Allenhouse PUBLIC SCHOOL
Khalasi Lines, Kanpur
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TERM -1 PREBOARD (2021-22)

Class : XII
Subject : BIOLOGY (044)
Exam Date : 28.10.2021

TEST BOOKLET CODE (A)

Name : _____ Sec : _____ Roll No. _____

Time : 90 minutes **M.M. : 40**

General Instructions :-

- *The question paper has 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.*
- *These is no negative marking.*
- *In case more than desirable number of questions are attempted, only the first required no. of questions will be checked and remaining will be cancelled.*

Section A

(Section-A has 1 to 24 questions. Attempt any 20 questions)

1. Read the following statements and identify the correct statements about the generative cell of a pollen grain. Choose the option containing all correct statements.

   A. Generative cell is irregular in shape.
   B. It has a dense cytoplasm and a nucleus.
   C. It has abundant food reserves.
   D. It is spindle shaped.
   E. It floats in the cytoplasm of the vegetative cell.
   F. It undergoes meiosis to form two male gametes

   a) A, B and D
   b) B,D and E
   c) A,B and E
   d) B, D and F

2. Which of the following set contains part of an ovule only?
   a) funicle, raphe, integuments and thalamus.
   b) funicle, hilum, integuments and nucellus.
   c) raphe, integuments, style and funiculus.
   d) hilum, integuments, nucellus and style

3. Which of the following groups contains all cells that are haploid ?
   a) Pollen grain, megaspore and zygote
   b) Nucellus, megaspore mother cell, and synergids
   c) Microspore mother cell, megaspore mother cell and synergids.
   d) Microspore, megaspore and antipodals

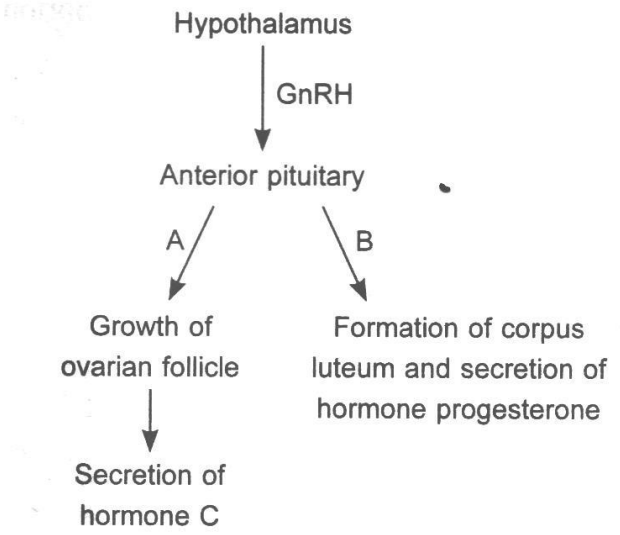
4. Match the terms in Column 1 with column 2 and select the correct options

COLUMN 1	COLUMN 2
(A) Pericarp	1. Cotyledons in the seeds
(B) Pollen grains Of Vallisnaria	2. Remnants of nucellus in seeds of black pepper
(C) perisperm	3. Mucilaginous covering
(D) Scutellum	4. Wall of the true fruit wall

   a) A=3, B=4, C=2, D=1
   b) A=4, B=3, C=2, D=1
   c) A=3, B=4, C=1, D=2
   d) A=2, B=3, C=4, B=1

5. The function of trophoblast in a human blastocysts, is the
   a. formation of placenta
   b. formation of ectoderm
   c. Protection of embryo
   d. Formation of endoderm

6. Identify the hormones A, B and C In the flowchart given below :-



a. A. Luteinising Hormone
   B. Follicle Stimulating Hormone
   C. Estrogen

b. A. Follicle Stimulating Hormone
   B. Luteinising Hormone
   C. Estrogen

c. A. Follicle Stimulating Hormone
   B. Luteinising Hormone
   C. Relaxin

d. A. Luteinising Hormone
   B. Follicle Stimulating Hormone
   C. Relaxin

7. Which among the following is a copper – ion releasing intra-uterine device?
   a. Progestrasert
   b. multiload375
   c. Lippes loop
   d. LNG-20

8. Identify whether each of the following statements is true or false and select the correct options
   A. contraceptive pills prevent ovulation and implantation. (T/F)
   B . MTPs are considered relatively safe during the first 18 weeks. (T/F)
   C. sterilization process in males is called vasectomy, and that in female is called tubectomy. (T/F)
   D. Saheli is an important oral pill. (T/F)

   a. A-T, B-F, C-F, D-T
   b. A-T, B-F, C-T, D-F
   c. A-F, B-F, C-T, D-F
   d. A-T, B-F, C-F, D-F

9. Which of the following is constant for a species?
   a. A+C/T+G
   b. A + T / G +C
   c. A + G / C +T
   d. A + G/ T + C

10. Conditions of a karyotype 2n+-1 and 2n + - 2 are called :
   a. ANEUPLOIDY
   b. POLYPLOIDY
   c. ALLOPOLYPLOIDY.
   d. MONOSOMY

11. Occasionally , a single gene may express more than one effect. The phenomenon is called :
   a. multiple allelism
   b. mosaicism
   c. pleiotropy
   d. polygeny

12. Which of the following is correctly matched
   a. RNA polymerase I – 18S r RNA
   b. RNA polymerase II –sn RNAs
   c. RNA polymerase III – hnRNA
   d. RNA polymerase II- 5sr RNA

13. Lac operon gets induced when
   a. repressor binds to the operator
   b. lactose binds to the operator
   c. lactose binds to the repressor
   d. repressor binds to the promoter

14. Which of the following statements is correct?
   a. Exons are present in m-RNA and introns in t-RNA.
   b. Codons are present in mRNA and anticodons in t-RNA.
   c. An intron is a segment of DNA that code for a polypeptide.
   d. Exons are removed and introns are joined during splicing

15. A Woman has a haemophilic son and two normal daughters . Her genotype and of her husband for his characters would be:
   a. XX and X^h Y
   b. XX^h and X^hY
   c. $X^h X^h$ and XY
   d. XX^h and XY

16. Match the items of columns 1 with those in column 2 and select the correct option.

COLUMN 1	COLUMN 2
A. ABO Blood group in humans	1. Polygenic inheritance
B. Flower colour in snapdragon.	2. Mendelian genetic disorder
C. Human skin colour	3. Sex linked Mendelian disorder
D. Phenylketonuria	4. Incomplete dominance
	5. Multiple allelism

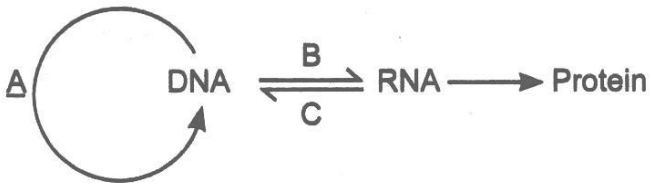
   a. A-3,B-4,C-1,D-5
   b. A-4,B-3,C-1,D-4
   c. A-5,B-4,C-1,D-2
   d. A-4,B-5,C-1,D-2

17. **Match the columns and select the correct options**

	COLUMN 1		COLUMN 2
A.	Homozygous violet	1.	tt
B.	Test cross	2.	AA x aa
C.	Monohybrid cross	3.	Tt
D.	Homozygous recessive	4.	VV
		5.	Tt x tt

a. A-4, B-5, C-2, D-1
b. A-4,B- 5, C-1, D-2
c. A-4, B-2, C-5, D-1
d. A-4, B-3, C- 2, D-1

18. Identify the enzymes A,B and C in the flow chart of central dogma of molecular biology and select the correct options.



a. A-DNA dependant DNA polymerase
B- DNA-dependant RNA -polymerase
C- RNA – dependant DNA -Polymerase

b. A-DNA dependant DNA polymerase
B- DNA dependant RNA polymerase
C- DNA dependant DNA Polymerase

c. A-DNA dependant DNA polymerase
B- RNA dependant RNA polymerase
C- DNA dependant RNA polymerase

d. A—DNA-dependant DNA polymerase
B-RNA-dependant RNA polymerase
C- RNA-cells dependant DNA-polymerase

19. Which of the following combinations in Griffiths experiments resulted in both live R cells and Live S cells of the pneumonia bacterium?
a. Live R type cells + Heat -killed S-Type cells
b. Heat -killed R type cells + Live S type cells
c. Heat – killed R type cells + Heat killed S type
d. All of the above.

20. Which of the following are the causes/ reasons of population explosion?
A) Increase in MR
B) Decrease in IMR
C) No starvation deaths in the populations
D) Decrease in MMR
E) Increase in IMR

a. A, C and D
b. A, C, D and F
c. B, C and E
d. B, C, D and F

21. Which of the following Assisted reproductive technologies(ART).Is the test tube baby programme ?
a. Gamete Intra- fallopian transfer (GIFT)
b. Intra-cytoplasmic sperm injection (ICSI)
c. In vitro fertilization (IVF) and embryo transfer (ET)
d. Zygote Intra-fallopian transfer (ZIFT)

22. The various steps of DNA fingerprinting techniques in the correct order.

1. Separation of DNA fragments of electrophoresis.
2. Digestion of DNA by restriction endonuclease.
3. Hybridization using labelled VNTR probe.
4. Isolation of DNA
5. Detection of hybridized DNA fragments by auto- radiography .
6. Transferring the separated DNA fragments to nitrocellulose membrane.

a. 6...2....1....4....3...5
b. 6...1...2....3....4...5
c. 2....1...4...6...3...5
d. 3...5...4...2..1...6

23. Mark the odd one in each of the following groups and select the correct option.

(A) Fimbriae, Labia minora, infundibulum, isthumus.
(B) Rete testis, Vasa efferentia, Epididymis, Ampulla
(C) Bulbourethral gland, Prostrate, Seminal vesicle, Seminiferous tubule
(D) Oogonia, Spermatogonia, Zygote, Ootid

a. A - Fimbriae, B- Ampulla, C- Prostrate, D- Zygote
b. A- Labia minora, B- Epididymis, C- Seminiferous tubules, D- Oogonia
c. A- Labia minora, B- Ampulla, C- Seminiferous tubule, D- Ootid
d. A- Infundibulum, B- Ampulla, C- Seminal vesicle, D- Zygote

24. Which of the following statements regarding sex determination is incorrect?

a. in fowls, the females are heterogametic (ZW) and the males are homogametic (ZZ)
b. in grasshoppers, the males are heterogametic (XY) and the females are homogametic (XX)
c. in drosophila, the males are heterogametic (XY) and the males are homogametic (XX)
d. in honey bees, the females are diploid (2n = 32 chromosomes) and the males are haploid (n = 16 chromosomes)

SECTION B

(Section-B has 25 to 48 questions. Attempt any 20 questions)

25-29 : Assertion Reasons.

a. Both Assertion and Reason are True, and Reason is the correct explanation of Assertion.
b. Both Assertion and Reason are true, but Reason is not the correct explanation of Assertion.
c. Assertion is true but Reason is false.
d. Both Assertion and Reason are false.

25. ASSERTION : Progesterone reaches its peak level in the luteal phase .
REASON; Corpus luteum that secretes progesterone is formed the ruptured Graafian follicle after ovulation.

a. Both Assertion and Reason are True, and Reason is the correct explanation of Assertion.
b. Both Assertion and Reason are true, but Reason is not the correct explanation of Assertion.
c. Assertion is true but Reason is false.
d. Both Assertion and Reason are false.

26. ASSERTION: If the tapetum is malfunctioned in an anther, the male gametophyte often becomes sterile.
REASON: Tapetum nourishes the developing embryo.

a. Both Assertion and Reason are True, and Reason is the correct explanation of Assertion.
b. Both Assertion and Reason are true, but Reason is not the correct explanation of Assertion.
c. Assertion is true but Reason is false.
d. Both Assertion and Reason are false.

27. ASSERTION : Addition or deletion of a single base in a cistron, produces an entirely new polypeptide.
REASON: Addition or deletion of a single base in a cistron leads to a change in the reading frame from a point of addition / deletion.

a. Both Assertion and Reason are True, and Reason is the correct explanation of Assertion.
b. Both Assertion and Reason are true, but Reason is not the correct explanation of Assertion.
c. Assertion is true but Reason is false.
d. Both Assertion and Reason are false.

28. ASSERTION: In Hershey- chase experiment, 32P got incorporated into the DNA, but not into the proteins.
REASON- DNA contains phosphorus in the nucleotide s, but proteins don't have phoshorus.

a. Both Assertion and Reason are True, and Reason is the correct explanation of Assertion.
b. Both Assertion and Reason are true, but Reason is not the correct explanation of Assertion.
c. Assertion is true but Reason is false.
d. Both Assertion and Reason are false.

29. ASSERTION: Except for Hepatitis -B, genital herpes and HIV infections, other sexually transmitted diseases, are completely curable.
REASON: The social stigma attached to STDS deter the infected persons from going for timely diagnosis.

a. Both Assertion and Reason are True, and Reason is the correct explanation of Assertion.
b. Both Assertion and Reason are true, but Reason is not the correct explanation of Assertion.
c. Assertion is true but Reason is false.
d. Both Assertion and Reason are false.

30. Identify whether each of the following statements is true T or F and select the correct options.

A) The finger like projections called fimbriae help in the collections of ovum into the fallopian tube following ovulation (true/false)
B) Endometrium undergoes cyclical changes and help in uterine movements (true/false)
C) Oxytocin necessary for parturition is secreted by the fully developed foetus and the placenta. (true/false)
D) The finger like projections that appear on the trophoblast following implantation are called chorionic villi (true/false)

a. A - F, B - F, C - T, D -T
b. A - T, B - F, C - F, D- T
c. A - T, B - F, C - T, D - F
d. A - F, B - T, C - F, D - T

31. Lactational amenorrhoea acts as a natural method of birth control, as
a. gonadotrophins are suppressed from being released.
b. there is no menstrual cycle during intense lactation
c. there is no ovulation and hence no fertilization
d. all of these

32. The inheritance pattern of a particular type of disorder is described below. Read the statements and identify the type of gene for the disorder

1. the trait appears more often in males than females
2. apparently normal, but carrier females pass on the disorder to 50% of their sons
3. females show the disorder only when both the parents have it
4. a father does not pass on the disorder to his sons

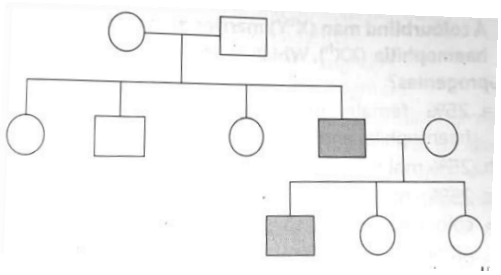
a. autosomal recessive
b. autosomal dominant
c. X- linked recessive
d. X- linked dominant

33. A couple has three children, two daughters, who are carriers of haemophilia and a son , who is normal. Arrive at the probable genotypes of the father and mother
    a. father XX and Mother XX^h
    b. father X^hY and Mother XX^h
    c. father X^hY and Mother XX
    d. father XY and Mother X^hX^h
34. In the Lac operon of E.coli , the I gene codes for
    a. inducer
    b. repressor
    c. lactase
    d. b-galactosidase
35. RNA viruses mutate faster because
    a. the 2'-OH group of ribonucleotides is reactive and makes RNA easily degradable.
    b. In RNA the 2'-OH group of ribonucleotides is less reactive and hence, RNA is more labile.
    c. RNA was first genetic material and used for transmission of genetic information.
    d. RNA can easily form double stranded regions along its length by forming hydrogen bonds.
36. Filiform apparatus in the embryo sac of an angiosperm is present at the micropylar tip of :-
    a. central cell
    b. egg cell
    c. synergids
    d. antipodals
37. Autogamy can occur in a chasmogamous flower if :-
    a. pollen matures before maturity of ovule.
    b. ovules matures before maturity of pollen .
    c. both pollen and ovule mature simultaneously.
    d. Both anther and stigma are of equal length.
38. The hormone which regulate the synthesis and secretion of androgens in human males.
    a. Hcg ,Hpl, progesterone
    b. Relaxin, Hcg, hpl
    c. Hcg, hpl,Oxytocin
    d. hpl, thyroxine, hcg
39. Crossing over during meiosis in a diploid individual is responsible for
    a. linkage of genes
    b. recombination of linked genes
    c. segregation of linked genes
    d. dominance of an allele
40. Absence of one sex chromososome , ie , monosomy of X-Chromosome in humans causes
    a. Turner 's syndrome , a male
    b. Klinefelter's syndrome a male
    c. Turners syndrome , a female
    d. Downs syndrome , a female
41. Taylor conducted his experiment to prove the semiconservative replication of DNA in the chromosomes on
    a. Escherichia coli
    b. Vicia fabia
    c. drosophila
    d. Bacteriophage
42. Point mutation involves
    a. Thalassemia and colour blindness
    b. Phenylketonuria and haemophilia
    c. sickle cell anaemia and thalassemia
    d. Colour blindness and haemophilia

43. Genetically different pollen grains of the same species land on the stigma in case of
   a. autogamy
   b. geitonogamy
   c. xenogamy
   d. cleistogamy

44. The outer most layer of maize endosperm is known as
   a. perisperm
   b. tapetum
   c. aleurone
   d. scutellum

45. Following pedigree chart show :-
   a. Recessive and autosomal
   b. Recessive and sex-linked
   c. Dominant and sex-linked
   d. Dominant and autosomal

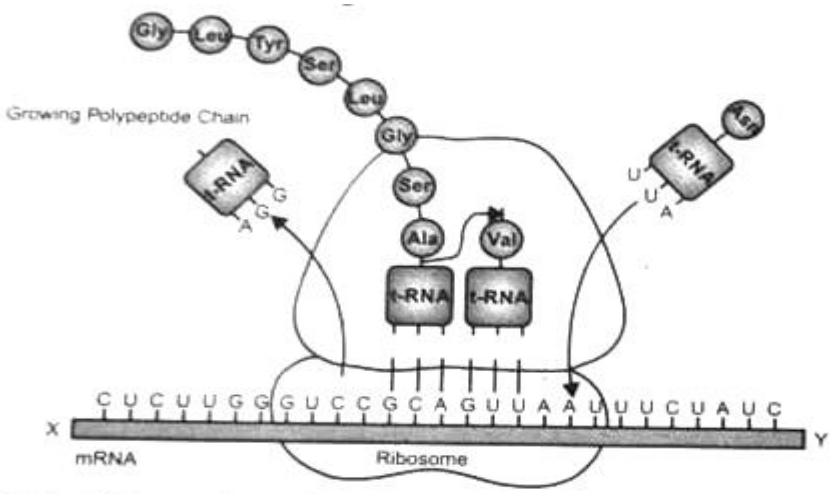


46. Match column I with Column II and select the correct option from the given codes :

	Column I		Column II
A.	Sigma factor	(i)	5′ – 3′
B.	Capping	(ii)	Initiation
C.	Tailing	(iii)	Termination
D.	Coding strand	(iv)	5′ end
		(v)	3′ end

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

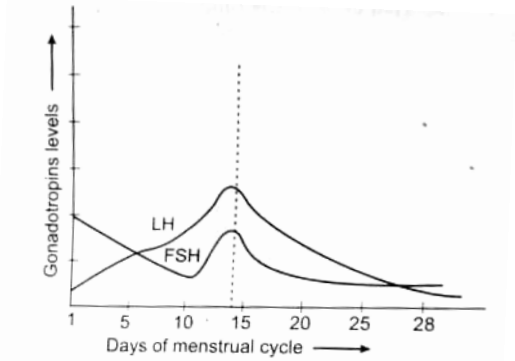
47. Refer to the given figure :-



Select the option which identifies polarity X and Y and DNA sequence coding for serine (P) and the anticodon for the same amino acid (Q).

	X	Y	P	Q
a.	3′	5′	TCA	UCA
b.	5′	3′	UUG	TCA
c.	3′	5′	UCA	TCA
d.	5′	3′	TCA	UCA

48. Study the graph carefully and correlate the hormones levels on:



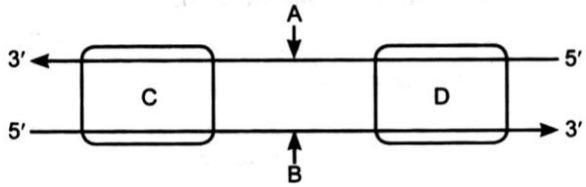
(i) 1-5 days
(ii) 12-14 days
(iii) 25-28 days (if the ovum is not fertilised).

a. (i) LH decreases and FSH increases
(ii) LH increases and FSH decreases
(iii) LH level maintained and FSH level increases
b. (i) LH increases and FSH decreases
(ii) LH decreases and FSH increases
(iii) LH level increases and FSH level maintained
c. (i) LH increases and FSH decreases
(ii) LH peaks and FSH peaks
(iii) Both FSH and LH decreases
d. (i) LH peaks and FSH peaks
(ii) LH increases and FSH decreases
(iii) LH level decreases and FSH level maintained

SECTION-C
CASE BASED QUESTIONS
(Section-C has 49 to 60 questions. Attempt any 10 questions)

Q49 – 60

49. A complete transcription unit is shown below :
Identify A, B, C and D in the figure.



(*a*) A – Coding strand, B – Template strand, C – Promoter, D – Terminator
(*b*) A – Template strand, B – Coding strand, C – Terminator, D – Promoter
(*c*) A – Template strand, B – Coding strand, C – Promoter, D – Terminator
(*d*) A – Coding strand, B – Template strand, C – RNA polymerase, D – Terminator

50. Mark the odd one in each of the following groups and select the correct option :-

A. UAA, UGG, UAG, UGA
B. 5S *r*RNA, *sn*RNA, *hn*RNA, *t*RNA
C. Har Gobind Khorana, Marshal Nirenberg, Severo Ochoa, Alec Jeffreys.
D. Promoter, Inducer, Operator, Terminator.

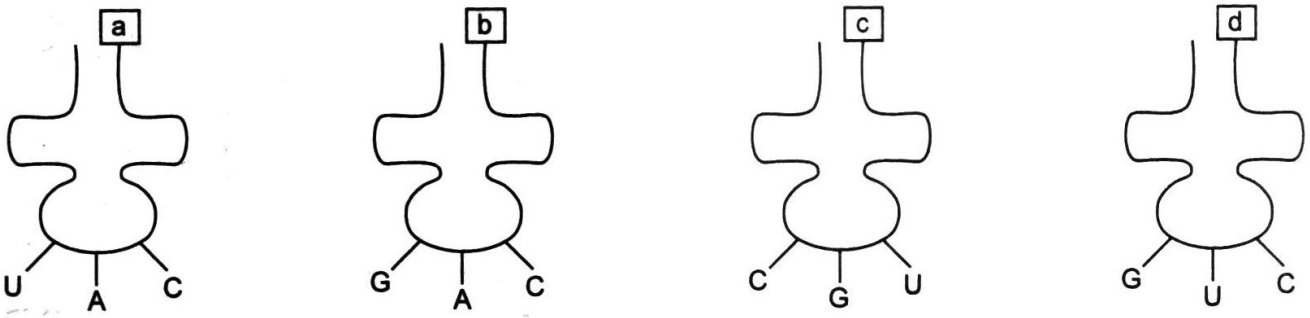
(*a*) A – UAG B – *t*RNA
C – Alec Jeffreys D – Operator
(*b*) A – UGG B – *hn*RNA
C – Alec Jeffreys D – Inducer
(*c*) A – UGG B – S*n*RNA
C – Severo Ochoa D – Inducer
(*d*) A – UAG B – *hn*RNA
C – Marshal Nirenberg D – Operator

Read the following passage and answer the questions that follow :-

In bacteria as well as in eukaryotes, there are three major types of RNAs, namely, (*i*) messenger RNA (*m*RNA), (*ii*) ribosomal RNA (*r*RNA) and (*iii*) transfer RNA (*t*RNA). All these three types of RNAs are necessary for synthesis of polypeptides in cells. The *m*RNA provides the template, the *t*RNA brings the amino acids as well as reads the codons on *m*RNAs for the amino acids and *r*RNA plays catalytic and structural roles during translation.

Given below are four amino acyl *t*RNAs along with their anticodons.

Study the diagram and answer the questions that follow:



51. The process by which the *t*RNA binds to a specific amino acid is

(*a*) amino-acylation of *t*RNA (*b*) translation

(*c*) transcription (*d*) reverse transcription

52. This process occurs in the _____ of a human cell

(*a*) Nucleus (*b*) Mitchondria

(*c*) Cytoplasm (*d*) Plasma membrane

53. Write the *m*RNA segment transcribed by the following segment of DNA.

3′ TACGTCCGTGAC 5′

5′ ATGCAGGCACTG 3′

(*a*) 5′ AUGCAGGCACUG 3′

(*b*) 5′ ATGCAGGCACTG 3′

(*c*) 5′ GTCACGGACGUA 3′

(*d*) 5′ CAGUGCCUGCAU 3′

54. The sequence of binding of the amino acyl *t*RNAs, (shown in the figure) to the *m*RNA transcribed in the question (*iii*), would be

(*a*) a-c-b-d (*b*) a-d-c-b

(*c*) a-b-d-c (*d*) a-c-d-b

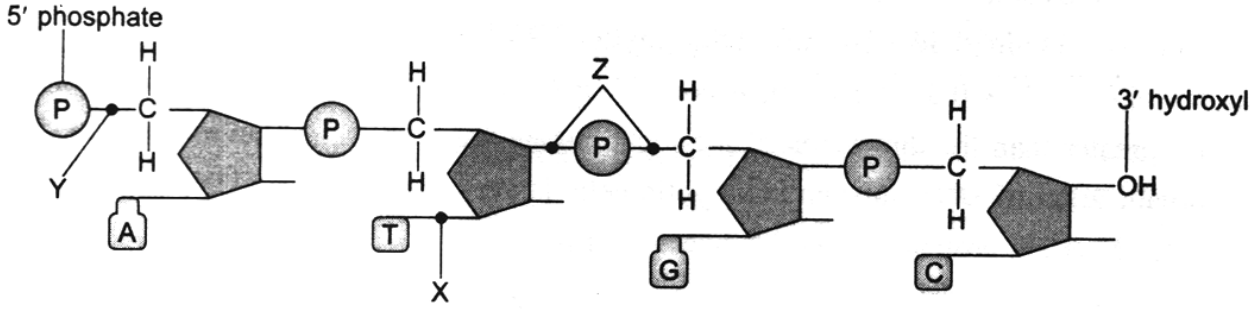
55. How many codons in the genetic code dictionary of 64 codons do not have *t*RNAs?

(*a*) 6 (*b*) 5

(*c*) 4 (*d*) 3

Read the following passage and answer the questions that follow :-

Study the diagram of a polynucleotide strand given below:



Three types of linkages X, Y and Z are shown in the above diagram.

Answer the following questions.

56. Linkage 'X' represents a A bond and leads to the formation of a B.
   (*a*) A. hydrogen bond, B. purine base
   (*b*) A. glycosidic bond, B. disaccharide
   (*c*) A. ester bond, B. nucleoside
   (*d*) A. glycosidic bond, B. nucleoside

57. A nucleoside differs from a nucleotide, as it lacks
   (*a*) a nitrogen base
   (*b*) a pentose sugar
   (*c*) a phosphate moiety
   (*d*) a hydroxyl group

58. Nucleic acids contain either ribose (RNA) or deoxyribose (DNA). Both these belong to a class of sugars, called
   (*a*) trioses
   (*b*) pentoses
   (*c*) tetroses
   (*d*) hexoses

59. The linkages Y and Z represent respectively
   (*a*) Y – hydrogen bond,
   Z – ester bond
   (*b*) Y – glycosidic bond,
   Z – phosphoester bond
   (*c*) Y – phosphoester bond,
   Z – phosphodiester bond
   (*d*) Y – phosphodiester bond,
   Z – phosphoester bond

60. In a polynucleotide strand, the nucleotides are linked together by
   (*a*) phosphodiester bond
   (*b*) phosphoester bonds
   (*c*) glycosidic bonds
   (*d*) hydrogen bonds