مـــدرسـة دلهـــي الخـاصـة ذ.م.م.
DELHI PRIVATE SCHOOL L.L.C.
Affiliated to C.B.S.E., DELHI
(Approved & Recognized By Ministry of Education - United Arab Emirates)
DPS SHARJAH

FT/BIQP/1221/A **28-SEP-2021**

FIRST TERM EXAMINATION (2021-22)

Subject: Biology **Max. Marks:35**

Grade: 12 **Time:90 min**

Name: **Section:** **Roll No:**

General Instructions:

- *This question paper consists of 9 printed pages.*
- *Answers to be bubbled in the OMR sheet provided.*
- *The Question Paper contains three sections.*
- *Section A has 24 questions. Attempt any 20 questions.*
- *Section B has 24 questions. Attempt any 20 questions.*
- *Section C has 12 questions. Attempt any 10 questions.*
- *All questions carry equal marks.*
- *There is no negative marking.*

SECTION-A

1. Which is the most common type of embryo sac in angiosperms?

a. Tetrasporic with one mitotic stage of divisions
b. Monosporic with three sequential mitotic divisions
c. Monosporic with two sequential mitotic divisions
d. Bisporic with two sequential mitotic divisions

2. Inner wall of pollen grain contains

a. cellulose
b. starch
c. pectin
d. Both (a) and (c)

3. Attractants and rewards are required for

a. entomophily
b. hydrophily
c. anemophily
d. cleistogamy

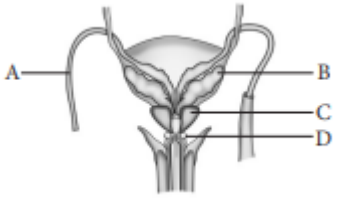
4. A dioecious flowering plant prevents both

a. autogamy and geitonogamy
b. geitonogamy and xenogamy
c. cleistogamy and xenogamy
d. autogamy and xenogamy.

5. What is the fate of the male gametes discharged in the synergid?

a. One fuses with the egg and other fuses with central cell nuclei.
b. One fuses with the egg, other(s) degenerates in the synergid
c. All fuse with the egg.
d. One fuses with the egg, other(s) fuse(s) with synergid nucleus.

6. Given below is a diagrammatic sketch of a portion of human male reproductive system. Select the correct set of the names of the parts labelled A, B, C, D.



a. A-Vas deferens, B-Seminal vesicle, C-Prostate, D-Bulbourethral gland
b. A-Vas deferens, B-Seminal vesicle, C-Bulbourethral gland, D-Prostate
c. A-Ureter, B-Seminal vesicle, C-Prostate, D-Bulbourethral gland
d. A-Ureter, B-Prostate, C-Seminal vesicle, D-Bulbourethral gland

7. The part of Fallopian tube closest to the ovary is
a. isthmus
b. infundibulum
c. cervix
d. ampulla.

8. Meiotic division of the secondary oocyte is completed
a. prior to ovulation
b. at the time of copulation
c. after zygote formation
d. at the time of fusion of a sperm with an ovum

9. The difference between spermiogenesis and spermiation is
a. in spermiogenesis spermatids are formed, while in spermiation spermatozoa are formed
b. in spermiogenesis spermatozoa are formed, while in spermiation spermatids are formed
c. in spermiogenesis spermatozoa from Sertoli cells are released into the cavity of seminiferous tubules, while in spermiation spermatozoa are formed
d. in spermiogenesis spermatozoa are formed, while in spermiation spermatozoa are released from Sertoli cells into the cavity of seminiferous tubules.

10. What does the filiform apparatus do at the entrance into ovule?
a. It brings about opening of the pollen tube.
b. It guides pollen tube from a synergid to egg.
c. It helps in the entry of pollen tube into a synergid.
d. It prevents entry of more than one pollen tube into the embryo sac.

11. The arrangement of the nuclei in a normal embryo sac in the dicot plants is
a. 3 + 3 +2
b. 2 + 4 + 2
c. 3 + 2 + 3
d. 2 + 3 + 3.

12. F2 generation in a Mendelian cross showed that both genotypic and phenotypic ratios are same as 1 : 2 : 1. It represents a case of
a. co-dominance
b. dihybrid cross
c. monohybrid cross with complete dominance
d. monohybrid cross with incomplete dominance.

13. ABO blood groups in humans are controlled by the gene I. It has three alleles - IA, IB and i. Since there are three different alleles, six different genotypes are possible. How many phenotypes can occur?
a. Three
b. One
c. Four
d. Two

14. Due to the cross between TTRr × ttrr the resultant progenies show what percent of tall, red flowered plants

a. 50% **b.** 75%

c. 25% **d.** 100%

15. A man with blood group 'A' marries a woman with blood group 'B'. What are all the possible blood groups of their offspring?

a. A, B, AB and O **b.** O only

c. A and B only **d.** A, B and AB only

16. Which one of the following cannot be explained based on Mendel's law of dominance?

a. The discrete unit controlling a particular character is called a factor **b.** Out of one pair of factors one is dominant, and the other recessive

c. Alleles do not show any blending and both the characters recover as such in F2 generation **d.** Factors occur in pairs.

17. In human beings, multiple genes are involved in the inheritance of

a. sickle-cell anaemia **b.** skin colour

c. colour blindness **d.** phenylketonuria.

18. The 3′ - 5′ phosphodiester linkages inside a polynucleotide chain serve to join

a. one DNA strand with the other DNA strand **b.** one nucleoside with another nucleoside

c. one nucleotide with another nucleotide **d.** one nitrogenous base with pentose sugar.

19. In sea urchin DNA, which is double stranded, 17% of the bases were shown to be cytosine. The percentages of the other three bases expected to be present in this DNA are

a. G =17%, A= 33%, T= 33% **b.** G= 8.5%, A= 50%, T= 24.5

c. G =34%, A =24.5%, T= 24.5% **d.** G =17%, A= 16.5%, T=32.5%.

20. What will be the sequence of mRNA produced by the following stretch of DNA?
3′ATGCATGCATGCATG5′TEMPLATE STRAND
5′ TACGTACGTACGTAC3′ CODING STRAND

a. 3′AUGCAUGCAUGCAUG5 **b.** 3′ UACGUACGUACGUAC 5′

c. 5′UACGUACGUACGUAC 3′ **d.** 5′ AUGCAUGCAUGCAUG 3′

21. In negative operon,

a. Inducer binds with repressor **b.** co-repressor does not bind with repressor

c. co-repressor binds with inducer **d.** cAMP have negative effect on lac operon.

22. Nucleosome core is made of

a. H0, H2A, H2B and H3 **b.** H1, H2A, H2B, H4

c. H1, H2A, H2B, H3 and H4 **d.** H2A, H2B, H3 and H4.

23. In the DNA molecule,

a. the proportion of adenine in relation to thymine varies with the organism **b.** there are two strands which run antiparallel-one in 5′ → 3′ direction and other in 3′ → 5′

c. the total amount of purine nucleotides and pyrimidine nucleotides is not always equal **d.** there are two strands which run parallel in the 5′ → 3′ direction

24. Which one of the following pairs of codons is correctly matched with their function or the signal for the particular amino acid?

a. GUU, GCU-Alanine **b.** UAG, UGA-Stop

c. AUG, ACG-Start/methionine **d.** UUA, UCA-Leucine

SECTION - B

Section - B consists of 24 questions (Q No.25 to 48). Attempt any 20 questions from this section. The first attempted 20 questions would be evaluated.

Question No. 25 to 28 consist of two statements – Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:

25. Assertion: Colostrum produced in first 2-3 days after parturition is rich in nutrients.
Reason: Placenta induces the signals for expulsion of the fully developed.

a. Both A and R are true, and R is the correct explanation of A.
b. Both A and R are true, and R is not the correct explanation of A
c. A is true but R is false
d. A is False but R is true

26. **Assertion:** In the testes, spermatogenesis occurs in the seminiferous tubules and testosterone secretion takes place in the interstitial cells.
Reason: Testosterone brings about growth and maturation of secondary sex organs and also development of accessory sex characters.

a. Both A and R are true, and R is the correct explanation of A.
b. Both A and R are true, and R is not the correct explanation of A
c. A is true but R is false
d. A is False but R is true

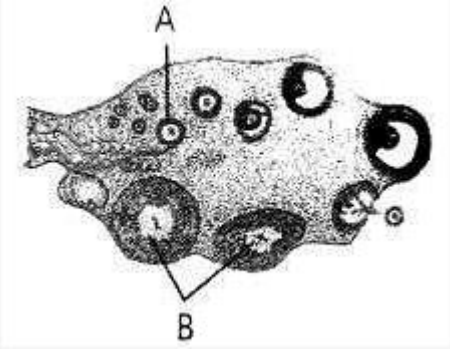
27. **Assertion:** Rapid decline in death rate, MMR and IMR have led to a staggering rise in population.
Reason: Such an alarming growth rate has led to an absolute scarcity of even the most basic requirements, i.e., food and shelter.

a. Both A and R are true, and R is the correct explanation of A.
b. Both A and R are true, and R is not the correct explanation of A
c. A is true but R is false
d. A is False but R is true

28. Assertion: Hybrids are generally back crossed.
Reason: Back cross is done to increase the traits of the parent.

a. Both A and R are true, and R is the correct explanation of A.
b. Both A and R are true, and R is not the correct explanation of A
c. A is true but R is false
d. A is False but R is true

29. The figure shows a section of human ovary. Select the option which gives the correct identification of either A or B with function /characteristic.



a. B- Corpus luteum - Secretes progesterone
b. A- Tertiary follicle - Forms Graafian follicle
c. B- Corpus luteum - Secretes estrogen
c. A- Primary oocyte - It is in the prophase I of the meiotic division

30. Which one of the following statements is not true?

a. The flowers pollinated by flies and bats
b. Honey is made by bees by digesting

secrete foul odour to attract them

c. Pollen grains are rich in nutrients, and they are used in the form of tablets and syrups

d. Pollen grains of some plants cause severe allergies and bronchial afflictions in some people

31. Which one of the following may require pollinators, but is genetically similar to autogamy?

a. Apogamy **b.** Cleistogamy

c. Geitonogamy **d.** Xenogamy

32. Which of the following hormone levels will cause release of ovum (ovulation) from the Graffian follicle?

a. High concentration of Estrogen **b.** High concentration of Progesterone

c. Low concentration of LH **d.** Low concentration of FSH

33. Select the hormone-releasing Intra-Uterine Devices.

a. Lippes Loop, Multiload 375 **b.** Vaults, LNG-20

c. Multiload 375, Progestasert **d.** Progestasert, LNG-20

34. In which of the following techniques, the embryos are transferred to assist those females who cannot conceive?

a. ZIFT and IUT **b.** GIFT and ZIFT

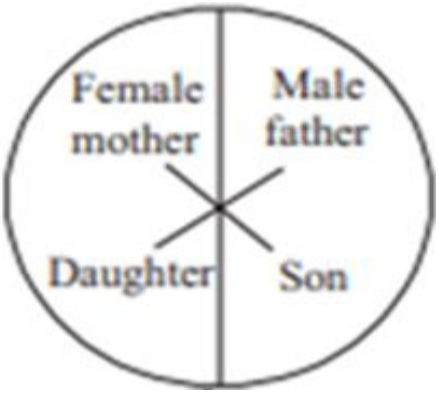
c. ICSI and ZIFT **d.** GIFT and ICSI

35. In vitro fertilization is a technique that involves transfer of which one of the following into the fallopian tube?

a. Embryo only, upto 8 cell stage **b.** Either zygote or early embryo upto 8 cell stages

c. Embryo of 32 cell stage **d.** Zygote only

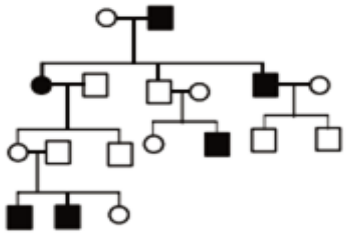
36. Represented here is the inheritance pattern of a certain type of trait in humans. Which one of the following conditions could be an example of this pattern?



a. Phenylketonuria **b.** Sickle cell anaemia

c. Haemophilia **d.** Thalassemia

37. In the following human pedigree, the filled symbols represent the affected individuals. Identify the type of given pedigree.



a. Autosomal dominant
b. Autosomal recessive
c. X- linked dominant
d. X- linked recessive

38. In Drosophila, the XXY condition leads to femaleness whereas in human beings the same condition leads to Klinefelter's syndrome in male. It proves

a. In human beings Y chromosome is active in sex determination
b. Y chromosome is active in sex determination in both human beings and Drosophila
c. in Drosophila Y chromosome decides femaleness
d. Y chromosome of man have genes for syndrome

39. In a plant, red fruit (R) is dominant over yellow fruit (r) and tallness (T) is dominant over shortness (t). If a plant with RRTt genotype is crossed with a plant that is rrtt,

a. 25% will be tall with red fruit
b. 50% will be tall with red fruit
c. 75% will be tall with red fruit
d. all the offspring will be tall with red fruit

40. A normal-visioned man whose father was colour blind, marries a woman whose father was also colour-blind. They have their first child as a daughter. What are the chances that this child would be colour-blind?

a. 100%
b. Zero%
c. 25%
d. 50%

41. Lack of independent assortment of two genes A and B in fruit fly Drosophila is due to

a. repulsion
b. recombination
c. linkage
d. crossing over.

42. The following ratio is generally constant for a given species:

a. A + G/C + T
b. T + C/G + A
c. G + C/A + T
d. A + C/T + G

43. An environmental agent, which triggers transcription from an operon, is a

a. depressor
b. controlling element
c. regulator
d. inducer

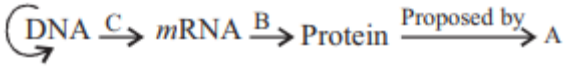
44. Which of the following step of translation does not consume a high energy phosphate bond?

a. Peptidyl transferase reaction
b. Aminoacyl tRNA binding to A-site
c. Translocation
d. Amino acid activation

45. Genetic code consists of

a. adenine and guanine
b. cytosine and uracil
c. cytosine and guanine
d. all of these.

46.



The figure gives an important concept in the genetic implication of DNA. Fill the blanks A, B and C.

a. A-Maurice Wilkins, B-Transcription, C-Translation
b. A-James Watson, B-Replication, C-Extension
c. A-Erwin Chargaff, B-Translation, C-Replication
d. A-Francis Crick, B-Translation, C-Transcription

47. Consider the following statements and choose the correct option.
In eukaryotes

(i) RNA polymerase I transcribes rRNA.

(ii) RNA polymerase I transcribes snRNA.

(iii) RNA polymerases II transcribes tRNA.

(iv) RNA polymerase II transcribes hnRNA.

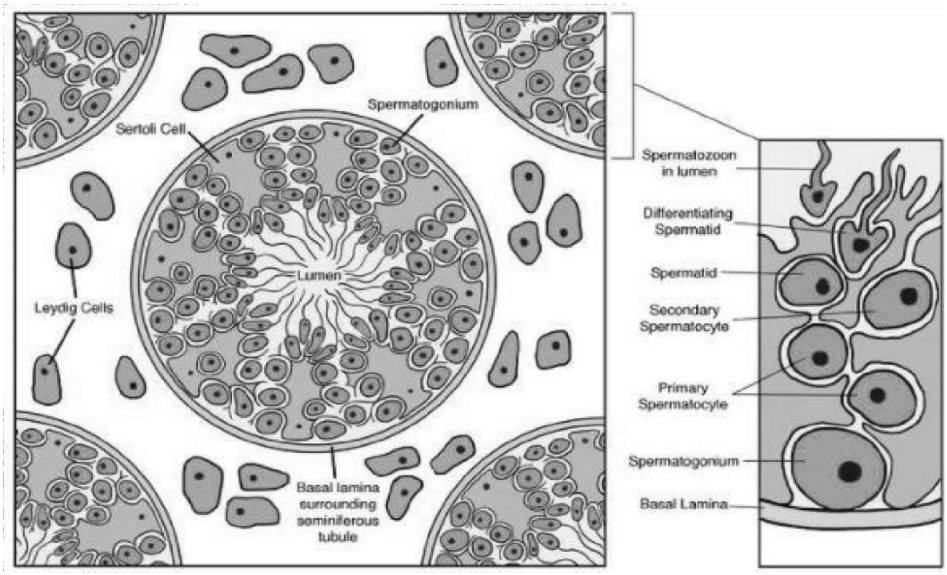
a. 1 & 2 are correct
1 & 3 are correct
c. 1 ,2 & 4 are correct
2 & 3 are correct

48. Gene and cistron words are sometimes used synonymously because
a. one cistron contains many genes
b. one gene contains many cistrons
c. one gene contains one cistron
d. one gene contains no cistron

SECTION - C

Section-C consists of one case followed by 6 questions linked to this case (Q.No.49 to 54). Besides this, 6 more questions are given. Attempt any 10 questions in this section.
The first attempted 10 questions would be evaluated.

Case Study the graph given and answer the questions



49. The function of Sertoli cell is:
a. Nutrition to the sperms
b. Nutrition to the Leydig cells
c. Nutrition to the basal lamina
d. Excretion from sperm

50. Cross section of testes shows:
a. Seminiferous tubules with different stages of development of sperm
Development of Sertoli cells
c. Many testicular lobules
Many spermatogonia Ans. a

51. Pick out and name the cells that undergo spermiogenesis
a. Spermatogonia undergo spermiogenesis
b. Spermatids undergo spermiogenesis
c. Secondary spermatocytes undergo spermiogenesis
d. Primary spermatocytes undergo spermiogenesis.

52. How many sperms will be produced from 50 primary spermatocytes?

a. 400 sperms
1000 sperms
c. 200 sperms
100 sperms

53. Testosterone is secreted by which cell:

a. Sertoli cell
b. Spermatids
c. Leydig cells
d. Spermatogonia

54. How many sperms are formed from a secondary spermatocyte?

a. 4
b. 8
c. 2
d. 1

55. In human beings 45 chromosomes/single X/XO abnormality causes

a. Down's syndrome
b. Klinefelter's syndrome
c. Turner's syndrome
d. Edward's syndrome

56. There are three genes a, b, c. Percentage of crossing over between a and b is 20%, b and c is 28% and a and c is 8%. What is the sequence of genes on chromosome?

a. b, a, c
b. a, b, c
c. a, c, b
d. None of these

57. Select the incorrect statement with regard to hemophilia.

a. It is a dominant disease.
b. A single protein involved in the clotting of blood is affected.
c. It is a sex-linked disease.
d. It is a recessive disease

58. Under which of the following conditions there will be no change in the reading frame of following mRNA?

5' AACAGCGGUGCUAUU 3'

a. Deletion of GGU from 7th, 8th and 9th positions
b. Insertion of G at 5th position
c. Deletion of G from 5th position
d. Insertion of A and G at 4th and 5th position respectively

59. In mutational event, when adenine is replaced by guanine, it is a case of

a. frame shift mutation
b. transcription
c. transition
d. transversion.

60. Which of the following forms the basis of DNA fingerprinting?

a. The relative proportions of purines and pyrimidines in DNA
b. The relative difference in the DNA occurrence in blood, skin and saliva.
c. The relative amount of DNA in the ridges and grooves of the fingerprints.
d. Satellite DNA occurring as highly repeated short DNA segments.

***