

MARKING SCHEME

XII - BIOLOGY

Section - A

- A1 coconut is bisexual and bears both stamens & pistil . Date palm is a dioecious as the unisexual male flower is staminate & Female plant is pistillate [1 Mark]
- A2 • meiocyte has 32 chromosomes (2n)
• hence its gamete will have $32/2 = 16$ chromosomes
• therefore endosperm will have
 $16 \times 3 = 48$ chromosomes (3n) [1 Mark]
- A3 (a) 6 , (b) 4 [1 Mark]
- A4 Seed ferns [1 Mark]
- A5 Source - latex of poppy plant (*Papaver somniferum*) = $\frac{1}{2}$
Effect - Acts as a depressant. = $\frac{1}{2}$ [1 Mark]
- A6 The plant cells are bombarded with high velocity micro - particles of gold or tungsten coated with DNA in a method known as biolistics or gene gun. [1 mark]
- A7 Third trophic level [1 Mark]
- A8 pug marks and faecal pellets [1 Mark]

Section - B

- A9 A - Chasmogamous flower = $\frac{1}{2}$
B - Cleistogamous flower = $\frac{1}{2}$
Cleistogamous flower produces an assured seed set. [1 Mark]
- A10 **Male Partner :** Vasectomy - a small part of the vas deferens is removed or tied up through a small incision in the scrotum.
Female Partner : Tubectomy - a small part of the fallopian tube is removed or tied up through a small incision in the abdomen or through vagina. [1 Mark]

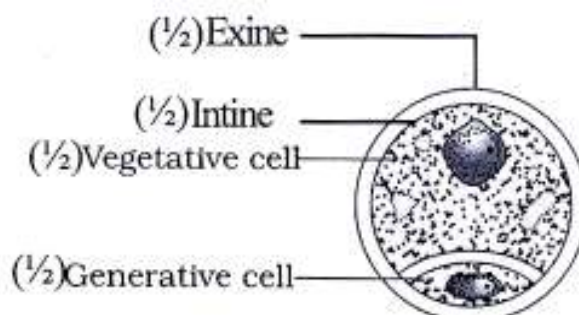
OR

CuT release Cu^+ ions, increases phagocytosis of sperms, suppresses sperm motility, and reduces fertilising capacity. = $\frac{1}{2} \times 4 = 2$

[2 Marks]

- A11 Genotype of human male is - XY
 Genotype of female bird is - ZW = ½
 The sex chromosomes are dissimilar and hence are called heterogametic. = ½
 Genotype of human female is XX
 Genotype of male bird is ZZ = ½
 The sex chromosomes are similar, hence homogametic = ½
 [½ + ½ + ½ + ½ = 2 Marks]
- A12 Interferons are proteins secreted by virus - infected cells. = ½
 Role : It protects non - infected cells from further viral infection = 1
 Innate Immunity = ½
 [½ + 1 + ½ = 2 Marks]
- A13 The exaggerated response of the immune system to certain antigens present in the environment = ½
 IgE = ½
 Histamine and serotonin = ½ + ½ = 1
 [½ + ½ + 1 = 2 Marks]
- A14 (a) Bottled juices are clarified by the use of pectinases and proteases = ½ + ½ = 1
 (b) Large holes are due to production of large amount of CO₂, by a bacterium named *Propionibacterium sharmanii* = ½ + ½ = 1
 [1 + 1 = 2 Marks]
- A15 (i) Inside stomach / intestine of Mosquito host
 (ii) In the blood of human host
 (iii) Into the blood of human host
 (iv) Inside liver cells and RBCs of human host.
- A16 Surgery, radiation therapy, chemotherapy and immunotherapy
 [½ × 4 = 2 Marks]
- A17 (a) Thorns are the most common morphological means of defence eg. Acacia and Cactus = 1
 (b) Many plants produce and store toxic chemicals such as cardiac glycosides to discourage browsing animals. eg. Calotropis = 1
 [1 + 1 = 2 Marks]
- A18 (a) Grazing food chain starts from producers while detritus food chain starts from organic matter = 1
 (b) Grazing food chain is the major conduit of energy flow in an ecosystem = 1
 [1 + 1 = 2 Marks]

Section - C



Exine - It can withstand high temperature / strong acids / alkali

Intine - It is a thin and continuous layer made up of cellulose and pectin

Vegetative Cell - It is bigger, has abundant food reserve.

$$= \frac{1}{2} \times 4 = 2$$

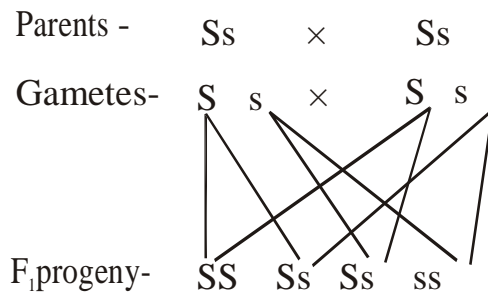
Generative Cell - It divides mitotically to give rise to two male gametes. (any two = $\frac{1}{2} \times 2 = 1$)

[2 + 1 = 3 Marks]

A20 Smooth seed coat (dominant) = S

Wrinkled seed coat (recessive) = s

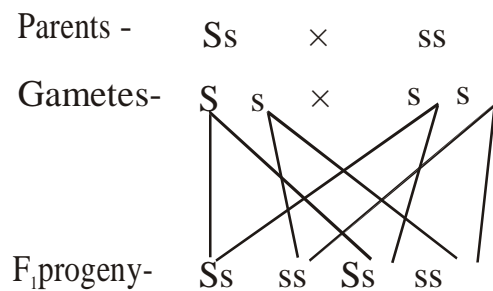
(i) Heterozygous smooth \times Heterozygous smooth



3 smooth : 1 wrinkled

= 3 : 1 ratio

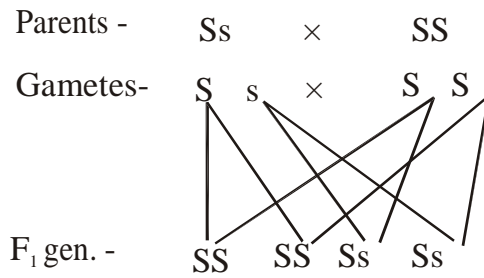
(ii) Heterozygous smooth \times Homozygous wrinkled



Phenotype - 2 smooth : 2 wrinkled

= 1 : 1

(iii) Heterozygous smooth \times Homozygous smooth



Phenotype - All smooth
= 1 : 0

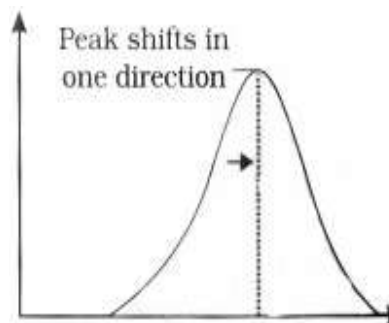
[1+1+1 = 3 Marks]

- A21 (i) Initiation = 1
(ii) mRNA codon = AUG = 1
(iii) The densely packed and dark stained / transcriptionally inactive chromatin is called as heterochromatin = 1

[1+1 + 1 = 3 Marks]

- A22 (a) Allelic frequencies in a population are stable and constant from generation to generation. = 1
Gene flow, genetic drift, mutation, genetic recombination, natural selection (any two = $\frac{1}{2} \times 2 = 1$)

(b)



[1 + 1 + 1 = 3 Marks]

- A23 (i) Replication of retrovirus = 1
(ii) a - Plasmamembrane
b- formation of viral DNA by reverse transcriptase $\frac{1}{2} \times 2 = 1$
(iii) ELISA (Enzyme linked immunosorbent assay) = 1

[1 + 1 + 1 = 3 Marks]

OR

- (a) Tobacco contains nicotine – stimulates adrenaline, nor adrenaline into blood stream – increase blood pressure and heart rate.

($\frac{1}{2}+1+\frac{1}{2}$)

- b) anxiety, shakiness, nausea and sweating(1)

A24 nitrates and phosphates overstimulate the growth of algae, causing unsightly scum and unpleasant odors, robbing the water of dissolved oxygen vital to aquatic life $\frac{1}{2} + 1/2 + 1$

b) Accelerated eutrophication.1

[3 Marks]

A25 (i) 'a' – Vector DNA; 'b' – Foreign DNA = $\frac{1}{2}$

(ii) EcoRI

(iii) DNA ligase

[$\frac{1}{2} + 1 + 1\frac{1}{2} = 3$ Marks]

A26 (a) Gel electrophoresis = $\frac{1}{2}$

(b) DNA fragments / bands = $\frac{1}{2}$

(c) Ethidium bromide = 1

(d) The separated bands of DNA are cut out from agarose gel and DNA extracted from gel piece = 1

A27

(a) ori is a sequence from where replication starts and any piece of DNA to replicate in the host cell needs to be linked to it. also controls the copy number of the linked DNA

b) i) ampR The ligation of alien DNA is carried at a restriction site present in any antibiotic resistant gene. ii) rop-codes for the protein involved in the replication of the plasmid

Section - D

[1 + 1 + 1 = 3 Marks]

A28 • After implantation the chorionic villi and uterine tissue become interdigitated to form placenta.

- Placenta facilitates supply of O_2 & nutrients to the embryo and removes CO_2 & excretory materials produced by the embryo.
- Increased production of hormones like estrogens, progesterone, prolactin are essential for supporting foetal growth, metabolic changes in the mother & maintenance of pregnancy.
- The inner cell mass differentiates into three distinct germ layers (mesoderm, ectoderm & endoderm) which give rise to all tissues (organs) in adults.
- After one month of pregnancy the embryo's heart is formed.
- By the end of the second month of pregnancy the foetus develops limbs & digits.
- By the end of 12 weeks (first trimester) most of the major organ systems are formed.
- By the end of 24 weeks (second trimester) the body is covered with fine hair, eye-lids separate and eyelashes are formed.
- The signals for parturition originate from the fully developed foetus and the placenta which induce mild uterine contractions called foetal ejection reflex.
- This triggers release of oxytocin from maternal pituitary along with stimulatory reflex resulting in stronger contractions leads to parturition. = $\frac{1}{2} \times 10 = 5$

[5

Marks] OR

- Incompatibility is considered as the most widespread & effective device to prevent inbreeding and outbreeding.
- Pollen pistil interaction is a dynamic process involving pollen recognition followed by promotion or inhibition of the pollen.
- It acts as a natural barrier by the interaction of chemical substances produced by the style.
- Normally the pollen belonging to right mating type germinate on stigma, develop pollen tube & bring about fertilization.
- The pollen grains belonging to other mating type are discarded = $1 \times 5 = 5$

[5 Marks]

30. (a) (i) It is a fine powder of recycled modified plastic. This mixture is mixed with bitumen used to lay roads = 1
Raw material - Plastic film waste = 1
- (ii) Blends of polyblend & bitumen, when used to lay roads, enhances the bitumen's water repellent properties and helps to increase road life by a factor of three = 1
- (b) Irreparable computers and other electronic goods are known as e-wastes = 1
Buried in landfills or incinerated = 1

[1+1+1+1+1 = 5

