

Sample Question Paper (TERM - I)

Solutions

Section - A

1.	(d) Micropyle is very essential for seed existence because through this pore the water goes inside and germination takes place. gaseous exchange also takes place through these pores. Integument encircle the nucellus except at the tip where a small opening called the micropyle is organized.
2.	(c) In Morula, a mass of 16 totipotent cells are in spherical shape is observed while in blastocyst, it has a cavity inside zona pellucida with inner cell mass.
3.	(b) In coconut endosperm, two types of division takes place cellular and nuclear and it is the female gametophyte not male. In coconut, cellular endosperm surrounds the nuclear endosperm. Nuclear endosperm is a most common type of endosperm.
4.	B. endosperm
5.	D. Zygote Pro-embryo.....Globular embryo.....Mature embryo .
6.	(c) - Mature embryo sac formation takes place in the stigma of female flowers. The stigma contains Megaspore Mother Cell (2n), which goes through one meiotic division to form 2 Megaspores (n) (megaspore dyad) and then 4 Megaspores (n) (megaspore tetrad) from those 2 Megaspores. These Megaspores are arranged vertically.
7.	(a) The types of gametes which will be formed from the given genotype will be RY, Ry, rY, ry.,
8,	(a)

9,	(d) – Rh negative blood is given to Rh negative patients and Rh positive blood or Rh negative blood to Rh positive patients. Therefore 'O' Blood group is considered as universal donor.	
10.	(d) The round spermatid is the first haploid cell produced during spermatogenesis and primary spermatocyte the original large diploid cell into which a spermatogonium develops	
11	B. In many birds, female has a pair of dissimilar chromosomes ZW and male two similar ZZ chromosome	
12	C – Of the 64 different possible codons, 61 specify amino acids and 3 signals stop.	
13	A. who cannot produce an ovum	
14	(d) Both options (a) and (c) are correct. This can be explained as In Klinefelter's syndrome, the sex chromosomes genotype is XXY, i.e. there is one extra X-chromosome. This extra X can come in two conditions, when there is non-disjunction in egg, i.e. XX egg and Y sperm and where is non-disjunction in sperm, i.e. X egg and XY sperm.	
15	D. Sex -linked recessive	
16	C - The DNA strand that mRNA is built from is called the template strand and a transcription terminator is a section of nucleic acid sequence that marks the end of a gene or operon in genomic DNA during transcription	
17.	C. Nucleoside - A nucleoside consists of a nitrogenous base attached to a sugar(ribose or deoxyribose) with the help of a covalent bond	
18	B - The type of bond that holds the phosphate group to the sugar in DNA's backbone is called a phosphodiester bond.	
19	D. In Eukaryotes RNA polymerase I transcribe 28S,18S,5.8S rRNA.	
20	C. iii,i,ii and iv	
21	(a)	

	<p>A cross between pure breeding tall (TT) and dwarf (tt) plants produce all tall (Tt) plants in F1 progeny. These heterozygous tall plants produce 50% gametes with "T" allele and 50% with "t" allele. Random fusion of these gametes from two heterozygous tall plants gives tall and dwarf plants in 3:1 ratio. out of 3/4 tall plants; 1/4 are homozygous tall (TT) and 2/4 are heterozygous tall (Tt). This makes the genotypic ratio for F2 generation as 1 homozygous tall (TT): 2 heterozygous tall (Tt): 1 homozygous dwarf (tt).</p>	
22	<p>(D)</p> <p>Reproductive and Child Health (RCH) programme is a comprehensive sector wide flagship programme, under the umbrella of the Government of India's (GoI) National Health Mission (NHM), to deliver the RCH targets for reduction of maternal and infant mortality and total fertility rates.</p>	
23.	<p>(B.)</p> <p>Colourblindness is X-linked recessive disorder. Two copies of defective gene is required in females to cause colourblindness. Since father is colourblind, he will have genotype $X^c Y$. A normal visioned man will have genotype XY. A woman will have genotype either $X^C X^C$ or $X^C X$ as she received X^C chromosome from father. If man with genotype XY marries woman with genotype either $X^C X^C$ or $X^C X$, none of their daughter will be colourblind as she will receive one normal X chromosome from father.</p>	
24	<p>(C) –</p> <p>Gene – A gets transcribed into mRNA which produces β-galactoside permease b) Inducer-Repressor complex is formed</p>	
Section - B		
25	<p>(A)</p> <p>Mendel chose garden pea as plant material for his experiments, since it had the following advantages:</p> <p>(i) Well defined characters.</p> <p>(ii) Bisexual flowers.</p> <p>(iii) Predominantly self-fertilization.</p>	

	<p>(iv) Easy hybridization.</p> <p>Besides these features, garden pea, being self-fertilized, had pure lines due to natural self-fertilization for a number of years. Therefore, any variety used was pure for the characters it carried. Mendel's success was mainly based on the fact that he considered a single character at one time.</p>	
26	<p>(c)</p> <p>An allele is an alternative form of a gene one member of a pair that is located at a specific position on a specific chromosome. Diploid organisms, for example, humans, have paired homologous chromosomes in their somatic cells, and these contain two copies of each gene.</p>	
27	<p>(c)</p> <p>In the monohybrid test cross progeny both heterozygous and recessive individuals are obtained in 1 : 1 ratio.</p>	
28	<p>(c)</p> <p>Based on the destination of pollen grains, two types of pollination are recognised. When pollen grains are transferred from an anther to the stigma of the same flower the process is called self-pollination or autogamy. Cross-pollination is further classified depending on whether the pollination has occurred between two flowers on the same plant (geitonogamy) or between two flowers on different plants (xenogamy).</p>	
29	<p>(a)</p> <p>Cleistogamous flowers do not open at all thus ensuring fertilisation and hence produce assured seed-set even in the absence of pollinators.</p>	
30	<p>(d)</p> <p>It contains a non-steroidal preparation called centchroman, which is taken once in a week after an initial intake of twice a week dose for three months.</p>	
31	<p>(c)</p> <p>T nucleotide pair have 2 hydrogen bonds between the adenine and guanine, as compared to three hydrogen bonds between guanine and cytosine. A-T rich regions</p>	

	are present near the promoter region of DNA replication as DNA has to uncoil to start replication.	
32	(a) The backbone of each strand is made up of ribose sugar. These ribose sugars are connected with the help of a phosphodiester bond. ... The two strands of DNA made in this way, are held together in opposite or antiparallel directions with the help of hydrogen bonds. Hence, the correct answer is option (A).	
33	(b) Guides the pollen tube into a synergid	
34	(b) 7 - celled	
35	(a) Sepals and Petals	
36	(a) P. Maheshwari	
37	(b) ovule	
38	(d) Sporopollenin	
39	(B). (b) & (c) .(I) is Vegetative cell, (II) is Generative cell Generative cell produce 2 Male Gamete	
40	(c) I-b, II-d, III-a, IV-c	
41	(b) (i) -Antipodal cell, (ii)- Polar Nuclei, (iii) Egg Apparatus	
42	(c) (i)- Plasma membrane, (ii)- Acrosome, (iii)- Nucleus, (iv)-Mitochondria, (v)- Tail	
43	(b) Anemophily	
44	(a) Cortical reaction Explanation: After the entry of the sperm into the egg, the zona pellucida layer undergoes physical changes that prevent the entry of additional sperm. This reaction between zona pellucida is called thecortical reaction.	

45	(a) Menopause marks the end of a woman's fertility and the cease of the menstrual cycle. The ovaries stop producing hormones and in humans, the menstrual cycle ceases at around 50 years of age	
46	(a) a-4. b-1. c-2. d-5. e-3	
47	(c) Semi-discontinuous and Semi-conservative	
48	(b) Banana	
Section - C		
49	(c) - Steps in spermatogenesis (1) Spermatocytogenesis (mitotic phase) (2) Spermatidogenesis (meiotic phase) (3) Spermiogenesis and spermiation (differentiation phase)	
50	(b) FSH acts on the Sertoli cells and stimulate secretion of some factors which help in the process of spermatogenesis	
51	(a) The primary spermatocyte produces two secondary spermatocytes and the two secondary spermatocytes produces four haploid cells and four spermatozoa	
52	(d) spermatogonia → spermatocytes → spermatids → spermatozoa	
53	(d) Spermatozoa (sperm) are the male sex cells that carry a man's genetic material. Sperm are haploid cells, meaning they have half the number of chromosomes that other cells of the body	
54	(a) Growth of spermatogonia into primary spermatocyte. formation of spermatogonia from gonocytes through mitosis. formation of spermatids from primary spermatocytes through meiosis	
55	(C) - The function of non-sense codons is to terminate the message of a gene controlled protein synthesis. The three stop codons have been given names - UAG is amber, UGA is opal, and UAA is ochre	
56	(d) The lac operon can be defined as an Operon, or group of genes with a single promoter. The genes present in the operon encodes the proteins that allows the bacteria to process the lactose as an energy source	

57	(a) Down syndrome (trisomy 21) is a genetic disorder. It includes certain birth defects, learning problems, and facial features. A child with Down syndrome also may have heart defects and problems with vision and hearing	
58	(d) AUG codon codes for the methionine whereas GUG also functions as a start codon. These start codons always codes for the methionine and they are universal and codes for the same in both eukaryotes and prokaryotes.	
59	(C) - 12.5 % is the percentage of dwarf - white flowered offspring of above cross.	
60	(B) excreted in urine	