SET	A

INDIAN SCHOOL MUSCAT
HALF YEARLY EXAMINATION 2023
BIOLOGY (044)

CLASS:XII Max.Marks: 70

MARKING SCHEME			
SET	QN.NO	VALUE POINTS	MARKS SPLIT UP
A	1	b)A-T-purines	1
	2	d. pedigree analysis	1
	3	(c) (ii) and (iv)	1
	4	d. Sex linked recessive	1
	5	b) 32%	1
	6	D) GUG	1
	7	(b) ejaculatory duct	1
	8	b) co dominance	1
	9	c) regulator gene	1
	10	(a) corona radiata	1
	11	(a) 1950s	1
	12	c. RNA polymerase	1
	13	A	1
	14	C	1
	15	B	1

	16	A	1
	17	i) Klinefelter's syndrome ii) Down syndrome OR The child will have a karyotype of 44 autosomes+XXY and it is Klinefelter's syndrome/	1+1
	18	Spermiogenesis – process of transformation of spermatids to spermatozoa. Spermiation – removal of spermatids from the seminiferous tubules.	1+1
	19	C 7CM A 3CM B CAB	1+1
	20	<table><tr><td>Vegetative cell</td><td>Generative cell</td></tr><tr><td>Larger and irregular shaped. Its cytoplasm is less dense and nucleus is large and irregular shape It has abundant food reserve It does not divide further</td><td>It is smaller and spindle shaped It has a dense cytoplasm and a small round nucleus It does not have food reserve It divides mitotically to form two male gametes.</td></tr></table>	
	21	Reasons: There is a rapid decline in the death rate, maternal mortality rate and infant mortality rate (IMR) There is an increase in the number of people in reproductive age. Steps by Government Statutory raising of marriageable age of the females to 18 years and that of males to 21 years. Providing incentives to couples with small families.	3x1
	22	a) The primary endosperm nucleus undergoes repeated mitotic divisions, to give rise to a number of free nuclei in the primary endosperm cell; at this stage the endosperm is called free nuclear endosperm. Subsequently cell wall formation starts from the periphery and the endosperm becomes cellular. The water in the tender coconut represent the nuclear endosperm, while the white kernel represents the cellular endosperm. b) Since the endosperm cells are rich in stored food materials, it is a healthy source of nutrition. c) Pea seeds are non-endospermic, while castor seeds are endospermic.	3x1
	23	Law of Dominance. In the F1 all plants showed the dominant trait purple. F2 generation shows 3:1 ratio. Cross	1+1+1
	24	<table><tr><td>Follicular</td><td>luteal</td></tr><tr><td>Primary follicles grow to become</td><td>Ruptured Graafian follicle tranforms</td></tr></table>	3x1

		mature Graafian follicle	into corpus luteum
		Extends upto 10-12 days	13-14 days after ovulation
		Changes due to high levels of FSH, LH and, ostrogen	Large amount of progesterone is secreted

	25	GnRH or gonadotropin releasing hormone is a hypothalamic hormone. Spermatogenesis starts at puberty due to its significant increase. Its increased levels acts on anterior pituitary gland and stimulates the secretion of LH and FSH. LH acts on the Leydig cells and stimulates synthesis and secretion of androgens. FSH acts on Sertoli cells, which stimulates the secretion of some factors that help in spermiogenesis.	3x1
	26	The assisted reproductive technologies enable the infertile couples to have children. ZIFT refers to the method of embryo transfer in the test tube baby programme in which the zygote or embryo upto 8 blastomeres is transferred into the fallopian tube. GIFT refers to transfer of an ovum collected from a donor female into the fallopian tube of another female, who cannot produce an ovum but can provide suitable conditions for fertilization and pregnancy. Intrauterine transfer refers to the transfer of embryo with more than 8 blastomeres into the uterus of a female.	1+1+ ½ + ½
	27	3/8 plants will be tall green. 1/8 will be short green. cross	1x3
	28	RNA is the first genetic material because: (i) RNA can directly code for the synthesis of proteins and hence can easily express the character it is the genetic material in many viruses. (ii) RNA can also act as a catalyst; there are some important biochemical reactions in living systems that are catalyzed by RNAs and not proteins. (iii)Many essential life processes like splicing, translation etc. have evolved around RNA.	1X3
	29	i) C pleiotropic genes ii) A phenylketonuria iii) B starch size and seed shape in pea iv) In phenyl ketonuria the patient will develop mental retardation due to accumulation of phenyl alanine in the brain. Lack of tyrosine leads to lack of pigmentation of skin and hair. OR In pleiotropy one gene has multiple phenotypic effects. In polygenic inheritance, many genes control one effect.	4
	30	(1) B. morula (2) A. endometrium of uterus (3) D. Zygote-morula-blastula-gastrula (4) C. Fimbriae	4

	31	i) I gene is the regulatory gene/ it produces repressor protein which will bind to the operator site and switch off the lac operon. (1½) ii) Negative regulation (1) iii) Lactose is the substrate for the enzyme beta-galactosidase and it regulates switching on and off of the operon. Hence, it is termed as inducer. ⎪ The „z" gene codes for beta-galactosidase (b-gal), which is primarily responsible for the hydrolysis of the disaccharide, lactose into its monomeric units, galactose and glucose. ⎪ The „y" gene codes for permease, which increases permeability of the cell to b-galactosides. The „a" gene encodes a transacetylase an enzyme that catalyzes the transfer of an acetyl group from Acetyl CoA to another molecule (galactosides, lactosides and glucosides) during metabolism of lactose. ⎪ Hence, all the three gene products in lac operon are required for metabolism of lactose. (2 ½) OR Correct explanation or diagrammatic representation.	5
	32	The different parts of human female oviduct through which the ovum travels, till it gets fertilised are given below in the sequence. (i) Fimbriae, finger-like projections Collect or catch the ovum, after ovulation. (½) (ii)Infundibulum Ovum from fimbriae is guided into funnel-shaped infundibulum, part of Fallopian tube. (½) (iii) Ampulla A wider part of oviduct that leads ovun into isthmus. (1) (iv) Isthmus With narrow lumen, and in the portion or junction of ampulla-isthmus, the ovum gets fertilised.(1) b. Blastocyst (1) Diagram (1) OR A) Once a week pill/ with very few side effects/high contraceptive value/ prevents pregnancy.(2) B) Any one point (1) C) ZIFT – when the zygote at 8 celled stage is transferred to the fallopian tube (1) IUT – when the zygote more than 8 celled stage is implanted in the uterus (1)	5

	33	a) When two pairs of traits are combined in a hybrid segregation of one pair of character is independent of the other pair of character (1) b) Eg: Round Yellow (RrYy) x Round Yellow (RrYy) cross **OR** Human blood group is determined by antigen A or B. (1) Genotypes of 4 blood groups.(2) Law of Dominance, Law of codominance and multiple alleles. (2)	5

SET	B

INDIAN SCHOOL MUSCAT
HALF YEARLY EXAMINATION 2023
BIOLOGY (044)

CLASS:XII Max.Marks: 70

MARKING SCHEME			
SET	QN.NO	VALUE POINTS	MARKS SPLIT UP
B	1	d. pedigree analysis	1
	2	c) 1000	1
	3	c.RNA polymerase	1
	4	c. secondary oocyte	1
	5	a) A-T-purines	1
	6	b) Sex linked recessive	1
	7	c. ICSI	1
	8	c) regulator gene	1
	9	D) GUG	1
	10	b) 32%	1
	11	(b) opening of vas deferens into urethra	1
	12	b) co dominance	1
	13	A	1
	14	A	1
	15	B	1
	16	C	1

	18	Among the common STDs, hepatitis-B and AIDS are not infections of the reproductive organs though their mode of transmission could be through sexual conact also. All other diseases like gonorrhoea, syphilis, genital herpes, hepatitis-B are transmitted through sexual contact and are also infections of the reproductive tract so, there are STDs and RTI, Whereas, AIDS and hepatitis are STDs but not RTI.	2
	19	The correct sequential order of artificial hybridisatian is as following (a) Selection of parents. (b) Emasculation (removal of anthers from the flower bud before the anther dehisces). (c) Bagging (process to cover the emasculated flower with a bag made up of butter paper). (d) Collection of pollen from other male plant. (e) Dusting of pollen on stigma. (f) Re-bagging	2
	28	(i) If histones were mutated and made rich in acidic amino acids. They will not be able to serve the purpose of keeping the DNA coiled around them. This is because DNA is negatively charged molecule and histones are positively charged because of basic amino acids. So, they are attracted to each other. If histones become negatively charged, instead of binding, they will rather repel DNA. The packaging of DNA in eukaryotes would not happen. Consequently, the chromatin fibre would not be formed. Start codon, codes for methionine	3

SET	C

INDIAN SCHOOL MUSCAT
HALF YEARLY EXAMINATION 2023
BIOLOGY (044)

CLASS:XII Max.Marks: 70

MARKING SCHEME			
SET	QN.NO	VALUE POINTS	MARKS SPLIT UP
C	1	a) RNA polymerase	1
	2	c) Secondary oocyte	1
	3	(d) Pedigree analysis	1
	4	(d) Isthmus	1
	5	c) Regulator gene	1
	6	(b) Co-dominance	1
	7	b) 11-17 day of menstrual cycle	1
	8	D) GUG	1
	9	b) 32%	1
	10	(d) Sex-linked recessive	1
	11	(c) pollen grain	1
	12	b) Adenine -Thymine -purines	1
	13	A	1

	14	A	1
	15	B	1
	16	C	1
	20	Hydrophilly. Pollen released into the water and taken to the female flower and pollination happens.	1+1
	21	Make the uterus unsuitable for implantation and cervix hostile for sperms.	1+1
	22	Apomixis- formation of seeds without fertilization. It helps in solving the problem of using expensive HYV seeds. Parthenocarpic fruits are formed without fertilization.	1+1+1
	28	In the strand with polarity 5’ to 3’ new strand can be polymerized only in 5’ to 3’. As a result many fragments form called okazaki fragments. Later they will be joined together to form continuous strand.	1+1+1