

SET	A
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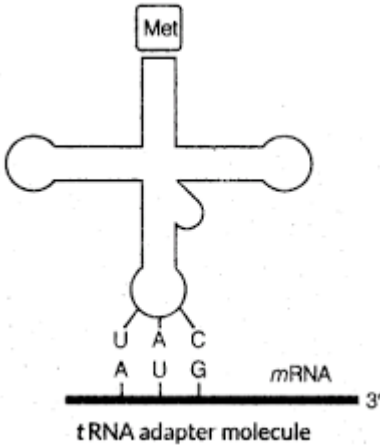
**INDIAN SCHOOL MUSCAT
HALF YEARLY EXAMINATION 2022
044 BIOLOGY**

CLASS:XII

Max.Marks: 70

MARKING SCHEME			
SET	QN.NO	VALUE POINTS	MARKS SPLIT UP
A	1	c) Pollen-pistil interaction	1
	2	a) 30 days of pregnancy	1
	3	d) extra copy of X chromosome	1
	4	c) i and iv	1
	5	b) peptide bond formation between two aminoacids	1
	6	a) 87.5% light and 12.5% hybrid	1
	7	LNG20/ Progestasert	1
	8	Unequal division	1
	9	Lysine and Arginine	$\frac{1}{2} + \frac{1}{2}$
	10	5' UACGCCG 3'	1
	11	C	
	12	B	
	13	A	
	14	D	
	15	i) b ii) c iii) a iv) d	1 x 4

	16	i) c ii) a iii) c iv) b	$\frac{1}{2} \times 4$
	17	<p>When more than one adaptive radiation appeared to have occurred in an isolated geographical area and two or more groups of unrelated animals resemble each other for similar mode of life or habitat, it is called convergent evolution.</p> <p>Divergent evolution – in some animals the same structures developed along different directions due to adaptations to different needs. This is known as divergent evolution.</p>	1+1
	18	<p>Male – acts on leydig cells to secrete androgen and factors.</p> <p>Female – LH surge during the middle of the cycle leads to ovulation</p>	1+1
	19	<ul style="list-style-type: none"> • the males and females in the fruit flies or drosophila could be easily distinguished on the basis of their body size. • their reproductive cycle is complete within a short span of time and it is possible to observe various generations within a few months, which is very helpful in reasearch. • they also produce a larger progeny providing grounds for the better researches as compared to other organisms. • the main reason is that they are easy to be kept under laboratory conditions for research and are also inexpensive in conducting researches 	2

20	<table><tr><th>Heterochromatin</th><th>Euchromatin</th></tr><tr><td>1. It is a tightly packed form of DNA in the chromosomes.</td><td>1.It is a loosely packed form of DNA in the chromosomes.</td></tr><tr><td>2.It stains dark.</td><td>2.It stains lightly</td></tr><tr><td>3.Found in the periphery of the nucleus in the eukaryotic cells.</td><td>3.Found inside the nucleus of both the prokaryotic and eukaryotic cells.</td></tr><tr><td>4.It is genetically inactive.</td><td>4.It is genetically active.</td></tr><tr><td>5.They are compactly coiled.</td><td>5.They are highly coiled.</td></tr></table> <p style="text-align: center;">OR</p> <div style="text-align: center;"></div>	Heterochromatin	Euchromatin	1. It is a tightly packed form of DNA in the chromosomes.	1.It is a loosely packed form of DNA in the chromosomes.	2.It stains dark.	2.It stains lightly	3.Found in the periphery of the nucleus in the eukaryotic cells.	3.Found inside the nucleus of both the prokaryotic and eukaryotic cells.	4.It is genetically inactive.	4.It is genetically active.	5.They are compactly coiled.	5.They are highly coiled.	2
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21	Acrosome has enzymes to digest zona pellucida layer to facilitate fertilization. Fimbriae are structures for collecting the ovum released by the ovary during ovulation.	2												
22	This principle states that allele frequencies in a population are static and is constant from generation to generation. Thus the gene pool remains a constant which is also called as genetic equilibrium.	1+1												

		The distribution of genes is described by the relationship $A^2+2Aa+a^2= 1$ where A^2 represents the frequency of the homozygous dominant genotype. $2Aa$ represents the frequency of the heterozygous genotype and a^2 represents the frequency of the homozygous recessive genotype.	
	23	Fusion of male gamete with secondary nucleus is called triple fusion. It occurs in the embryo sac.	1+1
	24	Apomixes is the production of seeds without fertilization. Hybrid seeds can be cultivated with the help of apomixis. It helps the farmers to reduce the use of expensive hybrid seeds each time. OR Labeled diagram with 4 correct labelings	1+1 $\frac{1}{2} \times 4$
	25	Synthesis of a polypeptide chain terminated when a stop codon of mRNA reaches the A site. UAA, UGA, UAG. Release factor bind to the m RNA and terminates the process	1+1
		SECTION C	
	26	<ul style="list-style-type: none"> oogenesis is process by which female gametes (egg cells) are produced in the ovary it begins during fetal development when oogonia are formed from primordial germ cells by mitosis Oogonia undergoes growth to form primary oocytes primary oocyte begin first meiotic division but stop in Prophase I until on set of puberty at puberty some follicles develop each month in response to FSH produced by pituitary gland primary oocyte completes first meiotic division to forms two cells of different sizes due to unequal distribution of cytoplasm the one with less cytoplasm become the first polar body which eventually degenerates the larger cell becomes secondary oocyte and proceeds to meiosis II & stops at prophase II meiosis II is completed if cell is fertilized forming an ovum and second polar body 	3
	27	(a) GGAA and ggaa (b) Plant with green pod and axial flowers; GgAa (c) 9:3:3:1	3X1
	28	Stable, less reactive, able to replicate, slow mutation (any three)	3X1

29	<p>Frederick Griffith performed experiments on <i>Streptococcus pneumoniae</i> which is responsible for causing pneumonia. He observed that the bacteria produce two colonies as:</p> <p style="padding-left: 40px;">R strain: rough colonies which are non-virulent.</p> <p style="padding-left: 40px;">S strain: smooth colonies which are virulent and caused the death of mice.</p> <p>He observed that S cells are virulent due to the production of a smooth polysaccharide coat which is absent in R cells. He performed the following experiment:</p> <p style="padding-left: 80px;">Mice + R- cell bacteria ----> Mice lived</p> <p style="padding-left: 80px;">Mice + S- cell bacteria -----> Mice died</p> <p>Then he killed S- celled bacteria by heating which cause denaturation of its genetic material and then injected in mice.</p> <p style="padding-left: 80px;">Mice + Heat killed S- cells -----> Mice lived</p> <p>Now he injected mice with heat killed S- cells and non-virulent R- cells.</p> <p style="padding-left: 80px;">Mice + Heat killed S- cells + R-cells ----->Mice died.</p> <p>Then he recovered living S- cells from the dead mice.</p> <p>Then he concluded that some transforming principle had been transferred from heat killed S- cell to living R- cells which enables R- cells to secrete polysaccharide coat and become virulent.</p> <p style="text-align: center;">OR</p> <p>Antirrhinum major/ snap dragon/ mirabilis</p> <p>Homozygous red flower vs white flower produces all pink in the F1</p> <p>Red, pink and white in the ratio 1:2:1 in F2</p> <p>Dominant allele is partially dominant over the other cross</p>	2+1
30	<p>Industrial Melanism is an adaptation, where the moths living in the industrial area developed melanin pigments to match their body to the tree trunk that were covered with black soot.</p> <p>Before industrialization in Great Britain, it was observed that there were more white winged moths. The white coloured lichens covered the tree trunks. In that the white winged moth survived and dark coloured moths were eaten by the predators. During the post industrialization period the tree trunks became dark due to the industrial smoke and soot. Under such conditions, the white winged</p>	3

		moth did not survive and dark winged moths survived. In areas where industrialization occurred, the count of white moths were low thus industrial melanism supports evolution by natural selection.	
	31	<p>Spermatogonia-primary oocyte-meiosis I-secondary oocyte-meiosisII-spermatids-spermiogenesis-spermatozoa-spermiation</p> <p>FSH acts on sertoli cells to provide nutrition</p> <p style="text-align: center;">OR</p> <p>i) 320 pollen grains one participates in fertilization of one ovule. ii) 320 ovules. One ovule after fertilization. iii) 320MMC were involved. Each MMC forms four megaspores out of which only one remains functional. iv) 80 MMC (320/4). Each megaspore mother cell meiotically divides to form four pollen grains. v) 320x2=640. Each pollen grain carries two male gametes.</p>	<p>9x ½ + ½</p> <p>5X1</p>
	32	<p>(a) Haemophilia is an X linked recessive disorder. Y chromosome has no allele for this. In a male single X chromosome with the gene can express the disease as there is no normal X chromosome to dominate it. For a human female to be haemophilic her father should be haemophilic and mother a carrier of the disease. (b) Sex linked disorder/ autosomal disorder. Defective gene is located on the X chromosome/ controlled by the allele Hbs.</p> <p style="text-align: center;">OR</p> <p>(a) Autosomal recessive disorder due to Trisomy of 21st chromosome. Short statured with small round head/furrowed tongue/partially open mouth, broad palm with palm crease/physical, psychomotor and mental development retarded. Non disjunction of 21st chromosomes during anaphase results in trisomy. (b) 44+XO</p>	<p>3+2</p> <p>1+2+1+1</p>
	33	<p>Initiation, elongation and termination with mention of enzymes involved and transcription unit.</p> <p style="text-align: center;">OR</p> <p>Francois Jacob and Jack Monod. Diagram. Lactose acts as an inducer which binds to the repressor protein and opens the operator site.</p>	<p>5</p> <p>1+2+2</p>