

TERM EXAMINATION

APRIL/MAY 2018

CLASS XII

Marking Scheme – BIOLOGY [THEORY]

Q.NO	Answers	Marks (with split up)
1.	a) Yeast; b) Conidiophore	$\frac{1}{2} + \frac{1}{2}$
2.	38	1
3.	Male- Androecium; Female- Gynoecium	$\frac{1}{2} + \frac{1}{2}$
4.	Clitoris	1
5.	Genes that govern the multiple phenotypic effects.	1
6.	a)Male –Antheridium; Female- Archegonium. b)Homothallic. Because male and female reproductive organs are found in the same individual organism.	$\frac{1}{2}$ Each 1
7.		
8.	Pollen grains are rich in nutrients/ It is to increase the performance of athletes and race horses	1+1
9.	Secretions of these glands constitute the seminal plasma which is rich in fructose, calcium and certain enzymes./The secretions of bulbourethral glands also helps in the lubrication of the penis.	1+1
10.	One egg is released per month./one egg only getting fertilized.	1+1
11.	Any two symbols with reasons	2
12.	a) XO b) XX-XY c) WW-ZW d) XX-XY OR Cross between organism of unknown genotype (expressing dominant trait), and an organism with recessive trait (homozygous)= $\frac{1}{2} + \frac{1}{2}$ If all offsprings show dominant trait the organism is homozygous (dominant), if half organisms show dominant and recessive then the organism is heterozygous (dominant)= $\frac{1}{2} + \frac{1}{2}$	4 x $\frac{1}{2}$ $\frac{1}{2} + \frac{1}{2}$ $\frac{1}{2} + \frac{1}{2}$
13.	Fungi&algae/ <i>Penicillium</i> / <i>Hydra</i> /sponge formation of vegetative propagules does not involve two parents, the process involved is asexual.	
14.	Wind. pollen grains are light and non-sticky/well-exposed stamens/large often-feathery stigma/have a single ovule in each ovary and numerous flowers packed into an inflorescence (for any two features)	1+2
15.	- formation of seeds without fertilisation.- grasses - Some angiosperms produce more than one embryo in their seed-Citrus - Formation of fruits without fertilization.- Banana	1+1+ 1
16.	Synchrony between release of pollen and stigma receptivity/ proximity between anther and stigma. <i>Commelina, Viola and Oxalis</i>	1+1+ 1
17.	pollen grain germinates on the stigma to produce a pollen tube through one of the germ pores.	6X $\frac{1}{2}$

	<p>The contents of the pollen grain move into the pollen tube. Pollen tube grows through the tissues of the stigma and style and reaches the ovary. Pollen tube, after reaching the ovary, enters the ovule through the micropyle /and then enters one of the synergids through the filiform apparatus./</p> <p>OR</p> <p>i) To obtain nutrition from the endosperm for the developing embryo = 1 ii) for the entry of water / oxygen, for germination = $\frac{1}{2} + \frac{1}{2} = 1$ iii) Ovary is not taking part in fruit formation / thalamus contributes to fruit formation = 1</p>	<p>1 1 1</p>
18.	Zygote moves through isthmus and undergoes cleavage (forming morula) , morula continues to divide and transform into blastocyst (as it moves further into uterus) , Blastomeres in the blastocyst are arranged into an outer layer trophoblast , and inner cell mass , the trophoblast layer gets attached to endometrium , uterine cells divide and cover the blastocyst = $\frac{1}{2} \times 6$	3
19.	<p>Primary follicle- primary oocyte with a few layers of follicular cells Graafian follicle- secondary oocyte with many layers of follicular cells/ With primary polar body.</p>	1+1+1
20.	The blastomeres in the blastocyst are arranged into an outer layer called trophoblast/ and an inner group of cells attached to trophoblast called the inner cell mass/. The trophoblast layer then gets attached to the endometrium /and the inner cell mass gets differentiated as the embryo/. After attachment, the uterine cells divide rapidly and covers the blastocyst./ As a result, the blastocyst becomes embedded in the endometrium of the uterus /. This is called implantation and it leads to pregnancy.	6X $\frac{1}{2}$
21.	<p>Milk production in the mammary gland toward the end of pregnancy. Consists of antibodies necessary for developing disease resistance. For healthy baby.</p>	1+1+1
22.	<p>a) sperm tail b) As soon as first sperm head has touched the membrane, zona pellucida brings some changes in the membrane of the ovum, which block the entry of other sperms. c) haploid nucleus</p>	1+1+1
23.	Point mutation and frame shift mutations. many chemical and physical factors that induce mutations. These are referred to as mutagens	1+1+1
24.	<p><i>Drosophila melanogaster</i> They could be grown on simple synthetic medium in the laboratory. They complete their life cycle in about two weeks, and a single mating could produce a large number of progeny flies. Also, there was a clear differentiation of the sexes – the male and female flies are easily distinguishable. Also, it has many types of hereditary variations that can be seen with low power microscopes.</p>	1 4X $\frac{1}{2}$
25.	<p>a) fertilization of haploid egg cell by one haploid male gamete to form diploid zygote is called syngamy $\frac{1}{2} \times 3 = 1 \frac{1}{2}$ fertilization of two (diploid) polar nuclei by the other haploid male gamete to form triploid primary endosperm nucleus is called triple fusion = $\frac{1}{2} \times 3 = 1 \frac{1}{2}$ diagram with four labeling 2m</p> <p>OR</p> <p>(a) Less number of pollen grains / less number of male gametes were available / all pollen grains did not germinate / all pollen grains did not form pollen tubes / many pollen were not compatible</p>	5

	<p>/ 40 ovules did not get fertilised / only 480 ovules were fertilised = 1</p> <p>(b) Zygote divides (mitotically) to give rise to pro embryo , globular , heart shaped , mature embryo (give marks if all stages shown correct diagrammatically) = $\frac{1}{2} \times 4 = 2$</p> <p>(c) Albuminous - Endosperm is not completely used up during embryo development / residual endosperm found in the seed = 1</p> <p>Exalbuminous - Endosperm is completely consumed / no residual endosperm is left in seed = 1</p>	
26.	<p>(a) (i) Corpus luteum - progesterone, essential for maintenance of the endometrium = $\frac{1}{2} + \frac{1}{2}$</p> <p>Placenta - hCG / human chorionic gonadotropin , produced during pregnancy / stimulates and maintains the corpus luteum / to secrete progestogens / growth of mammary glands</p> <p>hPL / human placental lactogen , produced during pregnancy</p> <p>Estrogen , maintenance of pregnancy / supporting foetal growth / metabolic changes in mother</p> <p>Progestogens , maintenance of pregnancy / supporting foetal growth / metabolic changes in mother (Any two) = $\frac{1}{2} \times 4$</p> <p>(ii) Follicular phase : LH / FSH , stimulates follicular development / secretion of estrogen by growing follicles = $\frac{1}{2} + \frac{1}{2}$</p> <p>Parturition : oxytocin , causes stronger uterine contraction / relaxin , secreted during (later stage) of pregnancy / softens symphysis pubis = $\frac{1}{2} + \frac{1}{2}$</p> <p>(b) (i) pregnancy / gestation = $\frac{1}{2}$</p> <p>(ii) menstruation / proliferative phase / ovulatory phase / follicular phase = $\frac{1}{2}$</p> <p>[3+ 1 + 1 = 5 marks]</p> <p>OR</p> <p>(a) - Initiation by GnRH from hypothalamus which acts on Anterior Pituitary to release FSH & LH (Gonadotropins) = 1</p> <p>-LH acts on cells of Leydig / Interstitial cells to secrete androgens = $\frac{1}{2}$</p> <p>-Androgens in turn stimulate the process of spermatogenesis = $\frac{1}{2}$</p> <p>-FSH acts on Sertoli cells and stimulates the secretions of some factors that stimulate spermiogenesis = 1</p> <p>Diagram – any two parts of the head.</p> <p>Function of plasma membrane: Envelopes the whole body of sperm.</p> <p>Acrosome- contains enzymes for fertilization</p> <p>Nucleus : Contains haploid chromosomal material (Any two = $\frac{1}{2} + \frac{1}{2} = 1$)</p>	5
27.	<p>Working 3 / ratio $\frac{1}{2}$ name of the law $\frac{1}{2}$ definition 1</p> <p>OR</p> <p>- The communication was not easy in those days and his work could not be widely publicised.</p> <p>- His concept of genes as stable and discrete units that controlled the expression of traits and of the pair of alleles which did not ‘blend’ with each other was not accepted by contemporaries as an explanation for the apparently continuous variation seen in nature.</p> <p>- Mendel’s approach of using mathematics to explain biological phenomena was totally new</p>	5

and unacceptable to many of the biologists of his time.

- Though Mendel's work suggested that factors (genes) were discrete units, he could not provide any physical proof for the existence of factors and what they were made of.

(Any three points) = 1 + 1 + 1

OR

- Gene 'I' has three different alleles I^A , I^B , $i = \frac{1}{2}$

- I^A produces A type of sugar / Antigen \longrightarrow A group
- I^B produces B type of sugar / Antigen \longrightarrow B group } = $\frac{1}{2}$

- i - No sugar - O group = $\frac{1}{2}$

- Structure - sugar polymers protrude from the surface of plasma membrane of RBCs = $\frac{1}{2}$