مـــدرسـة دلهـي 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

PB-T1/BIQP/1221/B **08-NOV-2021**

PREBOARD EXAMINATION - (2021-22)
TERM I-SET B

Subject: BIOLOGY **Max. Marks:35**
Grade: XII **Time: 90 Mins**

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. Function of germ pore is:
a. Emergence of radicle **b.** Absorption of water for seed germination
c. Initiation of pollen tube **d.** Release of male gametes

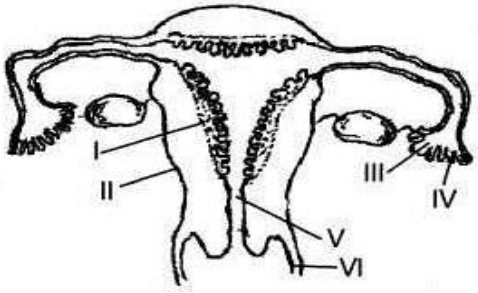
2. Pollination in water hyacinth and water lily is brought about by the agency of
a. water **b.** insects or wind
c. birds **d.** bats

3. What is the direction of micropyle in anatropous ovule?
a. Upward **b.** Downward
c. Right **d.** Left

4. Non-albuminous seed is produced in
a. maize **b.** castor
c. wheat **d.** Pea

5. If there are 8 cells in anthers, what will be the number of pollen grains?
a. 32 **b.** 24
c. 16 **d.** 8

6. The figure given below depicts a diagrammatic sectional view of the human female reproductive system.



a. (II) endometrium, (III) infundibulum, (IV) fimbriae
b. (III) infundibulum, (IV) fimbriae, (V) cervix
c. (IV) oviducal funnel, (V) uterus, (VI) cervix
d. (I) perimetrium, (II) myometrium, (III) Fallopian tube

7. No new follicles develop in the luteal phase of the menstrual cycle because
a. Follicles do not remain in the ovary after ovulation
b. FSH levels are high in the luteal phase
c. LH levels are high in the luteal phase
d. Both FSH and LH levels are low in the luteal phase

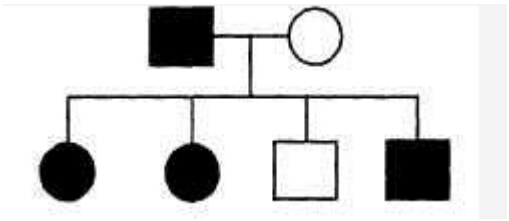
8. Vasa efferentia are the ductules leading from
a. testicular lobules to rete testis
b. rete testis to vas deferens
c. vas deferens to epididymis
d. epididymis to urethra

9. Select the correct option describing gonadotropin activity in a normal pregnant female.
a. High level of FSH and LH stimulates the thickening of endometrium.
b. High level of FSH and LH facilitates implantation of the embryo.
c. High level of hCG stimulates the synthesis of estrogen and progesterone.
d. High level of hCG stimulates the thickening of endometrium.

10. When a diploid female plant is crossed with a tetraploid male, the ploidy of endosperm cells in the resulting seed is
a. Tetraploidy
b. Pentaploidy
c. Diploidy
d. Triploidy

11. Perisperm differs from endosperm in
a. being a diploid tissue
b. its formation by fusion of secondary nucleus with several sperms
c. being a haploid tissue
d. having no reserve food

12. Study the pedigree chart of a certain family given below and select the correct conclusion which can be drawn for the character.



a. The female parent is heterozygous.
b. The parents could not have had a normal daughter for this character.
c. The trait under study could not be colour blindness.
d. The male parent is homozygous dominant

13. The genotypes of a husband and wife are I^AI^B and I^Ai;
Among the blood types of their children, how many different genotypes and phenotypes are possible?
a. 3 genotypes; 4 phenotypes
b. 4 genotypes; 3 phenotypes
c. 4 genotypes; 4 phenotypes
d. 3 genotypes; 3 phenotypes

14. Haemophilic man marries a normal woman. Their offspring will be
a. all haemophilic
b. all boys haemophilic
c. all girls haemophilic
d. all normal

15. A male human is heterozygous for autosomal genes A and B and is also hemizygous for haemophilic gene h. What proportion of his sperms will be abh?

a. 1/8 **b.** 1/32

c. 1/16 **d.** 1/4

16. How many kinds of gametes will be produced by a plant having the genotype AABbCC?

a. Two **b.** Three

c. Four **d.** Nine

17. A human male produces sperms with the genotypes AB, Ab, aB and ab pertaining to two diallelic characters in equal proportions. What is the corresponding genotype of this person?

a. AaBB **b.** AABb

c. AABB **d.** AaBb

18. 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

19. Which of the following statements is not true of two genes that show 50% recombination frequency?

a. The gene show independent assortment. **b.** If the genes are present on the same chromosome, they undergo more than one cross overs in every meiosis.

c. The genes may be on different chromosomes. **d.** The genes are tightly linked.

20. Select the correct option.

	Direction of RNA synthesis	Direction of reading of the template DNA strand
(A)	5' –3'	3' –5'
(B)	3' –5'	5' –3'
(C)	5' –3'	5' –3'
(D)	3' –5'	3' –5'

a. A **b.** B

c. C **d.** D

21. In an inducible operon, the genes are

a. usually not expressed unless a signal turns them "on" **b.** usually expressed unless a signal turns them "off"

c. never expressed **d.** always expresser

22. Escherichia coli fully labelled with 15N is allowed to grow in 14N medium. The two strands of DNA molecule of the first-generation bacteria have

a. different density and do not resemble parent DNA **b.** different density but resemble parent DNA

c. same density and resemble parent DNA **d.** same density but do not resemble parent DNA

23. Match the following genes of the Lac operon with their respective products.

(A) i gene (i) β galactosidase

(B) z gene (ii) Permease

(C) a gene (iii) Repressor

(D) y gene (iv) Transacetylase

Select the correct option.

a. A-(iii), B-(iv), C-(i), D-(ii)
b. A-(i), B-(iii), C-(ii), D-(iv)
c. A-(iii), B-(i), C-(ii), D-(iv)
d. A-(iii), B-(i), C-(iv), D-(ii)

24. Using imprints from a plate with complete medium and carrying bacterial colonies, you can select streptomycin resistant mutants and prove that such mutations do not originate as adaptation. These imprints need to be used

a. on plates with and without streptomycin
b. on plates with minimal medium
c. only on plates with streptomycin
d. only on plates without streptomycin.

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**: Test-tube baby has raised several legal problems.
Reason: It involves in vitro fertilization followed by embryo transfer.

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**: Use of condom is a protection against AIDS and sexual diseases besides checking pregnancy
Reason: Certain contraceptives are planted under the skin of the upper arm to prevent pregnancy

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

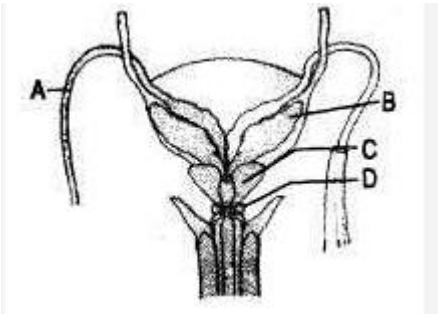
27. **Assertion:** Vigorous contraction of the uterus at the end of pregnancy causes expulsion
Reason: The stimulatory reflex between the uterine contraction and oxytocin results in weakening contractions.

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**: On true breeding lines, Mendel conducted cross pollination experiments
Reason: For several generations, true breed line has stable trait inheritance.

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. Given below is a diagrammatic sketch of a portion of human male reproductive system.



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

c. A-Ureter, B-Prostate, C-Seminal vesicle, D-Bulbourethral gland

30. The ovule of an angiosperm is technically equivalent to

a. Megasporangium **b.** Megasporophyll

c. Megaspore mother cell **d.** Megaspore

31. Number of meiotic divisions required to produce 200/400 seeds of pea would be

a. 200/400 **b.** 400/800

c. 300/600 **d.** 250/500

32. The first movements of the foetus and appearance of hair on its head are usually observed during which month of pregnancy?

a. Fourth month **b.** Fifth month

c. Sixth month **d.** Third month

33. What is the work of progesterone which is present in oral contraceptive pills?

a. To inhibit ovulation **b.** To check oogenesis

c. To check entry of sperms into cervix and to make them inactive **d.** To check sexual behaviour

34. Consider the statements given below regarding contraception and answer as directed thereafter.

(1) Medical termination of pregnancy (MTP) during first trimester is generally safe.

(2) Generally, chances of conception are nil until mother breast-feeds the infant up to two years.

(3) Intrauterine devices like copper-T are effective contraceptives.

(4) Contraception pills may be taken up to one week after coitus to prevent conception.

Which two of the above statements are correct?

a. 1, 3 **b.** 1, 2

c. 2, 3 **d.** 3, 4

35. Which one of the following fruits is parthenocarpic?

a. Jackfruit **b.** Banana

c. Brinjal **d.** Apple

36. 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

37. Which of the following statements indicates the Parallelism in Genes and Chromosomes?

I) They occur in pairs

II) They segregate during the gamete formation

III) They show linkage

IV) The independent pairs segregate independently

a. (I) and (III) **b.** (II) and (III)

c. (I), (III) and (III) **d.** (I), (II) and (IV)

38. If the maternal grandfather of a boy is haemophilic, maternal grandmother is normal and father is normal then what are the chances that he could have haemophilia disease?

a. 25% **b.** 50%

c. 75% **d.** 0%

39. One of the parents of a cross has a mutation in its mitochondria. In that cross, that parent is taken as a male. During segregation of F2 progenies that mutation is found in

a. one-third of the progenies
b. none of the progenies
c. all the progenies
d. fifty percent of the progenies

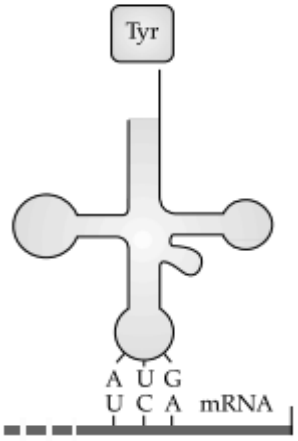
40. In pea plants, yellow seeds are dominant to green. If a heterozygous yellow seeded plant is crossed with a green seeded plant, what ratio of yellow and green seeded plants would you expect in F1 generation?
a. 9: 1
b. 1: 3
c. 3: 1
d. 50: 50

41. Of a normal couple, half the sons are hemophilic while half the daughters are carriers. The gene is located on
a. X-chromosome of father
b. Y-chromosome of father
c. one X-chromosome of mother
d. both the X-chromosomes of mother

42. 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

43. Whose experiments cracked the DNA and discovered unequivocally that a genetic code is a "triplet"?
a. Hershey and Chase
b. Morgan and Sturtevant
c. Beadle and Tatum
d. Nirenberg and Mathaei

44. Amino acid is carried by tRNA at its –



a. 3'End
b. 5'End
c. DHU Loop
d. Anticodon loop

45. DNA finger printing is a technique in molecular biology. Arrange the following steps in sequence.
1) Blotting of DNA fragment to nitro cellulose.
2) Digestion of DNA by restriction endonuclease.
3) Detection of hybridized DNA by autoradiography.
4)Isolation of DNA,
5) separation of DNA fragments by electrophoresis.
a. 4 2 1 5 3
b. 4 2 5 1 3
c. 3 1 4 5 2
d. 2 4 1 5 2

46. Select the correct statement.
a. Franklin Stahl coined the term "linkage".
b. Punnett square was developed by a British scientist.
c. Spliceosomes take part in translation.
d. Transduction was discovered by S. Altman.

47. Arrange the following events in the order of synthesis of a protein

i) A peptide bond forms

ii) A tRNA matches its anticodon to the codon in the A- site

iii) The movement of second tRNA complex from A-site to P-site

iv) The large subunit attaches to the small subunit and the initiator tRNA fits in the P-site

v) A small subunit binds to the mRNA

vi) The activated amino acid tRNA complex attaches the initiation codon on mRNA

a. iv, v, iii, ii, i, vi **b.** iv, vi, v, ii, i, iii

c. v, iv, iii, ii, vi, i **d.** v, vi, iv, ii, i, iii

48. Nucleotide arrangement in DNA can be seen by

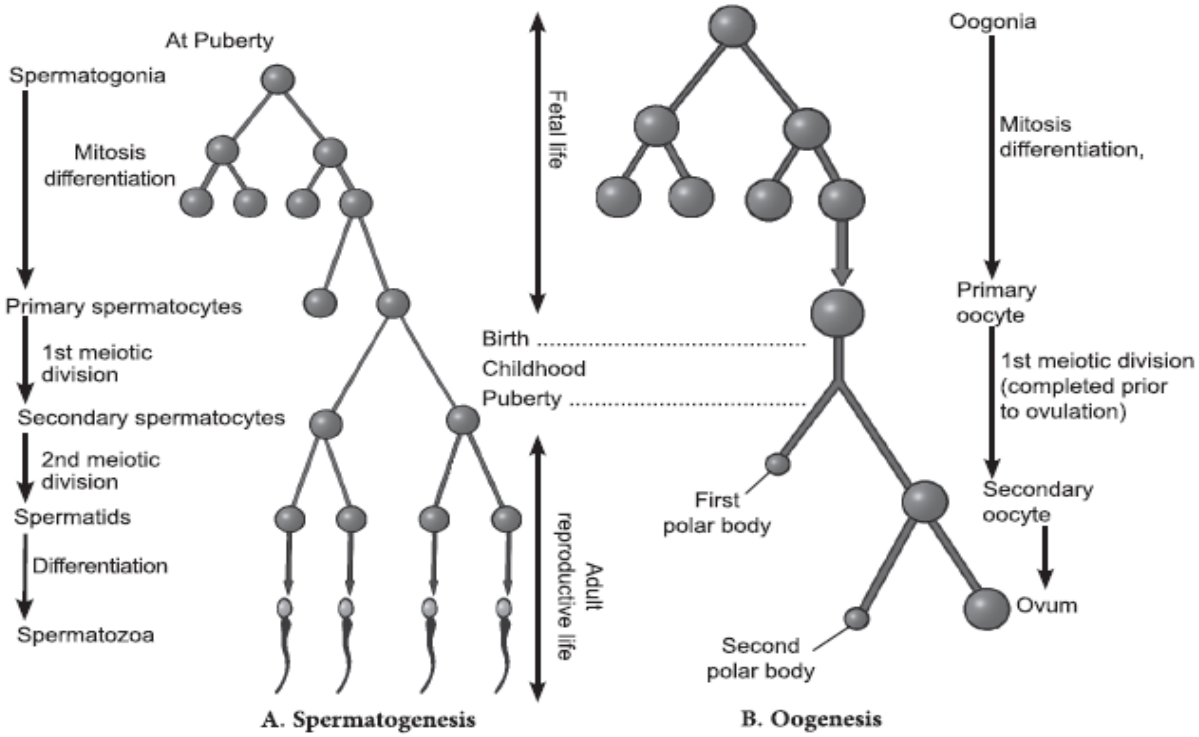
a. X-ray crystallography **b.** electron microscope

c. ultracentrifuge **d.** light microscope

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 Observe the schematic representation of A-Spermatogenesis, B-Oogenesis and answer the questions that follow.



49. The two processes, spermatogenesis in human males and oogenesis in human females, start respectively at

a. Puberty in both **b.** Puberty and foetal stage

c. Embryonic stage and puberty **d.** Embryonic/foetal stage in both

50. How many primary oocytes are involved in the production of 100 ova in a human female?

a. 25 **b.** 50

c. 100 **d.** 200

51. How many spermatids are formed from 100 primary spermatocytes?

a. 100 **b.** 200

c. 400 **d.** 800

52. How many chromatids are present in each of (A) the spermatids and (B) the first polar body?

a. A-23, B-46 **b.** A-46, B-23

c. A-46, B-46 **d.** A-23, B-23

53. What is the ratio between the number of spermatozoa and the number of ova, produced by one primary spermatocyte and one primary oocyte, respectively?

a. 1:1 **b.** 1:2

c. 2:1 **d.** 4:1

54. The pituitary hormones which influence spermatogenesis at puberty are:

a. Gonadotropin-releasing hormone and follicle stimulating hormone **b.** Follicle stimulating hormone and luteinizing hormone

c. Luteinizing hormone and gonadotropin releasing hormone **d.** Testosterone and Follicle stimulating hormone

55. A man and a woman, who do not show any apparent signs of a certain inherited disease, have seven children (2 daughters and 5 sons). Three of the sons suffer from the given disease but none of the daughters affected. Which of the following mode of inheritance do you suggest for this disease?

a. Sex-linked dominant **b.** Sex-linked recessive

c. Sex-limited recessive **d.** Autosomal dominant

56. Which one of the following conditions correctly describes the manner of determining the sex?

a. Homozygous sex chromosomes (ZZ) determine female sex in birds. **b.** XO type of sex chromosomes determine male sex in grasshopper

c. XO condition in humans as found in Turner's syndrome, determines female sex. **d.** Homozygous sex chromosomes (XX) produce male in Drosophila

57. Down's syndrome is caused by an extra copy of chromosome number 21. What percentage of offspring produced by an affected mother and a normal father would be affected by this disorder?

a. 100% **b.** 75%

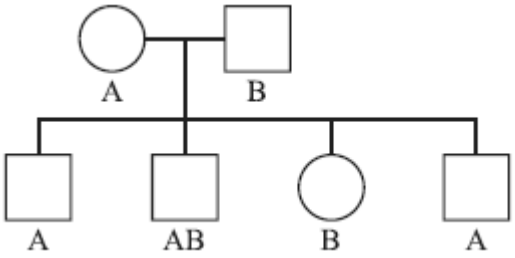
c. 50% **d.** 20%

58. Which of the following is correctly matched

a. RNA polymerase I- 18S rRNA **b.** RNA Polymerase II-snRNAs

c. RNA polymerase III-hnRNA **d.** RNA polymerase II-5S rRNA

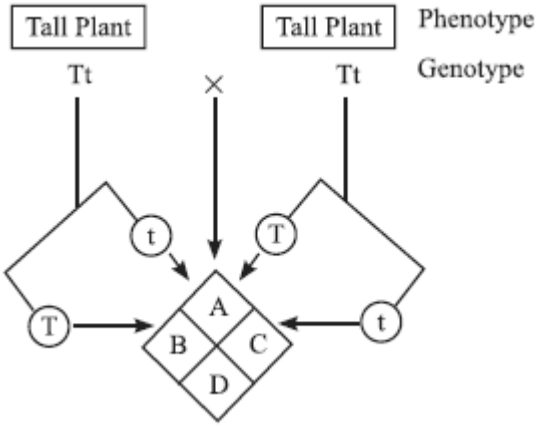
59. The pedigree chart given below shows the inheritance of blood group character in a family. The genotypes of the parents must be



a. I^Ai and I^Bi **b.** I^AI^A and I^Bi

c. I^Ai and I^BI^B **d.** I^AI^A and I^BI^B

60. A cross between two tall pea plants is represented below. Which two of the four boxes A-D have the same genotype?



a. A and B
b. A and D
c. A and C
d. B and D

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