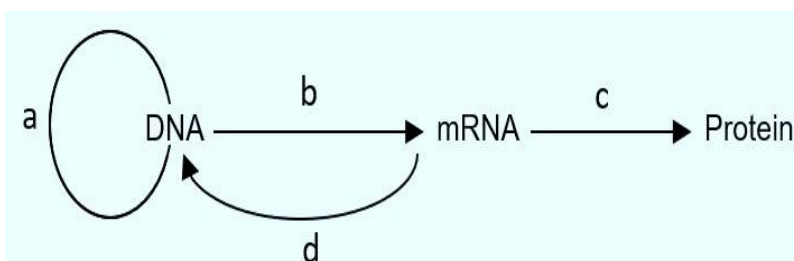
- (a) Menstrual cycles are absent during pregnancy. Why?
- (b) Given below are the stages in human reproduction. Write them in correct sequential order.
Insemination, Gametogenesis, Fertilisation, Parturition, Gestation, Implantation
- (c) Name two hormones that can be found only in the blood of a pregnant woman. Mention the source organ/ tissue that secretes each of them.

(OR)

Study the flow chart given below. Name the hormones involved at each stage and explain their role.



32. i) Who proposed the idea of Central Dogma. (5)
- ii) Identify processes **a**, **b**, **c** and **d** in the following diagram.



- iii) Write the name of enzymes in processes **a**, **b**, **c** and **d**.
- iv) Give one example where the process '**d**' is essential for the completion of the life cycle.

(OR)

The lac operon is an operon or group of genes with a single promoter (transcribed as a single mRNA). The genes in the operon encode proteins that allow the bacteria to use lactose as an energy source. Study the following schematic representation of the genes, involved in the lac operon of *E. coli* and give answers to the following questions

i	P	O	z	Y	a
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- Which one is responsible for the synthesis of repressor? Write the name along with the symbol.
 - What is the binding site for the repressor?
 - Which one is responsible for the entry of lactose into the bacteria?
 - Complete the drawing to show the process in the presence of an inducer
33. Using a Punnett square, work out the distribution of phenotypic features in the first filial generation after a cross made between a homozygous female and a heterozygous male for a single locus. (5)

(OR)

When a cross is made between tall plant with yellow seed (TtYy) and tall plant with green seed (Tt yy), what proportions of phenotype in the offspring could be expected to be (a) tall and green (b) dwarf and green?

End of paper